

Federal Railroad
Administration

Office of Safety



Accident Investigation Guidelines

General Compliance Manual
Part IV, Chapter 9

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FRA Accident Investigation Guidelines

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Foreword

The Secretary of Transportation, or an investigator authorized by the Secretary, has authority to investigate an accident or incident resulting in serious injury to an individual or to railroad property, occurring on the railroad line of a railroad carrier; and an accident or incident reported under 49 USC 20505. In carrying out an investigation, the Secretary or authorized investigator may subpoena witnesses, require the production of records, exhibits, and other evidence, administer oaths, and take testimony.

The purpose of an accident investigation is to promote safety in every area of railroad operations and reduce railroad-related accidents and incidents. To accomplish this objective, the FRA investigator must determine the root cause of the accident/incident. Understanding the root cause allows the railroad and/or FRA to implement proper remedial action to prevent similar future occurrences. This remedial action could range from repairing defective track to developing a new regulation or safety standard.

FRA generally investigates accidents and incidents meeting the following criteria:

- Any collision, derailment, or passenger train incident resulting in at least one fatality or serious injury to railroad passengers or crew members;
- Any railroad-related accident resulting in death to an on-duty railroad employee, including an employee of a contractor to a railroad, regardless of craft;
- Any highway-rail grade crossing accident resulting in:
 - Death to one or more persons in a commercial vehicle or school bus;
 - Serious injury to several persons transported by such vehicles;
 - Death to three or more persons in a private highway vehicle; or
 - No fatality, but involving a malfunction or failure of an active warning device which allegedly contributed to or caused the accident;
- All Amtrak accidents/incidents;
- Any train accident/incident with damages exceeding \$1 million;
- Any non-casualty train accident resulting in derailment of a locomotive and/or large number of cars, and extensive property damage;
- Any train accident/incident resulting in fire, explosion, or release of classified hazardous materials, especially if it exposed a community to these hazards or the threat thereof;
- Any nuclear train accident/incident;
- Any train incident involving run-away equipment, with or without locomotives;
- Any collision involving maintenance-of-way or hi-rail equipment;
- Any accident caused by failure of a locomotive or any part of a locomotive, or a person coming in contact with an electrically energized part that resulted in serious injury or death of one or more persons. (See 49 CFR 229.17 and 229.5(1)); and
- Any other train accident/incident likely to arouse considerable public interest.

General Guidelines

These guidelines explain the categories of accidents and incidents FRA investigates, and provide general guidance on the forms or formats used for each type of investigation. Detailed guidance and instructions are included in the sections of this chapter that are specific to the type of accident being investigated.

Factual accuracy during accident investigations is critical to the mission of the Office of Safety. Therefore, the Inspector-in-Charge (IIC) of the investigation must validate each fact against two or more sources whenever possible. If there are casualties to people other than railroad employees, at least one of those sources must be other than railroad reports (emergency responder records, hospital records, etc.)

The guidelines in this chapter and accompanying instructions for completing the required reports are comprehensive, but investigators should not consider them as all encompassing. Certain accidents, such as those involving passenger trains with multiple casualties, will require initiative on the part of the investigator preparing the reports. For example, the instructions for the narrative section of the F6180.39 report use a mock highway-rail grade crossing accident to illustrate how a narrative is prepared. This example does not require the preparer to identify the locations of the vehicle driver or passengers in the narrative. On the other hand, we would expect a passenger train accident report to identify the physical location on the train of passengers who suffered casualties.

The accidents assigned for investigation fall into one of the following categories:

1. Rail Equipment (collisions and derailments)
2. Highway-Rail Grade Crossing
3. Fatalities (Employee and Contractor)

Note: FRA does not use the proper names of persons involved in an accident. They are referenced in the factual reports by the category of person as specified in the “FRA Guide for Preparing Accident/Incident Reports.”

FRA assigns two other primary types of accident/incident investigations: (a) Locomotive Accidents (LAX) are reported on a form along with a specific word processing format, and (b) Hazardous Materials Incidents, which are reported using a memorandum format.

This chapter deals with rail equipment, highway-rail grade crossing, and fatality investigations. Contact the Headquarters MP&E Branch for guidance on Locomotive Accident Investigations, and the Headquarters Hazardous Materials Branch for guidance on Hazardous Materials Incident Investigations.

Assignments

Headquarters-Assigned Accidents - FRA Headquarters assigns about 100 accidents for investigation each calendar year, including **all** fatalities to railroad employees or contractors. All Headquarters accident investigation assignments are communicated to one of the eight FRA regions. The regions decide who will be assigned to the investigation, and who will be the IIC (Investigator-In-Charge). For Headquarters-assigned accidents, the IIC must be a Federal employee; participating state inspectors may **not** be assigned as the IIC.

Most Headquarters assignments result from a railroad's telephonic notification of an accident or incident to the National Response Center, as required by 49 CFR §225.9. For the most part, railroads are very conservative when considering this requirement, and many of the accidents reported telephonically don't meet the severity thresholds. For this reason, Headquarters reviews each accident to determine whether or not it should be assigned for investigation.

Regional Assigned Accidents Regions sometimes investigate rail equipment and highway-rail grade crossing accidents that were not assigned by Headquarters. These are commonly referred to as regional assigned accidents. Some of these accidents are from those reported to the National Response Center, others are accidents the region learned about during day-to-day business. *Regions are required to use form F6180.39a for these investigations and to enter the data into the web-database. Regions should NOT send hard copy reports, cover memos, attachments, etc., of regionally assigned accident reports to the Accident Analysis Branch in Headquarters.*

Roles and Responsibilities

Although performed infrequently, compared to other segments of our mission, accident investigations are our top priority. Regional managers may assign any Federal Inspector, Chief Inspector, or Specialist to be the IIC.

Regional managers are strongly encouraged to assign a subject matter expert to assist the IIC whenever specific causal factors are evident, and when certain kinds of information are critical in writing the investigation report. Following is a very brief description of the roles inspectors of the five disciplines and the Trespass and Highway-Rail Grade Crossing Division would play during the investigative process. It is by no means a comprehensive list of tasks inspectors perform during an accident investigation.

Hazardous Material Inspectors participate in investigations involving potential or actual hazardous material spills resulting in evacuations or casualties from a release of product. Under these circumstances, hazardous material inspectors typically assemble information relative to hazardous material transported in the train, including damages, shipping papers, product loss, and type of transport vehicles. Additional information typically includes evacuation details, environmental damages, and emergency response.

Motive Power & Equipment Inspectors get involved in investigations when equipment defects or track/train dynamics are suspected as causal or contributing factors in an accident or incident. They perform equipment inspections and monitor railroad test results to make this determination. Depending on their level of expertise, they may also review locomotive event recorder data to evaluate train handling.

Operating Practices Inspectors participate in accident/incident investigations when human factors are suspected. They review all pertinent records, operating rules and practices, and evaluate test results (such as drug/alcohol tests) to determine the reason for any human error. Crew resource management, work/rest cycles, and loss of situational awareness are examples of potential accident causal factors that OP inspectors may include in accident investigations. Depending on their level of expertise, they may also review locomotive event recorder data to evaluate train handling.

Signal & Train Control Inspectors observe railroad tests to determine the condition and operation of signals and train control systems which were in service at the time of the occurrence. Their investigations include an evaluation of the carrier's operating practices and rules, design of the carrier's signal system, stopping distances of trains involved, and adequacy of signal spacing for train speeds involved. If failure of active highway-rail grade crossing signals is suspected, S&TC Inspectors must perform this portion of an investigation.

Track Inspectors participate when track geometry conditions, rail conditions, track component failures, or track/train dynamics are suspected as causal or contributing factors. Track inspectors record and evaluate track geometry measurements, note the condition of rail or track components, and evaluate track/train dynamic forces.

Regional Trespass and Highway-Rail Grade Crossing Staff may be assigned to participate in highway-rail grade crossing accident investigations, either as the IIC or to assist. They review the accident history of the crossing, volume of traffic, the adequacy of present warning devices, and the potential for facilitating warning improvements.

Accident Reporting Forms and Formats

FRA uses the following forms and formats for initial, interim, and final reporting of accident investigations. There are requirements for interim 5-day reports for both the F6180.39 report and for Employee and Contractor Fatality Reports.

- ▶ **Form FRA 6180.41**, titled *Railroad Accident Notification*, is used to provide an initial report to other internal FRA employees. The form may be initiated by Headquarters, a region, or an inspector. The form is used for both **Headquarters and Regional** assignments. It is also used to disseminate information about any accident an inspector believes may be of interest to their region. An inspector-generated F6180.41 report often prompts a region to assign an accident for investigation. All F6180.41 reports must be forwarded to the HQ Accident Analysis Branch via e-mail *to the "FRA Accident Notification Group"*.

- ▶ **Form FRA F6180.39a**, titled *FRA 5-Day and Regional Factual Accident Report*, is a short version of the F6180.39 report *using fields 1 through 30a, 38, 39, and field 109 (Synopsis of the Accident)*. *The instructions for the data fields are the same as for the F6180.39 report, but a concise narrative is required in the "Synopsis" section. For 5-Day reports, fields 38 and 39 may be left blank. All fields must be populated for regional reports. In both cases, the data is captured in the web-database once the region performs the input.*
- ▶ **Form FRA F6180.39**, titled *Factual Railroad Accident Report*, is fed into a sophisticated web-database, and is used for the following three types of accidents: 1) Collisions, 2) Derailments, and 3) Highway-Rail Grade Crossing. As indicated earlier in this chapter, FRA refers to the first two types, collisions and derailments, as *Rail Equipment Accidents*.

The form is designed to accommodate accidents involving up to two trains and one highway-rail grade crossing accident, or any combination of the three. If there are more than two trains involved, the IIC uses the narrative section of the report to describe the circumstances. Most of the time, the IIC will only complete about 50 percent of the fields for a final report. Regions may require the IIC to use the web-database to enter their investigation results, or they may permit the IIC to use a paper or word processing form and have the database input performed by an administrative employee.

The form should also be viewed as a job aid for those involved in the investigation, because it provides a logic path for information collection, and much of the data collected mirrors the information FRA requires railroads to report on forms F6180.54, F6180.55a, and F6180.57. The instructions for the F6180.39 report also mirror the instructions for the railroad reports, which ensures FRA investigators and railroads use the same criteria to provide the information.

Note: Although some states that participate in the FRA railroad safety program have signed agreements to abide by FRA policies and guidelines during an accident investigation, state inspectors must not be assigned as the IIC for Headquarters assigned accidents. Further, state inspectors will not be granted access to the secure Form 39 database. Regional administrative employees who have been granted access to the secure Form 39 database must input data gathered by state inspectors.

- ▶ Employee Fatality (FE) and Contractor Fatality (CFE) Investigations are reported using a specific word processing format.
- ▶ All Headquarters-assigned accidents, including fatalities, require a cover memo and a regional administrator concurrence cover. The cover memo is typically prepared by the IIC, but the region may assign someone other than the IIC to prepare the memo based on information from the IIC. The regional administrator concurrence is a simple one-paragraph memorandum. The cover memo prepared to accompany a final fatality or F6180.39 report requires substantial detail, including but not limited to the information that follows.

Cover Memorandum Requirements

1. Any conflicts between FRA and railroad reports, and actions taken by the IIC to resolve them. FRA investigators should be cognitive that people often disagree on subjective issues such as cause. Unless the facts clearly prove the IIC is correct, they should not insist that the railroad change the cause. They must, however, make a strong argument for the reasons their probable cause statement disagrees with that reported by the railroad.
2. Remedial actions initiated by the railroad or other responsible person, or organization, which may prevent future accidents.
3. Citations by a public authority for failure to comply with state or local statutes, e.g. - Failure of a highway user to stop or yield at a highway-rail crossing at grade.
4. Any actions initiated by FRA because the cause or contributing factors resulted from non-compliance with Federal Railroad Safety Laws or Regulations. ***This includes any and all specific violation report numbers submitted by any inspector for any non-compliant condition found during the investigation, whether or not the non-compliance was a causal factor.***
5. Any other safety problem for which FRA has facilitated corrective action. ***(Reference item, above, regarding violation report numbers.)***
6. Any other safety problem for which FRA has facilitated corrective action.
7. Any conclusions and recommended actions that should be initiated by FRA.

List of Attachments

This list must not be part of the IIC cover memo, but must stand alone, be unnumbered, and be placed immediately after the F6180.39 or Fatality Report and just before the attachments. The attachments must be segregated and tabbed by using the following named categories:

1. ***Special Human Factors Reports: (e.g.- toxicology, Circadian Rhythm Report required by technical bulletin G-03-02, hours of duty records, operational testing records, rules attendance and other training and testing).***

NOTE: The circadian rhythm data specified by G-03-02 is required for all Headquarters assigned rail equipment, highway-rail, and employee fatality investigations. Regions may assign any inspector to collect the information, but a regional employee qualified in using the FAST model must input the data. Regions must also send both the FAST data file, and an electronic version of the completed form to the FRA Program Manager for Human Performance (currently Ralph Elston). Regions may contact the Program Manager for Human Performance if they need assistance in use and handling of the FAST data file.

2. ***Train Operating Information:*** (e.g.- crew, timetable, train consist, etc.), event recorder, method of operation including all special and dispatcher instructions, etc.
3. ***Train Mechanical Information:*** (e.g.- air brake inspections, locomotive inspections, locomotive safety devices (horn, bell, lights), alerting devices, EOT devices
4. ***Track, Structures and S&TC Information:*** (e.g.-class, tangents/curves, grade, GX signs, track chart), signal data records, length and width of GX, type and condition of crossing, and reference to any obstructions or information there were no obstructions.. If investigating a track caused accident, include “Factual Information Report on Rail Failures” and/or “Railroad Buckling Accident/Incident Study”, as appropriate.
5. ***Highway & Highway Vehicle Information:*** Name of street or highway, location (city, county, state), number of lanes, width and angle of crossing, types of protection, surface material, and reference to any obstructions or information there were no obstructions, description of highway vehicle, etc.
6. ***Reports of Interview:*** (railroad operating people first, other railroad people second, passengers or other casualties third, bystanders and non-injured passengers last).
7. ***Corresponding Reports:*** (e.g.-F6180.54, 55a, 57, 78, 81, 97 and 98; railroad incident reports, railroad damage reports, FRA inspection reports)
8. ***Reports from Public Entities:*** Cited in the report, such as newspaper reports, and those prepared by police, coroners, emergency responders, etc.;
9. ***Photos and Maps:***
 - a. ***Each photo must be embedded onto a separate page of either a Word or WordPerfect file, and must include relevant captions / labels. This must include time, date, location, and specifics (what are you taking a picture of) of each photo. If you are capturing geographic information, the label must orient the reader geographically (e.g. - view of the railroad at a distance of 150 feet, while traveling east on the highway; third locomotive unit of northbound train, etc.)***
 - b. ***Track Maps and Mapquest type maps are helpful and may be included, but a site specific hand drawn or computer aided map of the accident/incident area is required.***
10. ***Miscellaneous:*** Many accident reports have unique attributes that may not fit neatly in one of the categories specified above. This tabbed category is for those accidents, and is applicable only if necessary to support the accident investigation report. Examples are forensic passenger accident data, signal system failures, significant hazardous materials involvement, movable bridge structures, etc. If the event is significant enough, the “Miscellaneous” title should be replaced by each applicable category (e.g. - Signal & Train Control, Hazardous Materials or Forensic Passenger Data, etc.).

Review Process

- 1. The IIC is required to complete all relevant Job Aid checklists from the Accident Investigation Instructions. For example:***
 - a. All rail equipment accident reports require completion of Job Aids 2 & 3,***
 - b. Derailments also require completion of Job Aids 5, 7, & 9.***
 - c. Collisions also require completion of Job Aids 4 and 5.***
 - d. Highway-rail grade crossing accidents also require completion of Job Aid 8.***
 - e. Fatalities require completion of Job Aid 10 and, if applicable, Job Aid 11 (SOFA related).***
- 2. The F6180.39 report narrative section instructions (fields 109 and 110) are set-up as a series of checklists (bullets) and must used that way for review. The IIC is required to submit a copy of the narrative instructions, with hand-written checkmarks, indicating he or she has verified each of the facts referenced by the bullets, and has included the information in their narrative.***
- 3. The regional review people must inspect all the above checklists to ensure the IIC has used them correctly.***
- 4. Both the IIC and the regional review team must validate the cover memo against both the instructions on pages 5 and 6 of the guidelines, and also Job Aid 13, to ensure completeness.***
- 5. The IIC and the regional review people must validate each data field in the 39 report with any corresponding text in the narrative portion of the report to ensure consistency and factual accuracy. Examples: Fields 5 and 6 (date and time), must correspond with that information in the “Synopsis” section; field 28 (speed) must correspond with that information in the “Accident” section; fields 46-48 (casualties) must correspond with that information in both the “Synopsis” and the “Accident” sections, etc.***
- 6. The Regional Administrator concurrence memo which is sent to HQ with the complete report packet will include a statement that the associated 39 hard copy report was generated from the “Final Regional” report residing in the secure database.***

Communication Guidelines

When major, high profile accidents occur, headquarters staff will require continuing updates. A reliable means of communication must be established and maintained between Regional Management and the Accident Analysis Branch. Regional Management will designate a POC (Point-of-Contact). That individual must have a reliable, ready means of communication with both

the accident investigators and the Accident Analysis Branch, and will be the main information link between the Accident Analysis Branch or the duty officer, and the investigators.

The following communication guidelines pertain to the interaction between the regional accident point-of-contact (POC), and the inspector(s) initially assigned to the investigation. The regional POC may modify them at their discretion, but unless otherwise advised by the POC, these will govern:

1. At the halfway point if travel time exceeds 2 hours.
2. Immediately after arrival at the accident.
3. As directed by the regional coordinator (Point of Contact).
4. Whenever significant new facts are developed or the situation at the accident changes significantly.
5. Individual accident team members contact the inspector-in-charge (IIC) as directed by items 1 through 4, above. In the event the IIC is not available, they must contact the region POC directly.

External Organizations

During accident investigations, FRA investigators will almost always collaborate and share factual information with investigators from external organizations. Examples include, but are not limited to, railroad investigators, police and fire departments, and other state or local authorities and investigators. We also partner with states that participate in FRA activities, provided they have signed an agreement with the region to abide by FRA policies and guidelines.

Since this process is a sharing of factual information, FRA investigators do not perform interviews, or submit reports of interviews regarding this interaction. They should, however, obtain copies of any railroad or public reports, review them for conflicts with their own findings, and attach them to the cover memorandum written as part of the final report.

FRA has particular guidelines investigators should follow when interacting with the National Transportation Safety Board and the Occupational Safety and Health Administration, and during contacts with news media employees. These guidelines follow, and FRA investigators should contact their regional managers if there is any doubt regarding this interaction.

The National Transportation Safety Board (NTSB) is an independent agency charged with the responsibility to conduct accident investigations for all modes of transportation. They have considerable legal authority. FRA sometimes investigates accidents either concurrently or in conjunction with NTSB. So, it is important to understand our relationship with them.

If NTSB accident investigators appear on the scene during an investigation, the FRA representatives should offer full cooperation, keeping their regional administrator advised of all developments. NTSB investigations have priority over FRA investigations, but NTSB does not have the authority to preempt FRA.

The following are key points of FRA's memorandum of understanding with NTSB, first effective May 1975.

1. NTSB has responsibility for determining probable cause.

2. FRA has responsibility for investigating accidents to determine compliance with the existing rules, and necessity to amend existing rules or to issue new ones.
 3. Notification of all accidents reported to NTSB will be provided to the FRA by means of a daily written morning report, or more frequently if warranted on a case-by-case basis.
 4. NTSB and FRA may jointly participate in investigating the same accident. In such cases, the NTSB will assume control of activities during the on-scene investigation, including statements to the media.
 5. Upon completion of the on-scene investigation, appropriate responsibilities will revert to the individual agencies.
 6. Both agencies are to have full access to all factual data.
 7. Either party may withdraw from participation at any stage of the investigation.
 8. NTSB will be responsible for the public release of the final report resulting from joint investigative efforts.
 9. FRA will provide copies of all FRA investigative reports to NTSB, and vice versa.
 10. Advance copies of investigative reports will be provided by NTSB at least 5 days before final issuance.
 11. All operational interface between NTSB and FRA will be the responsibility of the Associate Administrator for Safety, or his designee.
- The key is to keep your regional management fully informed.

Occupational Health and Safety Administration

On March 14, 1978, FRA published a Federal Register notice (Vol. 43, No. 50, beginning on page 10583) preempting OSHA from applying their regulations in areas we (FRA) categorize, or define, as “railroad operations,” including preemption from conducting certain employee fatality investigations. FRA recognized, however, that OSHA currently is not precluded from exercising jurisdiction with respect to conditions not rooted in railroad operations; nor so closely related to railroad operations as to require regulations by FRA in the interest of controlling predominant operational hazards.

FRA also recognizes that OSHA investigators have specific expertise in some areas, and conducting concurrent fatality investigations often benefits both agencies. FRA confers jurisdiction to OSHA for the following:

- Means of egress from fixed facilities.
- General office environments.
- Confined space ventilation and safe work procedures.
- Personal protection equipment.
- Blood-borne pathogens.

Contacts With News Media

News media may approach field employees during an accident or incident investigation. Although FRA employees may NOT grant interviews, they may inform the news media of the following:

- The accident is being investigated by FRA;
- The cause has not yet been determined; and
- A public report of the investigation will be made available upon request.

Refer requests for further information to FRA's Office of Public Affairs, phone 202-493-6024.

The remainder of this chapter consists of detailed instructions for completing the reports specified above, the FRA Office of Safety's Guidelines for Conducting Interviews, the FRA Suggested Word List, and a series of job aids to assist FRA employees when they are involved in accident or incident investigations. Those involved in the investigative process should review the instructions and job aids carefully. Although they are performed infrequently, accident investigations and reports are one of FRA's top priorities.



U.S. Department
of Transportation
Federal Railroad
Administration

RAILROAD ACCIDENT NOTIFICATION

1. SUBMITTED BY:		
2. DATE	3. TIME	
4. NAME OF RAILROAD	5. LOCATION OF ACCIDENT	TIME AND DATE

6. METHOD OF OPERATION

7. TRAIN INFORMATION

	TRAIN #1	TRAIN #2	TRAIN #3
A. KIND OF TRAIN			
B. TRAIN NUMBER			
C. DIRECTION			
D. NUMBER OF LOCOMOTIVE (S)			
E. NUMBER OF CARS			
F. ESTIMATED SPEED			
G. EQUIPMENT DERAILED			

8. CASUALTIES

A. NUMBER KILLED	B. NUMBER SERIOUSLY INJURED	C. NUMBER SLIGHTLY INJURED
------------------	-----------------------------	----------------------------

9. PROBABLE CAUSE OF ACCIDENT

10. HAZARDOUS MATERIAL CARS DERAILED OR SIGNIFICANTLY DAMAGED

CAR TYPE	INIT. AND NO.	CARGO	FIRE, EXPLOSION, ETC.
A.			<input type="checkbox"/> YES <input type="checkbox"/> NO
B.			<input type="checkbox"/> YES <input type="checkbox"/> NO
C.			<input type="checkbox"/> YES <input type="checkbox"/> NO
11. NUMBER CARS DERAILED OR DAMAGED	12. POPULATED AREA <input type="checkbox"/> YES <input type="checkbox"/> NO	13. EVACUATION? <input type="checkbox"/> YES <input type="checkbox"/> NO	14. NO. PEOPLE EVACUATED

15. HIGHWAY-RAIL CROSSING ACCIDENT? <input type="checkbox"/> YES <input type="checkbox"/> NO	16. CROSSING WARNING	
17. TYPE OF MOTOR VEHICLE	18. CARGO	19. INTERSTATE <input type="checkbox"/> YES <input type="checkbox"/> NO

20. BRIEF DESCRIPTION OF ACCIDENT

F6180.41 Instructions

Initial written notification to the Accident Analysis Branch concerning an accident or incident will be done through the use of the Railroad Accident Notification form, FRA's F6180.41 (41) report. The 41 report must be forwarded to the Regional Management and to the "FRA Accident Notification Group" as soon as possible. This information is used to generate the Briefers that notify headquarters management and many other governmental entities about the accident or incident.

The 41 report consists of 20 numbered item fields. A brief explanation of each field is listed below:

ITEM 1 - Your name. Be sure to include your name.

ITEM 2 - The date you are making the report.

ITEM 3 - The time you are making the report.

ITEM 4 - The official alpha code of the railroad involved. If two or more railroads are involved, enter the code for the track owner first. If, for example, Amtrak derailed on CSX property, the entry would be CSX/ATK.

ITEM 5 - The name of the nearest city, town, state and the date & time of the incident.

ITEM 6 - Method Of Operation - the authority for the movement of trains in the accident area.

ITEM 7 - Train #1 - The train that initiated the event, or the only train involved in the accident. If the event is a train-to-train collision, enter the striking or offending train.
Train #2 - The second train involved in the accident. If the event is a train-to-train collision, enter the standing train, or the train that was operating under proper authority.

- A. Freight, Passenger, RCL, Work Train, etc.
- B. The number shown in the timetable or the train's symbol.
- C. Timetable direction for each train involved.
- D. Show the number of locomotives in each consist. If locomotive numbers are available, include them as well, i.e.: 3-SP5534, UP6698 & KCS 2344.
- E. Number of cars (loads/empties, tonnage, length) and caboose, if any.
- F. Estimated speed of each train.
- G. Show locomotive units and cars (i.e., 2 locomotive units, 5 cars). If you know articulated cars are involved, indicate so and list the number of platforms, e.g.- 3 articulated cars, 15 platforms.

ITEM 8 - A. Indicate number killed.
B. Indicate number injured.
C. Ignore on initial report.

ITEM 9 - The probable cause that you determined from your first observation or information. If cause is unknown, indicate where your and/or the railroad investigation is focusing.

NOTE: ITEMS 10-14 will **NOT** be used unless Hazardous Material (HM) cars are involved in the incident. However, when HM cars are in the train-although not involved-make note of that fact in the descriptive section (Item 20) of the report. Sometimes, an HM car not involved in the initial incident becomes involved during the rerailling process, requiring a headquarters update.

ITEM 10 - HM cars listed in this area have sustained significant damage and are probably responsible for an evacuation (Item 13) because of a fire, explosion, or a serious leak. Don't hold up the transmittal of the initial 41 report to headquarters waiting to capture all the details involved in this section. Remember, you can always transmit an updated 41 later.

ITEM 11 - Total number of hazardous cars derailed or damaged.

ITEM 12 - Are there people who could be affected by a hazardous materials release?

ITEM 13 - Were the people ordered evacuated?

ITEM 14 - Number of people evacuated.

ITEM 15 - Accidents involving motor vehicles at highway-rail grade crossings.

ITEM 16 - The kind of warning devices: cross bucks, flashing lights, gates.

ITEM 17 - Passenger car, van, farm tractor, semi-truck, pick-up truck, etc.

ITEM 18 - Name of commodity in vehicle involved.

ITEM 19 - Vehicle registration indicates interstate operation.

ITEM 20 - Describe the Accident. An explanation of "why" is not needed in this block. Show any additional information which does not fit in any of the blocks above, including FRA, State, or NTSB personnel at the scene or en route to the accident and their estimated time of arrival.

The information contained in the initial 41 report will oftentimes, need to be updated. When necessary to update the information conveyed in the initial 41, use the original 41 and show all updates in **bold**.

FRA 5-DAY AND REGIONAL FACTUAL RAILROAD ACCIDENT REPORT

FRA File # _____

Check block to indicate 5-Day or Regional Investigation	5-Day →	Regional →	
--	----------------	-------------------	--

1. Name of Railroad Operating Train #1	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
2. Name of Railroad Operating Train #2	2a. Alphabetic Code	2b. Railroad Accident/Incident No.
3. Name of Railroad Responsible for Track Maintenance <i>(single entry)</i>	3a. Alphabetic Code	3b. Railroad Accident/Incident No.
4. U.S. DOT-AAR Grade Crossing Identification Number	5. Date of Accident/Incident month day year	6. Time of Accident/Incident AM <input type="checkbox"/> PM <input type="checkbox"/>

7. Type of Accident/Incident <i>(single entry in code box)</i>	1. Derailment	4. Side Collision	7. Hwy-rail crossing	10. Explosion-detonation	13. Other <i>(describe in narrative)</i>	Code
	2. Head on collision	5. Raking collision	8. RR grade crossing	11. Fire/violent rupture		
	3. Rear end collision	6. Broken train collision	9. Obstruction	12. Other impacts		

8. Cars Carrying HAZMAT	9. HAZMAT Cars Damaged/Derailed	10. Cars Releasing HAZMAT	11. People Evacuated	12. Division
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13. Nearest City/Town	14. Milepost <i>(to nearest tenth)</i>	15. State Abbr.	Code	16. County
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17. Temperature (F) <i>(Specify if minus)</i>	° F	18. Visibility <i>(single entry)</i>	Code	19. Weather <i>(single entry)</i>	Code	20. Type of Track	Code
		1. Dawn 3. Dusk		1. Clear 3. Rain 5. Sleet		1. Main 3. Siding	
		2. Day 4. Dark		2. Cloudy 4. Fog 6. Snow		2. Yard 4. Industry	

21. Track Name/Number	22. FRA Track Class (1-9, X)	Code	23. Annual Track Density <i>(gross tons in millions)</i>	24. Time Table Direction	Code
				1. North 3. East	
				2. South 4. West	

25. Type of Equipment Consist <i>(single entry)</i>	1. Freight Train	4. Work train	7. Yard/switching	A. Spec. MoW Equip.	Code	26. Was Equipment Attended?	Code	27. Train Number/Symbol
	2. Passenger Train	5. Single Car	8. Light loco(s)			1. Yes 2. No		
	3. Commuter Train	6. Cut of cars	9. Maint./inspect. car					

28. Speed <i>(recorded speed, if available)</i>	Code	30. Method(s) of Operation <i>(enter code(s) that apply)</i>	30a. Remotely Controlled Locomotive?
R - Recorded E - Estimated	MPH	a. ATCS g. Automatic block m. Special instructions	0 = Not a remotely controlled operation
		b. Auto train control h. Current of traffic n. Other than main track rules	1 = Remote control portable transmitter
		c. Auto train stop i. Time table/train orders o. Positive train control	2 = Remote control tower operation
		d. Cab signals j. Track warrant control p. Other (specify in narrative)	3 = Remote control portable transmitter - more than one remote control transmitter
		e. Traffic control k. Direct traffic control	Code
		f. Interlocking l. Yard limits	

38. Primary Cause Code	39. Contributing Cause Code
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109. Synopsis of the Accident



FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #

1. Name of Railroad Operating Train #1		1a. Alphabetic Code		1b. Railroad Accident/Incident No.	
2. Name of Railroad Operating Train #2		2a. Alphabetic Code		2b. Railroad Accident/Incident No.	
3. Name of Railroad Responsible for Track Maintenance (single entry)		3a. Alphabetic Code		3b. Railroad Accident/Incident No.	
4. U.S. DOT-AAR Grade Crossing Identification Number		5. Date of Accident/Incident		6. Time of Accident/Incident	
		month day year		AM PM	
7. Type of Accident/Incident (single entry in code box)		1. Derailment		4. Side collision	
		2. Head on collision		5. Raking collision	
		3. Rear end collision		6. Broken train collision	
		7. Hwy-rail crossing		8. RR grade crossing	
		9. Obstruction		10. Explosion-detonation	
		11. Fire/violent rupture		12. Other impacts	
8. Cars Carrying HAZMAT		9. HAZMAT Cars Damaged/Derailed		10. Cars Releasing HAZMAT	
				11. People Evacuated	
				12. Division	
13. Nearest City/Town		14. Milepost (to nearest tenth)		15. State Abbr.	
				Code	
17. Temperature (F) (Specify if minus)		18. Visibility (single entry)		19. Weather (single entry)	
F		1. Dawn 3. Dusk 4. Dark		1. Clear 3. Rain 5. Sleet 2. Cloudy 4. Fog 6. Snow	
		Code		Code	
				20. Type of Track	
				1. Main 3. Siding 2. Yard 4. Industry	
21. Track Name/Number		22. FRA Track Class (1-9, X)		23. Annual Track Density (gross tons in millions)	
				Code	
				24. Time Table Direction	
				1. North 3. East 2. South 4. West	

OPERATING TRAIN #1

25. Type of Equipment Consist (single entry)		1. Freight Train		4. Work Train		7. Yard/switching		A. Spec. MoW Equip.		26. Was Equipment Attended?		27. Train Number/Symbol	
		2. Passenger Train		5. Single Car		8. Light loco(s)				Code		Code	
		3. Commuter Train		6. Cut of cars		9. Maint./inspect. car				1. Yes 2. No			
28. Speed (recorded speed, if available)		Code		30. Method(s) of Operation (enter code(s) that apply)				30a. Remotely Controlled Locomotive?					
R - Recorded		MPH		a. ATCS g. Automatic block m. Special instructions				0 = Not a remotely controlled operation					
E - Estimated				b. Auto train control h. Current of traffic n. Other than main track				1 = Remote control portable transmitter					
29. Trailing Tons (gross excluding power units)				c. Auto train stop i. Time table/train o. Positive train control				2 = Remote control tower operation					
				d. Cab signals j. Track warrant p. Other (specify in narrative)				3 = Remote control portable transmitter - more than one remote control transmitter					
				e. Traffic control k. Direct traffic Codes (s)				Code					
				f. Interlocking l. Yard limits									
31. Principal Car/Unit		a. Initial and Number		b. Position in Train		c. Loaded (yes/no)		32. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.					
(1) First involved (derailed, struck, etc.)								Alcohol Drugs					
(2) Causing (if mechanical, cause reported)								33. Was this consist transporting passengers? (Y/N)					
34. Locomotive Units		a. Head End		Mid Train		Rear End		35. Cars		Loaded		Empty	
		b. Manual		c.		d. Manual e. Remote		a. Freight b. Pass.		a. Freight b. Pass.		e. Caboose	
(1) Total in Train								(1) Total in Equip.					
(2) Total Derailed								(2) Total Derailed					
36. Equipment Damage This Consist		37. Track, Signal, Way, & Structure Damage				38. Primary Cause Code		39. Contributing Cause Code					
Number of Crew Members				Length of Time on Duty									
40. Engineers/Operators		41. Firemen		42. Conductors		43. Brakemen		44. Engineer/Operator		45. Conductor			
								Hrs: Mins:		Hrs: Mins:			
Casualties to:		46. Railroad		47. Train Passengers		48. Others		49. EOT Device?		50. Was EOT Device Properly Armed?			
Fatal								1. Yes 2. No		1. Yes 2. No			
Nonfatal								51. Caboose Occupied by Crew?		1. Yes 2. No			

OPERATING TRAIN #2

52. Type of Equipment Consist (single entry)		1. Freight Train		4. Work Train		7. Yard/switching		A. Spec. MoW Equip.		53. Was Equipment Attended?		54. Train Number/Symbol	
		2. Passenger Train		5. Single Car		8. Light loco(s)				Code		Code	
		3. Commuter Train		6. Cut of cars		9. Maint./inspect. car				1. Yes 2. No			
55. Speed (recorded speed, if available)		Code		57. Method(s) of Operation (enter code(s) that apply)				57a. Remotely Controlled Locomotive?					
R - Recorded		MPH		a. ATCS g. Automatic block m. Special instructions				0 = Not a remotely controlled operation					
E - Estimated				b. Auto train control h. Current of traffic n. Other than main track				1 = Remote control portable transmitter					
56. Trailing Tons (gross excluding power units)				c. Auto train stop i. Time table/train o. Positive train control				2 = Remote control tower operation					
				d. Cab signals j. Track warrant p. Other (specify in narrative)				3 = Remote control portable transmitter - more than one remote control transmitter					
				e. Traffic control k. Direct traffic Codes (s)				Code					
				f. Interlocking l. Yard limits									



FRA FACTUAL RAILROAD ACCIDENT REPORT

OPERATING TRAIN #2 (CONTINUED)

58. Principal Car/Unit		a. Initial and Number	b. Position in Train	c. Loaded	59. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.			Alcohol	Drugs		
(1) First involved (derailed, struck, etc.)											
(2) Causing (if mechanical, cause reported)					60. Was this consist transporting passengers? (Y/N)						
61. Locomotive Units	a. Head End	Mid Train		Rear End		62. Cars	Loaded		Empty		
		b. Manual	c. Remote	d. Manual	e. Remote		a. Freight	b. Pass.	c. Freight	d. Pass.	e. Caboose
(1) Total in Train						(1) Total in Equip. Consist					
(2) Total Derailed						(2) Total Derailed					
63. Equipment Damage This Consist		64. Track, Signal, Way & Structure Damage			65. Primary Cause Code			66. Contributing Cause Code			
Number of Crew Members						Length of Time on Duty					
67. Engineers/Operators	68. Firemen		69. Conductors		70. Brakemen		71. Engineer/Operator		72. Conductor		
							Hrs:	Mins:	Hrs:	Mins:	
Casualties to:	73. Railroad Employees		74. Train Passengers		75. Others		76. EOT Device?		77. Was EOT Device Properly Armed?		
Fatal							1. Yes 2. No		1. Yes 2. No		
Nonfatal							78. Caboose Occupied by Crew? 1. Yes 2. No				
Highway User Involved						Rail Equipment Involved					
79. Type						83. Equipment					
A. Auto C. Truck-trailer F. Bus J. Other Motor Vehicle Code						1. Train (units pulling) 3. Train (standing) 6. Light loco(s) (moving) Code					
B. Truck D. Pick-up truck G. School Bus K. Pedestrian						2. Train (units pushing) 4. Car(s) (moving) 7. Light loco(s) (standing)					
E. Van H. Motorcycle M. Other (spec.)						5. Car(s) (standing) 8. Other (specify in narrative)					
80. Vehicle Speed (est. mph at impact)		81. Direction (geographical) Code				84. Position of Car Unit in Train					
		1. North 2. South 3. East 4. West									
82. Position		Code				85. Circumstance Code					
1. Stalled on crossing 3. Moved over crossing						1. Rail equipment struck highway user. 2. Rail equipment struck by highway user					
2. Stopped on crossing 4. Trapped											
86a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? Code						86b. Was there a hazardous materials release by Code					
1. Highway user 2. Rail equipment 3. Both 4. Neither						1. Highway user 2. Rail equipment 3. Both 4. Neither					
86c. State here the name and quantity of the hazardous material released, if any.											
87. Type of Crossing Warning		1. Gates 4. Wig wags 7. 10. Flagged by crew		88. Signaled Crossing Warning		Code		89. Whistle Ban Code			
2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other (spec. in narr)		3. Standard FLS 6. Audible 9. Watchman 12. None		(See instructions for codes)				1. Yes 2. No 3. Unknown			
Code(s)											
90. Location of Warning Code				91. Crossing Warning Interconnected with Highway Signals Code		92. Crossing Illuminated by Street Lights or Special Lights Code					
1. Both sides 2. Side of vehicle approach 3. Opposite side of vehicle approach				1. Yes 2. No 3. Unknown		1. Yes 2. No 3. Unknown					
93. Driver's Age		94. Driver's Gender Code		95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train Code				96. Driver Code			
1. Male 2. Female				1. Yes 2. No 3. Unknown				1. Drove around or thru gate 4. Stopped on crossing 2. Stopped and then proceed 5. Other (specify in narrative) 3. Did not stop			
97. Driver Passed Standing Highway Vehicle Code				98. View of Track Obscured by (primary obstruction) Code							
1. Yes 2. No 3. Unknown				1. Permanent structure 3. Passing train 5. Vegetation 7. Other (specify in narrative) Code 2. Standing RR equipment 4. Topography 6. Highway vehicles 8. Not obstructed							
Casualties to:		Killed		Injured		99. Driver was Code		100. Was Driver in the Vehicle? Code			
						1. Killed 2. Injured 3. Uninjured		1. Yes 2. No			
101. Highway-Rail Crossing Users				102. Highway Vehicle Property (est. dollar damage)				103. Total Number of Highway-Rail Crossing Users (include driver)			
104. Locomotive Auxiliary Lights? Code						105. Locomotive Auxiliary Lights Operational? Code					
1. Yes 2. No						1. Yes 2. No					
106. Locomotive Headlight Illuminated? Code						107. Locomotive Audible Warning Sounded? Code					
1. Yes 2. No						1. Yes 2. No					



108. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC. INVOLVED.

A large, empty rectangular box with a black border, intended for drawing a sketch of the accident area. The box is currently blank.



109. SYNOPSIS OF THE ACCIDENT



110. NARRATIVE

FRA Factual Railroad Accident Report Instructions

Please note that Form FRA F6180.39a is intended for both 5-day Reports for HQ assigned accidents, and Regional assigned accidents. A limited number of items (1 through 30a, 38, 39, and 109 [Synopsis]) are used for these reports. Regional managers will advise the IIC regarding how much detail they are required to report in the synopsis section.

The complete version of Form FRA F6180.39 is used for **Headquarters assigned** rail-equipment and highway-rail grade crossing accidents. When completing this form, enter "N/A" for those items that **do not apply** to an accident, using care in describing trains or other on-track equipment that is the reporting responsibility of a railroad other than the railroad responsible for track maintenance. All items on **Final Reports** must have an entry; do not leave items blank. **If "none" is the proper response to an item** (for example, the number of cars releasing hazardous material), then enter "0," not "N/A."

Regardless of the whether you use form F6180.39 or F6180.39a, only the Inspector-In-Charge (IIC), or select people authorized by the regional administrator, should complete or edit the report(s) for any particular accident.

NOTE: Almost all of **items 1 through 107** correspond with the forms FRA F6180.54 and/or F6180.57 reports that railroads are required to submit for reportable accidents. Likewise, casualty information is required to be submitted on form FRA F6180.55a. The entries on this form should agree with the corresponding railroad entries. **If they don't**, the IIC must explain the variances, and what they did to resolve them, in a cover memo when they submit their **IIC Final Report**.

The limitations imposed by standardized reporting forms make it critical that the narrative portion of the report (**items 109 and 110**) provide additional information concerning those items that cannot be adequately described on the coded portions of the form. The wide variation in the causes and circumstances of accidents limits our ability to prepare a comprehensive list of examples.

Instructions for Completing Header Portion of Form

- FRA File #** Enter the accident control (file) number assigned by HQ. There is no requirement for the IIC to enter their ID number if they are submitting the information manually or using WordPerfect. In those cases, the region will enter the ID number when they enter the information using the Form 39 secure web database site.
1. **Name of Railroad Operating Train #1** - Enter the full name of the reporting railroad. A listing of current codes can be found in **Appendix A** of the FRA Guide for Preparing Accident/Incident Reports. **Note:** If there are two or more trains involved, **Operating Train #1** is the non-complying train or the train that initiated the accident, and **Operating Train #2** is the complying train. An exception to this rule is when there are two accidents involved in one event (two accidents, but the second accident happened because the first accident had already happened). In that event, the train involved in the first accident is listed as **Operating Train #1**, regardless of whether the train was in compliance.
 - 1a. **Alphabetic Code** - Enter the reporting railroad's alphabetic code found in Appendix A.
 - 1b. **Railroad Accident/Incident No.** - Enter the unique identifying number that the railroad operating Train #1 assigned for the accident/incident being reported. This information must be obtained from the railroad involved.
 2. **Name of Railroad Operating Train #2** - If another equipment consist was involved in the accident, enter the full name of the railroad operating that consist. If more than one other railroad had a consist involved, list only one name; include in the narrative portion of the form a reference to all railroads and the extent of their involvement. **Note:** If there are two or more trains involved, Operating Train #2 is the train **in compliance** with the rules, and Operating Train #1 is the **non-complying** train. An exception to this rule is when there are two accidents involved in one event (two accidents, but the second accident happened because the first accident had already happened). In that event, the train involved in the first accident is listed as **Operating Train #1**, regardless of whether the train was in compliance.

Instructions for Completing FRA Form F6180.39

Item Instructions

- 2a. **Alphabetic Code** - Enter the alphabetic code of the railroad identified in item 2, as found in Appendix A.
- 2b. **Railroad Accident/Incident No.** - Enter the reporting number used by the railroad shown in item 2 to identify this accident/incident.
3. **Name of Railroad Responsible for Track Maintenance** - Enter the name of the railroad responsible for maintaining the track on which the accident/incident occurred.
- 3a. **Alphabetic Code** - Enter the alphabetic code of the railroad identified in item 3.
- 3b. **Railroad Accident/Incident Number** - Enter the reporting number used by the railroad shown in item 3 to identify this accident/incident.
4. **U.S. DOT-AAR Grade Crossing Identification Number** - If the event being reported is a highway-rail crossing impact, enter the DOT-AAR crossing identification number. If an identification number has not been assigned to the crossing, enter "Not assigned". **Note:** The railroad responsible for the on-track equipment involved in the impact must also complete a Form FRA F 6180.57. This report must have the same report number as that used on Form FRA F 6180.54.
5. **Date of Accident/Incident** - Enter the date of the accident/incident in numbers. For example, June 27, 2003 would be shown as 06 27 2003.
6. **Time of Accident/Incident** - Enter the **local civil** time the accident/incident occurred and check the appropriate ("AM" or "PM") box. Do not use military time.
7. **Type of Accident/Incident** - Identify the first event in the accident/incident from the list of codes on the form. The same code is used for all reports filed for the accident. For example, if a highway-rail crossing accident results in a train derailment, and a second train collides with the derailed equipment, the code would be #7 (Hwy-rail crossing).
8. **Cars Carrying HAZMAT [Hazardous Material]** - If the equipment consist(s) for which this report is being prepared contained cars which are designated as transporting hazardous material, enter the total number of these cars, including residue cars. If there were no such cars in the consist(s), enter a "0".
9. **HAZMAT Cars Damaged/Derailed** - If the entry in item 8 is greater than or equal to 1, enter the total number of hazardous material cars that were damaged or derailed. If there are hazardous materials cars involved but none were damaged or derailed, enter "0"; if there were no hazardous materials cars in the train(s), enter "N/A". The number of cars in item 9 cannot exceed the number of cars listed in item 8.
10. **Cars Releasing HAZMAT [Hazardous Material]** - If any of the hazardous material cars counted in item 8 released any portion of its contents, including fumes, enter the count of these cars. If there are hazardous materials cars involved but none released contents, enter "0"; if there were no hazardous materials cars in the train(s), enter "N/A". This number cannot be greater than that shown in item 8. Describe the hazardous material released in the narrative by name as shown on the official shipping document for each car. (Note: Any release of hazardous material must also be reported **by the carrier** on DOT form F 5800.1--see 49 CFR 171.15 and 171.16 for details.)
11. **People Evacuated** - If the accident/incident resulted in an evacuation of the area because of an actual or a potential exposure to hazardous material, enter the number of persons evacuated. Precautionary evacuations and instances where it was later established that a release of hazardous material did not occur are still to be reported.

Instructions for Completing FRA Form F6180.39

Item Instructions

12. **Division** - Enter the full name of the division on which the accident occurred. If the railroad is not so divided, enter the word "System". In the event of a joint accident, the host railroad's division will apply.
13. **Nearest City/Town** - Enter the name of the nearest City/Town.
14. **Milepost** - If the accident occurred on a main line, branch line, or siding, enter the milepost number, to the nearest tenth of a mile, at the location of the accident. If mileposts are not used, enter "N/A".
15. **State Abbr.** - Enter the appropriate State abbreviation and code, from Appendix B of the FRA Guide for Preparing Accident/Incident Reports.
16. **County** - Enter the **full name** of the county or parish in which the accident occurred.
17. **Temperature** - Enter the temperature (Fahrenheit) at the accident site at the time of the accident. If the temperature was below zero, preface the temperature number with a minus (-) symbol.
18. **Visibility** - Select the most appropriate entry, and place in the code box. Make sure this entry does not contradict the time given in item 6. For example, if the time of the accident was 1:30 p.m., it would be incorrect to code the visibility as "Dawn".
19. **Weather** - Select the most appropriate weather condition at the time and location of the accident, and enter the code in the box provided.
20. **Type of Track** - Select the code that identifies the type of track on which the accident occurred, and enter it in the box provided. Branch lines should be reported as Main, code "1".
21. **Track Name/Number** - Enter the name or number used to identify the track on which the accident occurred. If it is a main track of a single-track line, enter "single main track".
22. **FRA Track Class** - Enter the class of track on which the reported consist was located at the time of the accident. Classes of track are defined in the Federal Track Safety Standards (49 CFR Part 213). Excepted track should be entered as Class "X". **Note:** The maximum track speed will not always be the same as the maximum authorized speed for the consist(s) involved, since there are other variables that may require a lower speed than that permitted by track standards.

Track Class	Maximum Speed	
	Freight Trains	Passenger Trains
X	10	Prohibited
1	10	15
2	25	30
3	40	60
4	60	80
5	80	90
6	110	110
7	125	125
8	160	160
9	200	200

23. **Annual Track Density** - If the accident occurred on a main track, enter the annual gross tonnage (in millions) over this track; otherwise, enter "N/A". This number will be provided by the railroad, and in cases where multiple main tracks are involved, the number may be the annual gross tonnage for the route rather than any particular track. Use the same number

Instructions for Completing FRA Form F6180.39

Item Instructions

that the railroad responsible for track maintenance enters in **item 23** of the F6180.54 submitted for this accident.

24. **Time Table Direction** - If the consist identified on this report was involved in a highway-rail grade crossing accident, either moving or temporarily stopped, enter the code which describes the time table or schedule direction. If the equipment consist was a car or a cut of cars standing on the track, enter "N/A". **If two or more consists are involved in the accident, items 27 and 54 will be used to describe the timetable or schedule direction.**

Operating Train #1 - Items 25 through 51

25. **Type of Equipment Consist** - Select the code that best identifies the consist for which this report is being prepared, and enter in the box provided. Be sure that this entry is consistent with the values given in **items 34 and 35**.

For example: the codes "1", "2", "3", "7", and "8" are used for consists that contain a locomotive unit. Therefore, line 1 of **item 34** must show at least one locomotive in a box. If the code for a freight train is used, then line 1 of **item 35** must show loaded and/or empty freight cars. If the consist is a single car or cut of cars, there cannot be locomotives shown in **item 34**, and there must be a car count shown in **item 35**. Many such comparisons exist; be sure to check the interrelationship of information contained in all items related to the equipment consist.

26. **Was Equipment Attended?** - If the equipment consist was attended by an employee enter "1"; otherwise, enter "2".
27. **Train Number/Symbol** - If the equipment consist can be identified by means of a train number or symbol, enter that train number or symbol. Otherwise, enter the number of the locomotive unit from which the engineer was controlling the consist. Follow the number or symbol with the time table or schedule direction (North, South, East, or West). If the consist for which this report is being prepared did not contain a locomotive, enter "N/A".
28. **Speed** - List the speed (mph) at which the consist was traveling at the time of its involvement in the accident. Enter "E" in the code box to indicate if this is estimated; or enter "R" for a recorded speed. If this consist was stopped, enter a speed of "0".
29. **Trailing Tons** - If the equipment consist reported on this form is a freight train, work train, etc., enter the gross tonnage, excluding locomotives, of the train. Enter "N/A" if the consist was a passenger train, light locomotive(s), car(s), or a locomotive handling cars in switching operations.
30. **Method(s) of Operation** - Identify the method(s) of railroad operation at the accident location by entering the appropriate code(s) in the boxes. **Please note** that although multiple entries **may** be required, prudence should be exercised to ensure that the code(s) **actually reflect a method of operation**. For example, "yard limits" reflects a method of operation on a main track, and should not be used to specify operations within the confines of a yard; and "special instructions" should not be used unless this is the specific operating authority for the track involved.

If an entry cannot be made using codes a through o, put a "p" in the first code box and specify the operational method used in the narrative.

- 30a. If this consist is NOT a part of a remote controlled operation or is NOT being controlled by a remote control locomotive (RCL), enter code "0". For accidents involving consists controlled by RCL, enter one of the following three available codes that best describes the type of remotely controlled operation involved:

- 1 - Remote control portable transmitter
- 2 - Remote control tower operation

Instructions for Completing FRA Form F6180.39

Item Instructions

3 - Remote control portable transmitter - more than one remote control transmitter.

The use of codes "1", "2" or "3" is not dependent upon whether the RCL operation caused or contributed to the accident, only that the RCL was in use. Further explanation can be provided in the narrative.

31. **Principal Car/Unit** - All numbers should be entered into blocks 31a through 31c.

31a. **Initial and Number** - In the upper box ("First Involved"), list the initial and number of the first locomotive or car in the consist being reported.

If the consist was moving at the time of the accident, and the accident was caused by a mechanical or an electrical failure on this consist (cause codes beginning with "E"), enter the initial and number of the car or locomotive having the defective component in the lower box ("Causing"). If a mechanical or electrical failure on a locomotive or car in this consist did not cause the accident, enter "N/A", **unless the consist involved was an on-track maintenance equipment movement. If the consist involved was an on-track maintenance equipment movement, enter OTE.** If OTE is entered, describe fully in the narrative section of the report.

The same entry will frequently appear in both upper and lower boxes, since the locomotive or car with the mechanical or electrical failure will also be the first involved. If the locomotive or car that caused the accident was entrained in a different consist than the one described in this report, do not identify it on the report for this consist. A reference to the locomotive or car causing the accident may be made in the narrative section of the report.

31b. **Position in Train** - In the upper box, enter the position within the consist of the locomotive unit or car identified in the upper box of **item 31a**. When the consist contains a locomotive, count from and include the first locomotive unit. If the consist was a moving cut of cars, count from the leading end of the consist. If the consist was a single locomotive or moving car, or an on-track maintenance equipment movement, enter "1". If the consist was a standing car or a standing cut of cars, enter "N/A".

If a locomotive unit or a car is identified in the lower box of **item 31a**, enter its position in the lower box. Use the procedure described above.

Note: When entering the position of the car or locomotive in either box, be sure that this value does not exceed the total count of the consist. This is determined by adding the total number of locomotives in line 1 of **item 34** to the total number of cars shown in line 1 of **item 35**.

31c. **Loaded** - When the entry in the upper box of **item 31a** identifies a car, indicate if this car was loaded or unloaded by entering "Yes" or "No" in the upper box. If either a locomotive or an on-track maintenance vehicle is identified in **item 31a**, enter "N/A". TOFC-COFC flatcars are to be reported as loaded if trailers or containers are positioned on them, regardless of whether the trailers or containers are loaded.

If a car is identified in the lower box of **item 31a**, indicate if this car was loaded or unloaded by entering "Yes" or "No" in the lower box. Otherwise, enter "N/A". TOFC-COFC flatcars are to be reported as loaded if trailers or containers are positioned on them, regardless of whether the trailers or containers are loaded.

32. **Railroad employees tested for drug or alcohol use** . If any employee(s) involved in the operation of this consist tested positive for alcohol usage in connection with this accident, enter the number of positive tests in the first block. If any employee(s) involved in the operation of this consist tested positive for drug usage in connection with this accident, enter the number of positive tests in the second block. If testing was performed and the results were negative, enter "0." If there were positive tests, but impairment is not reported as a cause of the accident, then provide a brief explanation in the narrative of the basis for this

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determination. You are required to identify all accidents/incidents where either Federal or employer-authorized tests were performed.

33. **Was this consist transporting passengers?** - Enter "Y" (for "Yes") if the consist being reported on was transporting passengers; otherwise enter "N" (for "No").

34. **Locomotive Units]** - On line 1 ("Total in Train"), enter in the appropriate box(es), the number of locomotive units in this consist. If there were no locomotives in this consist, enter "0" in each of the boxes.

For the locomotives shown in line 1, list on line 2 ("Total Derailed") the number of these that were derailed in the accident. Include locomotives that derailed following a collision, explosion-detonation, etc., as well as those accidents identified as derailments in item 7.

35. **Cars-** On line 1 ("Total in Equipment Consist"), enter in the appropriate box(es), the number of cars contained in the consist. A passenger car is considered loaded if it contains one or more passengers, crew members or other railroad employees. Enter "0" in all boxes if the consist did not contain cars.

For the cars shown in line 1, list on line 2 ("Total Derailed") the number of these that were derailed in the accident.

Note of Special Instruction: When the consist contains articulated car(s), the count for these is to be the number of platforms/units in such a car. This is necessary in order to maintain comparability of train lengths. The narrative section of the form is to contain a reference that articulated cars were included in the consist.

36. **Equipment Damage This Consist** - Enter the amount of reportable damage sustained by the equipment consist for which this report is being prepared. If this consist did not have reportable damage, enter "0". **The information for this item must be that reported by the railroad in item 36 of the F6180.54 report prepared for this consist.**

37. **Track, Signal, Way & Structure Damage** - The railroad responsible for maintaining the track on which the accident/incident occurred determines the cost of damages to track, signals, roadbed, track structures, etc. **The information for this item must be identical to that reported by the railroad responsible for track maintenance, in item 37 of the F6180.54 report prepared for this accident.**

38. **Primary Cause Code** - From the cause descriptions found in Appendix C of the FRA Guide for Preparing Accident/Incident Reports, enter the code number which best describes the cause of the accident. If none of the available causes is appropriate, enter "M599" and fully describe the circumstances in the narrative section.

Note: All reports by a single railroad for a single accident should use the same cause code. When multiple railroads are reporting the same accident, they should attempt to resolve any differences concerning the cause prior to reporting. When this cannot be accomplished, each railroad will identify what it considers to be the primary cause of the accident. **FRA Investigators have the same obligation. However, when differences cannot be resolved, the reasons must be fully discussed in a cover memo accompanying this report. The narrative section of the report must substantiate the causal conclusions reached by the investigator(s).**

39. **Contributing Cause Code** - If there were one or more contributing causes, enter the code for the foremost contributing cause. Otherwise, enter "N/A".

- 40-43. **Number of Crew Members** - Enter in the appropriate boxes the total number of crew members on the consist for which this report is being filed. If the item does not apply, enter "N/A". The operator of on-track maintenance machines is to be included in the "Engineer" count.

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- 44-45. **Length of Time on Duty** - Show the length of time that the engineer/operator and conductor in charge of the equipment consist had been on duty at the time the accident/incident occurred.
- 46-48. **Casualties to:** - Enter the total number of persons who sustained reportable injuries (fatalities and non-fatalities, railroad employees and train passengers, or other) while on board, or as a result of striking, being struck by, or who are otherwise hurt in connection with the operation of this consist. This would include injuries to individuals who have jumped from the consist prior to the accident. If none, enter "0".

Note: All nonfatal casualties, including those being reported as occupational illnesses, in the case of hazardous material releases, are to be included. Each casualty reported on this form, regardless of whether fatal or nonfatal, must be reported individually on Form FRA F 6180.55a using the same accident/incident report number in item 1b. Enter the number of fatal and nonfatal casualties to the railroad employees, train passengers, and others. **The information on this form should match the information from the F6180.55a report, so bear in mind that each railroad is required to report casualties to their own employees, even if those employees were injured by a consist operated by another railroad.**

49. **EOT Device?** - If the equipment consist was equipped with an end-of-train device as specified in 49 CFR Part 232, enter "1"; otherwise, enter "2".
50. **Was EOT Device Properly Armed?** - If the EOT Device was armed and tested in compliance with 49 CFR Part 232, enter "1"; otherwise, enter "2". If "2" is entered, explain in the narrative section of the report.
51. **Caboose Occupied by Crew?** - If the equipment consist included a caboose which was occupied by a train crew member at the time of the accident/incident, enter "1"; otherwise, enter "2".

Operating Train #2 - Items 52 through 78

Note: If only one train is involved, do not complete this section.

52. **Type of Equipment Consist** - Select the code that best identifies the consist for which this report is being prepared, and enter in the box provided. Be sure that this entry is consistent with the values given in **items 61 and 62**.
- For example: the codes "1", "2", "3", "7", and "8" are used for consists that contain a locomotive unit. Therefore, line 1 of **item 61** must show at least one locomotive in a box. If the code for a freight train is used, then line 1 of **item 62** must show loaded and/or empty freight cars. If the consist is a single car or cut of cars, there cannot be locomotives shown in **item 61**, and there must be a car count shown in **item 62**. Many such comparisons exist; be sure to check the interrelationship of information contained in all items related to the equipment consist.
53. **Was Equipment Attended?** - If the equipment consist was attended by an employee enter "1"; otherwise, enter "2".
54. **Train Number/Symbol** - If the equipment consist can be identified by means of a train number or symbol, enter that train number or symbol. Otherwise, enter the number of the locomotive unit from which the engineer was controlling the consist. Follow the number or symbol with the timetable or schedule direction (North, South, East, or West). If the consist for which this report is being prepared did not contain a locomotive, enter "N/A".
55. **Speed** - List the speed (mph) at which the consist was traveling at the time of its involvement in the accident. Enter "E" in the code box to indicate if this is estimated; or enter "R" for a recorded speed. If this consist was stopped, enter a speed of "0".

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56. **Trailing Tons** - If the equipment consist reported on this form is a freight train, work train, etc., enter the gross tonnage, excluding locomotives, of the train. Enter "N/A" if the consist was a passenger train, light locomotive(s), car(s), or a locomotive handling cars in switching operations.
57. **Method(s) of Operation** - Identify the method(s) of railroad operation at the accident location by entering the appropriate code(s) in the boxes. **Please note** that although multiple entries may be required, prudence should be exercised to ensure that the code(s) actually reflect a method of operation. For example, "yard limits" reflects a method of operation on a main track, and should not be used to specify operations within the confines of a yard; and "special instructions" should not be used unless this is the specific operating authority for the track involved. If an entry cannot be made using codes "a" through "o", put a "p" in the first code box and specify the operational method used in the narrative section of the report.
- 57a. If this consist is NOT a part of a remote controlled operation or is NOT being controlled by a remote control locomotive (RCL), enter code "0". For accidents involving consists controlled by RCL, enter one of the following three available codes that best describes the type of remotely controlled operation involved:
- 1 - Remote control portable transmitter
 - 2 - Remote control tower operation
 - 3 - Remote control portable transmitter - more than one remote control transmitter.

The use of codes "1", "2" or "3" is not dependent upon whether the RCL operation caused or contributed to the accident, only that the RCL was in use. Further explanation can be provided in the narrative.

58. **Principal Car/Unit** - All numbers should be entered into blocks 58a through 58c.
- 58a. **Initial and Number** - In the upper box ("First Involved"), list the initial and number of the first locomotive or car in the consist being reported.
- If the consist was moving at the time of the accident, and the accident was caused by a mechanical or an electrical failure on this consist (cause codes beginning with "E"), enter the initial and number of the car or locomotive having the defective component in the lower box ("Causing"). If a mechanical or electrical failure on a locomotive or car in this consist did not cause the accident, enter "N/A", **unless the consist involved was an on-track maintenance equipment movement. If the consist involved was an on-track maintenance equipment movement, enter OTE.** If OTE is entered, describe fully in the narrative section of the report.

The same entry will frequently appear in both upper and lower boxes, since the locomotive or car with the mechanical or electrical failure will also be the first involved. If the locomotive or car that caused the accident was entrained in a different consist than the one described in this report, do not identify it on the report for this consist. A reference to the locomotive or car causing the accident may be made in the narrative portion of the report.

- 58b. **Position in Train** - In the upper box, enter the position within the consist of the locomotive unit or car identified in the upper box of **item 58a**. When the consist contains a locomotive, count from and include the first locomotive unit. If the consist was a moving cut of cars, count from the leading end of the consist. If the consist was a single locomotive or moving car, enter "1". If the consist was a standing car or a standing cut of cars, enter "N/A".

If a locomotive unit or a car is identified in the lower box of **item 58a**, enter its position in the lower box. Use the procedure described above.

Note: When entering the position of the car or locomotive in either box, be sure that this value does not exceed the total length of the consist. This is determined by adding the total

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number of locomotives in line 1 of **item 61** to the total number of cars shown in line 1 of **item 62**.

- 58c. **Loaded** - When the entry in the upper box of **item 58a** identifies a car, indicate if this car was loaded or unloaded by entering "Yes" or "No" in the upper box. If either a locomotive or an on-track maintenance vehicle is identified in **item 58a**, enter "N/A". TOFC-COFC flatcars are to be reported as loaded if trailers or containers are positioned on them, regardless of whether the trailers or containers are loaded.

If a car is identified in the lower box of **item 58a**, indicate if this car was loaded or unloaded by entering "Yes" or "No" in the lower box. Otherwise, enter "N/A". TOFC-COFC flatcars are to be reported as loaded if trailers or containers are positioned on them, regardless of whether the trailers or containers are loaded.

59. **Railroad employees tested for drug or alcohol use** - If any employee(s) involved in the operation of this consist tested positive for alcohol usage in connection with this accident, enter the number of positive tests in the first block. If any employee(s) involved in the operation of this consist tested positive for drug usage in connection with this accident, enter the number of positive tests in the second block. If testing was performed and the results were negative, enter "0." If there were positive tests, but impairment is not reported as a cause of the accident, then provide a brief explanation in the narrative of the basis for this determination. You are required to identify all accidents/incidents where either Federal or employer-authorized tests were performed.

60. **Was this consist transporting passengers?** - Enter "Y" (for "Yes") if the consist being reported on was transporting passengers; otherwise enter "N" (for "No").

61. **Locomotive Units** - On line 1 ("Total in Train"), enter in the appropriate box(es) the number of locomotive units in this consist. If there were no locomotives in this consist, enter "0" in each of the boxes.

For the locomotives shown in line 1, list on line 2 ("Total Derailed") the number of these that were derailed in the accident. Include locomotives that derailed following a collision, explosion-detonation, etc., as well as those accidents identified as derailments in item 7.

62. **Cars** - On line 1 ("Total in Equipment Consist"), enter in the appropriate box(es) the number of cars contained in the consist. A passenger car is considered loaded if it contains one or more passengers. Enter "0" in all boxes if the consist did not contain cars.

For the cars shown in line 1, list on line 2 ("Total Derailed") the number of these that were derailed in the accident.

Note of Special Instruction: When the consist contains articulated car(s), the count for these is to be the number of platforms/units in such a car. This is necessary in order to maintain comparability of train lengths. The narrative section of the form is to contain a reference that articulated cars were included in the consist.

63. **Equipment Damage This Consist** - Enter the amount of reportable damage sustained by the equipment consist for which this report is being prepared. If this consist did not have reportable damage, enter "0". **The information for this item must be that reported by the railroad in item 36 of the F6180.54 report prepared for this consist.**

64. **Track, Signal, Way & Structure Damage** - The railroad responsible for maintaining the track on which the accident/incident occurred determines the cost of damages to the track, signals, roadbed, track structures, etc. **The information for this item must be identical to that reported by the railroad responsible for track maintenance, in item 37 of the F6180.54 report prepared for this accident, and also the information report in item 37 of this report.**

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65. **Primary Cause Code** - From the cause descriptions found in Appendix C of the FRA Guide for Preparing Accident/Incident Reports, enter the code number which best describes the cause of the accident. If none of the available causes is appropriate, enter "M599" and fully describe the circumstances in the narrative section of the report.

Note: All reports by a single railroad for a single accident should use the same cause code. When multiple railroads are reporting the same accident, they should attempt to resolve any differences concerning the cause prior to reporting. When this cannot be accomplished, each railroad will identify what it considers to be the primary cause of the accident. **FRA Investigators have the same obligation. However, when differences cannot be resolved, the reasons must be fully discussed in a cover memo accompanying this report. The narrative section of the report must substantiate the causal conclusions reached by the investigator(s).**

66. **Contributing Cause Code** - If there were one or more contributing causes, enter the code for the foremost contributing cause. Otherwise, enter "N/A".

- 67-70. **Number of Crew Members** - Enter in the appropriate boxes the total number of crew members on the consist for which this report is being filed. If the item does not apply, enter "N/A". The operator of on-track maintenance machines is to be included in the "Engineer" count.

- 71-72. **Length of Time on Duty** - Show the length of time that the engineer/operator and conductor in charge of the equipment consist had been on duty at the time the accident/incident occurred.

- 73-75. **Casualties to:** - Enter the total number of persons who sustained reportable injuries (fatalities and non-fatalities, railroad employees and train passengers, or other) while on board, or as a result of striking, being struck by, or who are otherwise hurt in connection with the operation of this consist. This would include injuries to individuals who have jumped from the consist prior to the accident. If none, enter "0".

Note: All nonfatal casualties, including those being reported as occupational illnesses, in the case of hazardous material releases, are to be included. Each casualty reported on this form, regardless of whether fatal or nonfatal, must be reported individually on Form FRA F 6180.55a using the same accident/incident report number in item 1b. Enter the number of fatal and nonfatal casualties to the railroad employees, train passengers, and others. **The information on this form must match the information from the F6180.55a report, so bear in mind that each railroad is required to report casualties to their own employees, even if those employees were injured by a consist operated by another railroad.**

76. **EOT Device?** - If the equipment consist was equipped with an end-of-train device as specified in 49 CFR Part 232, enter "1"; otherwise, enter "2".

77. **Was EOT Device Properly Armed?** - If the EOT Device was armed and tested in compliance with 49 CFR Part 232, enter "1"; otherwise, enter "2". If "2" is entered, explain in the "Analysis and Conclusions" portion of the narrative section.

78. **Caboose Occupied by Crew?** - If the equipment consist included a caboose which was occupied by a train crew member at the time of the accident/incident, enter "1"; otherwise, enter "2".

Highway User Involved (items 79 through 107)

Note: Use this section only if the accident is a highway-rail grade crossing accident. Otherwise, do not complete this section.

79. **Type [of Highway User Involved]** - Select the code that best identifies the type of highway user involved in the accident/incident. **Note:** If a pedestrian is identified in this item, then items 80, 81, 82, 84, and 86(a, b, and c) are to be coded "N/A".

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80. **Vehicle Speed [of Highway User Involved]** - List the estimated speed (mph) that the highway user was traveling at the time of impact. If the highway user was not a vehicle, enter "N/A". If the vehicle was stopped on the crossing at the time of impact, enter "0".
81. **Direction [of Highway User Involved]** - Select the code that best describes the geographical direction in which the highway user was moving, and enter it in the box provided. If the highway user was stopped, identify the intended direction of travel. **Note:** It is possible in some circumstances for the geographical direction of the highway user to be the same as the time table direction of the railroad consist given in item 24, 27, or 54.
82. **Position [of the Highway User Involved]** - Select the code that best describes the position of the highway user at the time of impact, and enter in the code box. **Note:** If the highway vehicle was stopped or stalled on the crossing at the time of impact, the speed given in **item 80** must be "0".
83. **Equipment [Rail Equipment Involved]** - Select the code that best identifies the railroad equipment consist involved in the accident/incident and enter it in the box provided. (See definitions of types of rail equipment given in Chapter 2 of the FRA Guide for Preparing Accident/Incident Reports.) Note that on-track work equipment such as ballast tampers are classified as cars and therefore, should be identified by using code "4" or "5". When completing this item, pay particular attention to its relationship to other items on the form to avoid contradictions. Some examples of contradictory responses are as follows:
- a. If the description of a railroad equipment includes a reference to "pulling", "pushing", or "moving", then train speed ("Consist Speed") in **item 28 or 55** cannot be "0".
 - b. If the description states that the consist was "standing", then speed in **item 28 or 55** must be "0", and **item 85** cannot indicate that the rail equipment struck the highway user.
 - c. If a train is identified, there must be a count of the number of locomotives given in **item 34 or 61**. If the equipment consist was a single car or cut of cars, then **item 34 or 61** must be "0", and the count of cars must be entered in **item 35 or 62**.
84. **Position of Car Unit in Train [Rail Equipment Involved]** - Identify the position within the consist of the first locomotive unit or car that struck or was struck by the highway user. The position is determined by counting from (and including) the leading locomotive unit or car to the position of the first car or locomotive involved in the accident. The leading unit is the first car or locomotive to enter the crossing, regardless of the location of the locomotive(s). For example, in a pushing movement involving a cut of cars and a single locomotive, the count would begin from the car that first entered the crossing.
- Note of Special Instruction:** When the consist contains articulated car(s), the count for these is to be the number of platforms/units in such a car. This is necessary in order to maintain comparability of train lengths. The narrative section of the form is to contain a reference that articulated cars were included in the consist.
- Note:** If a single railroad car or locomotive was involved, or if the railroad consist struck the highway user (as shown in **item 85**), then the entry in this item must be "1".
85. **Circumstance [Rail Equipment Involved]** - Specify whether the railroad consist struck the highway user or was struck by the highway user. If the railroad equipment struck the highway user, be sure that **item 83** does not refer to "standing" equipment, and that the speed of the on-track equipment is given in **item 28 or 55**. If the highway user struck the railroad consist, be sure that the estimated speed of the highway vehicle given in **item 80** is greater than "0" and that the position of the highway user was coded "3" in **item 82**.

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- 86a. **Was the highway user and/or rail equipment involved in the impact transporting hazardous materials?** - Enter the code that identifies whether or not the rail equipment and/or the highway user was transporting hazardous material as cargo at the time of the impact. For the rail equipment, this includes any car containing hazardous material cargo within the consist, regardless of location, but not generally the locomotive or on-track equipment because diesel fuel or gasoline used by the locomotive and fuses carried in the locomotive or on-track equipment are not considered to be cargo. Highway users are to be identified only when the hazardous material is being transported as cargo; the gasoline or diesel fuel used by the vehicle's engine is not considered to be cargo.
- 86b. **Was there a hazardous materials (HAZMAT) release by** - Enter the code into the box that shows if there was a HAZMAT release by the highway user and/or rail equipment. If there was no HAZMAT release by either of these, enter the code for "neither". A release of gasoline or diesel fuel used by the vehicle's engine is not considered a HAZMAT release for the purposes of this item. (Please describe such occurrences in the narrative.)
- 86c. **State here the name and quantity of the hazardous material released, if any** - Enter the name of the hazardous material released, followed by the quantity released. State the measure, for example, 50 gallons or 20 tons. Describe the hazardous material released in the narrative by name or the Standard Transportation Commodity Code (STCC). (Note: Any release of hazardous material must also be reported on DOT form F 5800.1--see 49 CFR 171.15 and 171.16 for requirements.)
87. **Type of Crossing Warning** - Identify the warning devices by entering the appropriate code(s) in the box(es). For codes "2" and "3", "FLS" means "flashing light signal". Enter a code of "5" ("Highway Traffic Signals") whenever such a signal is present at the crossing site and is used for controlling highway traffic over the crossing.
88. **Signaled Crossing Warning** - Only if Codes 1-6 in item 87 (Type of Crossing Warning) are selected, enter in this item the status of the warning devices at the crossing at the time of impact, using the following:
1. Provided minimum 20-second warning.
 2. Alleged warning time greater than 60 seconds.
 3. Alleged warning time less than 20 seconds.
 4. Alleged no warning.
 5. Confirmed warning time greater than 60 seconds.
 6. Confirmed warning time less than 20 seconds.
 7. Confirmed no warning.
- If status code 5, 6 or 7 was entered, you must append a code from the following:
- A. Insulated rail vehicle.
 - B. Storm/lightning damage.
 - C. Vandalism.
 - D. No power/batteries dead.
 - E. Devices down for repair.
 - F. Devices out of service.
 - G. Warning time greater than 60 seconds attributed to accident-involved train stopping short of the crossing, but within track circuit limits, while warning devices remain continuously active with no other in-motion train present.
 - H. Warning time greater than 60 seconds attributed to track circuit failure (e.g., insulated rail joint or rail bonding failure, track or ballast fouled).
 - J. Warning time greater than 60 seconds attributed to other train/equipment within track circuit limits.
 - K. Warning time less than 20 seconds attributed to signals timing out before train's arrival at the crossing/island circuit.
 - L. Warning time less than 20 seconds attributed to train operating counter to track circuit design direction.

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- M. Warning time less than 20 seconds attributed to train speed in excess of track circuit's design speed.
 - N. Warning time less than 20 seconds attributed to signal system's failure to detect train approach.
 - P. Warning time less than 20 seconds attributed to violation of special train operating instructions.
 - R. No warning attributed to signal system's failure to detect the train.
 - S. Other cause(s). Explain in Narrative Description.
- Note: If the crossing site was not protected by train-activated warning devices, enter "N/A".

89. **Whistle Ban** - Enter the code which indicates whether or not there was a whistle ban in effect and observed at the time of the accident/incident.
90. **Location of Warning** - Select the code that identifies the location of the crossing warnings shown in **item 87**, and enter it in the code box. If there was no protection at the crossing, enter "N/A"; and enter a code of "12" in **item 87** for "None" (i.e., no warning).
91. **Crossing Warning Interconnected with Highway Signals** - If highway traffic signals within 500 feet of the crossing site are interconnected with the train detection circuitry, such that they restrict highway users from the crossing whenever a rail consist occupies or is about to occupy the crossing, enter "1".

If the highway traffic signals on the approach to the crossing are within 500 feet of the crossing but are not interconnected with the train detection circuitry, enter "2".

Enter "3" in the code box when it is not known whether the highway traffic signals are interconnected. If highway signals are not present within 500 feet of the crossing, enter "N/A".

Note: Item 87 identifies warning devices actually present at, or in the near vicinity of, the crossing. Therefore, it is possible to show highway traffic signals interconnected with train detection circuitry in this item, but not to enter a code of "5" in **item 87**.

92. **Crossing Illuminated by Street Lights or Special Lights** - If street lights or other special lights used to illuminate the crossing site were on at the time of the accident/incident, enter "1". If there were no such lights or if they were not illuminated at the time of the accident, enter "2".
93. **Driver's Age** - Enter the age of the driver. This block is optional; however, be as diligent as possible when completing this block. If the highway user was a pedestrian, please provide age, if known. Normally, this information can be obtained from the police report.
94. **Driver's Gender** - Enter "1" if the driver was a male, or "2" if the driver was a female. This block is optional; however, be as diligent as possible when completing this block. If the highway user was a pedestrian, please identify gender. Normally, this information can be obtained from the police report.
95. **Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train** - Enter the appropriate entry in the code box. **Note:** If a pedestrian is identified in item 79, enter "N/A".
96. **Driver** - Enter the appropriate entry in the code box. If code "3" ("Did not stop") is used, the vehicle must be shown as moving over the crossing in **item 82**, and traveling at a speed greater than "0" in **item 80**. **Note:** If a pedestrian is identified in **item 79**, enter "N/A".
97. **Driver Passed Standing Highway Vehicle** - Identify whether the highway user, immediately before the accident, had passed another vehicle that had stopped short of the crossing. **Note:** If a pedestrian is identified in **item 79**, then enter "N/A".

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98. **View of Track Obscured by** - If the highway user's view approaching the crossing was obstructed to the extent that he or she may have been unaware that a rail consist was about to occupy or was occupying the crossing, enter the code that identifies the primary obstruction. If the highway user had a clear view of an approaching consist which had not yet occupied the crossing, enter code "8".
99. **Driver was [Condition After Accident/Incident]** - Select the code that describes the extent of harm to the driver. If the driver was fatally injured or injured to the extent of requiring medical treatment, this information should be obtained from the line entry on Form FRA F 6180.55a that the reporting railroad completed for this accident/incident.
100. **Was Driver in the Vehicle?** - If the driver of the highway vehicle was in the vehicle at the time of impact, enter "1" in the code box. If the driver had left the vehicle prior to the impact, enter "2".
101. **[Casualties to] Highway-Rail Crossing Users** - Enter the total number of reportable deaths and injuries. All deaths and injuries must match the information reported individually on Form FRA F 6180.55a by the reporting railroad. The count would **include** casualties reported in **item 99**.
102. **Highway Vehicle Property Damage** - Enter the estimated cost of damages sustained by the highway vehicle involved, as reported on Form FRA F6180.57 by the reporting railroad. The amount given should reflect the cost of repairs. If the vehicle is beyond repair, the cost is the replacement value of the vehicle. If there was no damage to the vehicle, enter "0". Do not make entries such as "totaled".
103. **Total Number of Highway-Rail Crossing Users** - Enter the total number of highway-rail crossing users involved in the incident (including the driver, if applicable). The term "Highway-Rail Crossing Users" includes those individuals directly involved in the impact and others at the crossing location who were killed or injured as result of the accident/incident.
104. **Locomotive Auxiliary Lights?** - If the leading locomotive was equipped with auxiliary lights as specified by §229.125(d), or §229.133, enter "1" in the code box. If the locomotive was not so equipped, enter "2". If "2" is entered, describe fully in the narrative section of the report. If the rail equipment movement was not a locomotive, enter "N/A", and describe fully in the narrative section of the report.
105. **Locomotive Auxiliary Lights Operational?** - If the leading locomotive's auxiliary lights as specified by §229.125(d), or §229.133, were operational at the time of the accident/incident, enter "1" in the code box. If the lights were not operational, enter "2". If "2" was entered in **item 104**, enter "N/A". If either "2" or "N/A" is entered, describe fully in the narrative section of the report.
106. **Locomotive Headlight Illuminated?** - If the leading locomotive's headlight, as specified by §229.125(a) or (b) was illuminated at the time of the accident/incident, enter "1" in the code box. If the lights were not illuminated, enter "2". If "2" is entered, describe fully in **item 126** of the report. If the rail equipment movement was not a locomotive, enter "N/A", and describe fully in **item 123** of the report.
107. **Locomotive Audible Warning Sounded?** - If the leading locomotive's audible warning device as specified §229.129 was sounded in accordance with railroad rules prior to the accident/incident, enter "1" in the code box. If the warning device was not sounded in accordance with railroad rules, enter "2". If the warning device was not functional, enter "N/A" and describe fully in **item 126** of the report. If the rail equipment movement was not a locomotive, enter "N/A", and describe fully in **item 123** of the report.
108. **Draw a sketch of accident area including all tracks, signals, switches, structures, objects, etc., involved.** Rectangles may be used to represent rail

Instructions for Completing FRA Form F6180.39

Item Instructions

equipment and highway vehicles. The following criteria may be used as starting points for the sketch:

Collisions involving two or more rail equipment consists - either the braking distance for the equipment consist that was in violation of rules; or, if signal failure was the cause, the two signals passed immediately prior to the collision.

Derailments - At least 300 feet in advance of the point of derailment (POD).

Highway-rail grade crossing accident/incident - the whistle post or whistle sign governing rail equipment movements over the crossing; and the advance warning sign or pavement marking (whichever is greater) governing highway movements over the crossing. If the crossing has neither an advance warning sign nor pavement marking, use the location where such a warning would be if it were present.

Instructions for Completing the Narrative Sections of Form FRA F6180.39

A detailed narrative is basic to a reader's understanding of the factors leading to, and the consequences arising from, an accident. While many accidents with straight forward causes can be described concisely, others are more complicated and require further clarification.

The narrative section of the F6180.39 report includes a "Synopsis" section, followed by a narrative using the four major headings described below. Written correctly, this narrative will provide readers with all of the facts necessary to understand what happened. The instructions for the narrative begin on the next page.

Narrative Instructions

Field Number	Subject
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109	Synopsis of the Accident
------------	---------------------------------

110	A detailed narrative to include the following:
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Circumstances Prior to the Accident

The Accident

Analysis and Conclusions

Probable Cause and Contributing Factors

109. **Synopsis of the Accident** - Write a short summary of the accident so the reader can understand the event. Include the following elements:
- Time and Date,
 - Movement (timetable direction, railroad, type of trains & other vehicles),
 - Type of accident,
 - Location of accident and estimated distance from nearest city or town,
 - Equipment derailed, human casualties, hazmat release and/or evacuation information, total estimated monetary damages,
 - Weather,
 - Probable cause and contributing factors. Provide concise information concerning the reasons(s) why the accident occurred. Make sure the probable cause is supported by the facts, but the facts themselves belong in the Analysis and Conclusions section of the report. Briefly describe any contributing factors, making certain that they are also supported by the facts.

Instructions for Completing FRA Form F6180.39

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***Example:** A southbound CSX freight train collided with an automobile at a highway-rail grade crossing, on January 30, 2003, at 2:30 p.m. The accident occurred near Buckner, Kentucky, at CSX Milepost 79, on the CSX Louisville Subdivision.*

The motor vehicle driver and all three passengers were killed. The automobile was completely destroyed. There were no injuries to the train crew. The leading locomotive sustained minor damage of about \$2,500, and there was no derailment.

At the time of the accident it was daylight and overcast, with a northern wind of about 20 mph. The temperature was 22 °F.

The accident was caused by failure of the motor vehicle driver to yield to the train. According to the Oldham County Sheriff's Department, the driver was in violation of Kentucky Revised Statute 189.550.

Instructions for Completing FRA Form F6180.39

Item Instructions

110. Detailed Narrative

Circumstances Prior to the Accident - This section includes the information contained in the checklist below. An example of how to write this section follows the checklist.

Circumstances Prior to the Accident Checklist

- List the job titles of all crew members or other railroad employees involved in the accident/incident. If the rail equipment consist involved on-track equipment other than a train, list the titles of the roadway workers assigned to and physically on-board that equipment.

- Place the crew on duty (date, time, location) - Concisely specify this information, including the time zone (EST, EDT, CST, CDT, etc.).

- State the statutory off duty period prior to call - If the railroad employees involved are subject to the statutory Hours of Service requirements of 49 USC Chapter 211, include a sentence indicating how the railroad complied with the statute. *Note:* Typically, a minimum 8 or 10 hour off duty period will be provided. However, the law also permits employees engaged in or connected with the movement of any train to have an off duty period of at least 4 hours, at a designated terminal under certain circumstances. Contact your Regional Operating Practices Specialist if you need assistance.

- Describe any initial equipment test information (e.g. air tests, etc.) - Describe the make-up of the train (intermodal, mineral, mixed freight, passenger, etc.), and whether the required equipment testing was performed prior to the train departing the terminal. Identify any special restrictions of the consist being reported. This paragraph should also include information on any inspections and testing performed on the consist, including train air brake tests, EOT devices, locomotive and car safety standard inspections, etc. Briefly describe any changes to the train consist while en route.

- Explain the crewmembers positions on the train and their actions as they approached the accident area - Discuss any event(s) or circumstance(s) involving the crew members that has relevance to the accident. This would include where they were physically located, and what duties they were engaged in, approaching the point where the accident/incident occurred. To better orient the reader, give both the timetable and geographic directions to describe where the crewmembers were located. Explain which will be used throughout the report.

- If this is a highway-rail grade crossing accident, describe:
 - the type of vehicle (auto, truck, bus);
 - the number of passengers;
 - the direction of travel;
 - the speed; and
 - any information you have about the actions of the vehicle driver and occupants prior to, and en route to the point of collision.

- Write two sentences that describe the topography for each movement. The first sentence should describe the curves and tangents; the second sentence should describe grade. A good rule of thumb is to go back a reasonable braking distance, and start from there.

Example: *The crew of train CSX 6153 South included a locomotive engineer, a conductor, and a train service employee. They first went on duty at 6:30 a.m., EST, January 30, 2003, at the CSX Queensgate Yard in Cincinnati, Ohio. This was the home terminal for all crew members, and all received more than the statutory off duty period, prior to reporting for duty.*

Instructions for Completing FRA Form F6180.39

Item Instructions

Their assigned freight train consisted of two locomotives, 70 loaded, and 25 empty cars of several varieties. It was 6,250 feet long, and weighed 4,500 tons. The train was scheduled to travel to Louisville, Kentucky, with cars to be added and removed at two locations en route. The train received an initial terminal train air brake test, and departed Queensgate Yard at 7:50 a.m.

The crew stopped the train to add and remove cars at two locations while en route. They removed a total of 25 cars, and added a total of 34 cars, and performed intermediate terminal train air brake tests at both locations, prior to proceeding toward Louisville.

As the southbound train approached the accident area, the locomotive engineer was seated at the controls on the west side of the leading locomotive. The conductor was seated on the east side, and the train service employee was seated in the center of the cab of the leading locomotive.

In this area of the railroad there are, in succession, a 1-degree curve to the left of about 1,200 feet, followed by a tangent of 900 feet to the point of the accident, and 2,700 feet beyond. There is a 0.5-percent descending grade. In this area of State Route 61, there is a curve to the right of about 300 feet, followed by tangent of about 100 feet to the crossing, and a considerable distance beyond. Traveling east to west on the highway, the grade is practically level.

The railroad timetable direction of the train was south. The geographic direction was southwest. Timetable directions are used throughout this report.

The Accident - The narrative for this section must be written under separate headings, in sequential order, **for each train or other vehicle involved in the accident.** *See notes governing Fields 1 and 2 of Form FRA F6180.39 regarding how trains are referenced.* This helps to properly orient the reader. How the section is written, depends in large part on whether the accident was a **collision** or a **derailment**.

Collision: The first paragraph would include:

- the estimated or recorded speed approaching the accident site (**for a collision, this is usually the speed just before the crew's recognition of an impending hazard**);
- any sight obstructions for all vehicles involved, both highway and rail. Include the names of the obstructions, their geographic direction (northeast, southwest, etc.), and the distances involved.
- the speed at the time of the collision, and the difference from the approaching speed;
- the maximum authorized speed **for this particular type of train**; and
- the means used to ascertain these facts.

Example 1: **Train CSX 6153 South**

The train was being operated at 40 mph approaching the accident area. The train crews view of the crossing was obstructed by dense vegetation adjacent to the southwest side. The engineer said he became aware of the impending collision about 600 feet in advance, at which time he told the other crew members to brace themselves. He simultaneously initiated an emergency train air brake application. The train had slowed to 36 mph when the collision occurred. Both speeds were recorded by the event recorder of the controlling (or other) locomotive. The maximum authorized speed for this train was 50 mph, as designated in the current CSX Timetable No. 1.

Note: *For this kind of collision, you would write a second paragraph for the highway vehicle. Normally, you would use the information contained in the police report to write this paragraph.*

Instructions for Completing FRA Form F6180.39

Item Instructions

Highway Vehicle

The automobile was traveling east to west on State Route 61. According to the locomotive engineer, the driver attempted to stop after the automobile entered the crossing. A report, filed by the deputy sheriff, estimated the driver was operating the vehicle at about 30 mph when the collision occurred. The deputy said his estimate was based on the length of the skid marks made by the automobile. The posted speed limit is 45 mph.

The train struck the left side of the automobile about midpoint of the left front fender. The automobile was carried south, along the track, for about 150 feet before coming to rest on the southeast side of the track. The train came to a stop about 1,500 feet south of this point.

After the train stopped, the locomotive engineer stayed on the locomotive to establish radio communications with the train dispatcher. The conductor walked back to the automobile to await arrival of emergency response personnel. The train service employee began walking the west side of the train to determine if the accident had caused the train to derail.

An Oldham County, Kentucky, deputy sheriff arrived on the scene at 2:50 p.m. The Oldham County Life Squad arrived about five minutes later. After they coordinated the emergency response, the life squad members began response for the passengers of the automobile. One of the life squad members ascertained that the train crew members needed no medical attention. The deputy sheriff then interviewed all three train crew members.

A CSX trainmaster was dispatched to the scene from Louisville and arrived about 3:45 p.m. He ascertained the condition of the train and track structure. There was no hazardous materials involvement and only minor structural damage to the lead locomotive. The trainmaster discussed the situation with the deputy sheriff. The train and crew were released to proceed at 4:30 p.m., and continued the trip to Louisville, which is about 17 miles south of Butler.

The driver and all three passengers in the automobile were taken to Humana Hospital in Louisville, where all were pronounced dead on arrival.

Derailment: Write a brief paragraph indicating:

- the estimated or recorded speed approaching the **derailment** site;
- the speed at the time of the **derailment** and the difference from the approaching speed;
- the maximum authorized speed **for this particular type of train**; and
- the means used to ascertain these facts.

Example 2: *The train was being operated at 50 mph approaching the accident area. At the time the accident occurred the train was being operated at 47 mph. Both speeds were recorded by the event recorder of the controlling (or other) locomotive. The maximum authorized speed for mixed freight trains is 60 mph, as designated in the current CSX Timetable No. 1.*

Once the lead paragraph is written for each movement, complete this section of the report with an explanation of what happened. In a logical sequence describe the accident and the results of the investigation. Make certain this includes the actions of crew members, shows the POD and equipment derailed, and indicate actions of any others involved.

If the event was a **collision**, make certain to include the actions taken by all crew members and others, once they recognized the impending hazard. Eliminate details that are not relevant, but remember that some information is relevant, even though the findings were negative. This

Instructions for Completing FRA Form F6180.39

Item Instructions

includes both FRA findings and findings of others involved in the investigation. For example, if local police responded to a highway-rail collision, tell what their relevant findings were.

If this was a collision between a train and a highway vehicle:

- State the final resting point for the highway vehicle and the train.
- Describe what the crewmembers and any other witnesses saw immediately before and during the collision.
- Describe the point of impact, the final resting place for the highway vehicle and train, and the distance between these points.
- List the organizations that responded, and describe what their emergency response was.
- Details of injuries or fatalities: Give complete details on the extent of casualties. This includes the nature and extent of injuries for each person, any medical treatment administered, and whether they were treated and released, or hospitalized.
- List monetary damages separately for rolling equipment, and the track structure and appurtenances (such as signal equipment), followed by a total of all reportable damages.

Details of hazardous materials involvement and evacuations:

- Identify, by initial and number, all cars releasing hazardous materials.
- List the name, and indicate the quantity of hazardous material released.
- Report the number of fatalities and injuries resulting from a direct exposure to the released substance.

If there was an evacuation:

- State the title of the person who initiated the evacuation;
- Estimate the number of people, the size of the affected area, and the length of the evacuation.
- Make sure to identify any leakage of locomotive diesel fuel resulting from the accident. Identify the unit(s) by initial and number, the manufacturer and model designation, the capacity of the fuel tank, the quantity of fuel released, and any consequence of the release. (Was there a fire, environmental consequences, etc.?)

Analysis and Conclusions - Although they are logically grouped together in this section of the report, the information for each must be separated. Start with the analysis, and finish with the conclusions.

Analysis: Anything written in this section must be supported by the findings in the preceding section, and must be clear to the reader. There are certain factors that must always be mentioned, depending on the type of accident you are investigating. These may include:

- Post Accident Toxicological Test Results for all persons.
- Active Warning Device Tests for highway-rail grade crossing accidents.
- Locomotive whistle, bell, and light tests for highway-rail grade crossing accidents.

Start this section with a discussion of those factors found to be non-compliant or outside the norm, but which were not causal or contributing. Finish by writing a detailed analysis of all factors that were causal, or contributed to the cause of the accident. Use the following checklist to ensure you have included all necessary topics in this section.

Instructions for Completing FRA Form F6180.39

Item Instructions

Analysis and Conclusions Checklist

- Evaluation and Testing of Equipment Involved** - Provide the details of any evaluation or testing performed on the locomotives, cars, or on-track maintenance equipment involved, or simulations performed on similar consists or equipment. Explain who performed these tests (railroad employees, contract laboratory, etc.)

 - FRA Tests or Inspections Performed and Results (equipment, operations, signal systems, track, etc.)** - Detail any FRA tests and inspections of track, equipment or operations if they are relevant to the cause. These inspections would also be included if the cause is in dispute and the information is pertinent to resolution. *Note: Efforts to resolve any such disputes do not belong in the factual report.*

 - Lab Analysis of Broken Rail or Wheel** - Briefly describe the name of the organization that performed the analysis, with a synopsis of their results.

 - Locomotive Appurtenance Tests for Highway-Rail Grade Crossing Accident (whistle, bell, etc.)** - If you are reporting a highway-rail grade crossing accident, the locomotive safety devices should be tested in your presence by a railroad employee, if possible. Include the results, even if the devices functioned as intended. Include headlights, auxiliary lights, whistle, and bell. If the locomotive involved is not available for testing in your presence, request that a responsible railroad official or agent document this data for you.

 - Active Warning Device Test Information and Results** - If you are reporting a highway-rail grade crossing accident, the crossing warning devices must be tested in your presence by a railroad employee. If the devices were tested prior to your arrival, have the railroad perform another test. Include the results, even if the devices functioned as intended.

 - Tox Test Results (crew members and/or vehicle occupants)** - Discuss any drug or alcohol use connected with this accident. If positive tests were made, but usage or impairment was not determined to be a causal factor, explain the basis of this determination. If the samples were collected and tested by a public authority (such as police or a coroner), make sure you include the results.

 - If a railroad collected samples as required by FRA's Post-Accident Toxicological Testing requirements (49 CFR Part 219, Subpart C), obtain the results from FRA's Alcohol and Drug Control Program Manager. If a railroad collected samples under the requirements of Subpart C but were in error, obtain the information from FRA's Alcohol and Drug Control Program Manager, and write a concise statement of the facts surrounding the situation.
-

Conclusions: The conclusions must focus on the cause and contributing factors, and must be fully supported by the analysis. This section must be written so that a subject matter expert can understand why you reached the conclusions, whether or not they would agree with you.

Describe what the investigators found, and the relevance of each factor described. If factors such as how the derailed equipment is stacked is relevant, that information also belongs in this section.

Instructions for Completing FRA Form F6180.39

Item Instructions

Example: Analysis

The driver was a 17 year old male. The other three passengers of the automobile were young men ages 16 and 17. The Jefferson County, Kentucky, Coroner performed toxicological testing on the remains of the driver, and the results were negative.

The highway-rail crossing at grade is equipped with warning lights and bells, but there are no gates. There is an advance warning sign posted about 200 feet from the crossing. There are also pavement markings within 100 feet of the crossing. The pavement markings are not clearly distinguishable. The dense vegetation near the crossing is not on railroad property. This area of the accident is maintained by Oldham County.

The railroad has a whistle post in place about 1,000 feet north of the crossing. All three train crew members said the locomotive engineer began sounding the whistle when the train neared this post. This was later validated by analysis of the event recorder data.

The active warning devices were tested by a CSX signal maintainer at 4 p.m. on the day of the accident, and found to function as intended. The tests were performed again at 7:30 p.m., on the same day, this time in the presence of an FRA signal and train control inspector. The warning devices functioned as intended.

The leading locomotive was equipped with a headlight, the auxiliary lights, and the audible warning device required by Federal regulations. The locomotive engineer tested these devices at the accident site in the presence of the deputy sheriff and trainmaster, and they functioned as intended. The devices were retested in Louisville at 6 p.m., on the same day, in the presence of a FRA motive power and equipment inspector. The devices were in full compliance with Federal requirements.

The locomotive was also equipped with a speed indicator and an event recorder as required. The relevant event recorder data was downloaded by the trainmaster at the accident site, and analyzed at the CSX locomotive facility in Louisville. The analysis disclosed that the locomotive engineer was in compliance with all applicable railroad operating and train handling requirements. FRA reviewed the results of this analysis, and concurred with the conclusions.

Conclusions

The railroad was in full compliance with their own, and all applicable Federal standards. The train crew members were the only witnesses to the accident, and they had no information that could be used to determine why the automobile failed to stop at the crossing. The driver had received his license about six months prior to the accident. Based on the little evidence available, the sheriff surmised that driver inexperience and inattention were predominant factors.

Probable Cause & Contributing Factors - If there is a single cause, this section would be a short paragraph,. If there are multiple or contributing causes, it may require two paragraphs. Make certain the information matches what you said in the Section 109 - Synopsis. When writing this narrative, reference the FRA Guide for Preparing Accident/Incident Reports.

Example: *The accident occurred because the driver of the automobile failed to stop at the highway-rail crossing at grade, as required by Kentucky Revised Statute 189.550. Driver inexperience may have been a contributing factor.*

Example of Items 109 and 110 of the FRA F6180.39 Report

Synopsis of the Accident

A southbound CSX freight train collided with an automobile at a highway-rail grade crossing, on January 30, 2003, at 2:30 p.m. The accident occurred near Buckner, Kentucky, at CSX Milepost 79, on the CSX Louisville Subdivision.

The motor vehicle driver and all three passengers were killed. The automobile was completely destroyed. There were no injuries to the train crew. The leading locomotive sustained minor damage of about \$2,500, and there was no derailment.

At the time of the accident it was daylight and overcast, with a northern wind of about 20 mi/h. The temperature was 22 °F.

The accident was caused by failure of the motor vehicle driver to yield to the train. According to the Oldham County Sheriff's Department, the driver was in violation of Kentucky Revised Statute 189.550.

Circumstances Prior to the Accident

The crew of train CSX 6153 South included a locomotive engineer, a conductor, and a train service employee. They first went on duty at 6:30 a.m., est, January 30, 2003, at the CSX Queensgate Yard in Cincinnati, Ohio. This was the home terminal for all crew members, and all received more than the statutory off duty period, prior to reporting for duty.

Their assigned freight train consisted of two locomotives, 70 loaded, and 25 empty cars of several varieties. It was 6,250 feet long, and weighed 4,500 tons. The train was scheduled to travel to Louisville, Kentucky, with cars to be added and removed at two locations en route. The train received an initial terminal train air brake test, and departed Queensgate Yard at 7:50 a.m.

The crew stopped the train to add and remove cars at two locations while en route. They removed a total of 25 cars, and added a total of 34 cars, and performed intermediate terminal train air brake tests at both locations, prior to proceeding toward Louisville.

As the southbound train approached the accident area, the locomotive engineer was seated at the controls on the west side of the leading locomotive. The conductor was seated on the east side, and the train service employee was seated in the center of the cab of the leading locomotive.

In this area of the railroad there are, in succession, a 1-degree curve to the left of about 1,200 feet, followed by a tangent of 900 feet to the point of the accident, and 2,700 feet beyond. There is a 0.5-percent descending grade. In this area of State Route 61, there is a curve to the right of about 300 feet, followed by tangent of about 100 feet to the crossing, and a considerable distance beyond. Traveling east to west on the highway, the grade is practically level.

The railroad timetable direction of the train was south. The geographic direction was southwest. Timetable directions are used throughout this report.

The Accident

Train CSX 6153 South

The train was being operated at 40 mph approaching the accident area. The train crew's view of the crossing was obstructed by dense vegetation adjacent to the southwest side. The engineer said he became aware of the impending collision about 600 feet in advance, at which time he told the other crew members to brace themselves. He simultaneously initiated an emergency train air brake application. The train had slowed to 36 mph when the collision occurred. Both speeds were recorded by the event recorder of the controlling (or other) locomotive. The maximum authorized speed for this train was 50 mph, as designated in the current CSX Timetable No. 1.

Highway Vehicle

The automobile was traveling east to west on State Route 61. According to the locomotive engineer, the driver attempted to stop after the automobile entered the crossing. A report, filed by the deputy sheriff, estimated the driver was operating the vehicle at about 30 mph when the collision occurred. The deputy said his estimate was based on the length of the skid marks made by the automobile. The posted speed limit is 45 mph.

The train struck the left side of the automobile about midpoint of the left front fender. The automobile was carried south, along the track, for about 150 feet before coming to rest on the southeast side of the track. The train came to a stop about 1,500 feet south of this point.

After the train stopped, the locomotive engineer stayed on the locomotive to establish radio communications with the train dispatcher. The conductor walked back to the automobile to await arrival of emergency response personnel. The train service employee began walking the west side of the train to determine if the accident had caused the train to derail.

An Oldham County, Kentucky, deputy sheriff arrived on the scene at 2:50 p.m. The Oldham County Life Squad arrived about five minutes later. After they coordinated the emergency response, the life squad members began response for the passengers of the automobile. One of the life squad members ascertained that the train crew members needed no medical attention. The deputy sheriff then interviewed all three train crew members.

A CSX trainmaster was dispatched to the scene from Louisville and arrived about 3:45 p.m. He ascertained the condition of the train and track structure. There was no hazardous materials involvement and only minor structural damage to the lead locomotive. The trainmaster discussed the situation with the deputy sheriff. The train and crew were released to proceed at 4:30 p.m., and continued the trip to Louisville, which is about 17 miles south of Butler.

The driver and all three passengers in the automobile were taken to Humana Hospital in Louisville, where all were pronounced dead on arrival.

Analysis and Conclusions

Analysis

The driver was a 17 year old male. The other three passengers of the automobile were young men ages 16 and 17. The Jefferson County, Kentucky, Coroner performed toxicological testing on the remains of the driver, and the results were negative.

The highway-rail crossing at grade is equipped with warning lights and bells, but there are no gates. There is an advance warning sign posted about 200 feet from the crossing. There are also pavement markings within 100 feet of the crossing. The pavement markings are not clearly distinguishable. The dense vegetation near the crossing is not on railroad property. This area of the accident is maintained by Oldham County.

The railroad has a whistle post in place about 1,000 feet north of the crossing. All three train crew members said the locomotive engineer began sounding the whistle when the train neared this post. This was later validated by analysis of the event recorder data.

The active warning devices were tested by a CSX signal maintainer at 4 p.m. on the day of the accident, and found to function as intended. The tests were performed again at 7:30 p.m. on the same day, this time in the presence of an FRA signal and train control inspector. The warning devices functioned as intended.

The leading locomotive was equipped with a headlight, the auxiliary lights, and the audible warning device required by Federal regulations. The locomotive engineer tested these devices at the accident site in the presence of the deputy sheriff and trainmaster, and they functioned as intended.

The devices were retested in Louisville at 6 p.m., on the same day, in the presence of a FRA motive power and equipment inspector. The devices were in full compliance with Federal requirements.

The locomotive was also equipped with a speed indicator and an event recorder as required. The relevant event recorder data was downloaded by the trainmaster at the accident site, and analyzed at the CSX locomotive facility in Louisville. The analysis disclosed that the locomotive engineer was in compliance with all applicable railroad operating and train handling requirements. FRA reviewed the results of this analysis, and concurred with the conclusions.

Conclusions

The railroad was in full compliance with their own, and all applicable Federal standards. The train crew members were the only witnesses to the accident, and they had no information that could be used to determine why the automobile failed to stop at the crossing. The driver had received his license about 6 months prior to the accident. Based on the little evidence available, the sheriff surmised that driver inexperience and inattention were predominant factors.

Probable Cause & Contributing Factors

The accident occurred because the driver of the automobile failed to stop at the highway-rail crossing at grade, as required by Kentucky Revised Statute 189.550. Driver inexperience may have been a contributing factor.

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Format for Employee & Contractor Fatality Investigations - FE's & CFE's

The following narrative format will be used to report railroad and contractor employee fatalities. An interim five-day report is required.

Header information is standard. Font is Times New Roman in size 12. Top, bottom and side margins should be 0.813 inches.

REPORT: (FRA assignment number)

RAILROAD: Full Railroad Name and (RR Code)

LOCATION: City, State

DAY, DATE, TIME: Day of Week, Month, Date, Year, Time (time zone)

EVENT: Text from FRA Guide for Preparing Accident/ Incident Reports, Appendix F

PROBABLE CAUSE: Cause of accident/incident (not cause of death). Typically this is the last action on the part of the individual that made the event inevitable.

CONTRIBUTING FACTORS: Other actions or inactions that combined to create the event

EMPLOYEE: Occupation.....Job Title (Including Class of Service)
Activity.....What was the employee doing?
Age.....Years
Length of Service.....Years
Last Formal Rules Training.....Date
Last Formal Safety Training.....Date
Last Physical Examination.....Date
Last Relevant Efficiency Test..Date

Circumstances Prior to the Accident/Incident

(Section 1) Place employee on duty. Make descriptive statements concerning train/crew consist(s), reporting location(s), actions by crew up to point of accident. Describe any event related to the accident or incident's occurrence (inspections, tests, was a safety briefing held, or other occurrences that will have prominence in the accident). State whether this was the employee's regular assignment or not, had the employee worked this area/assignment before and if so, how long ago? Separate out multiple movements or groups into additional paragraphs.

(Section 2) Describe the area clearly enough so that the reader could draw a sketch of the area from your description and also include conditions such as lighting, ground conditions, structures involved, etc.

(Section 3) Describe weather conditions and include wind speed, chill factor, direction, temperature, ground conditions, visibility, and footing conditions.

The Accident/Incident

Describe actions immediately prior to, during, and after the incident. In an orderly sequence of events, describe the incident, then summarize events that occur as a result of the incident. End this section with emergency response, treatment provided, and declaration of death. Include time and date if different calendar day.

Post-Accident/Incident Investigation

(Section 1) Describe FRA's post-accident investigation results. Describe any FRA inspections of equipment or conditions that might have contributed to the incident and state the results of that inspection (attach inspection report to investigation). A good illustration would be the inspection of safety appliances after an employee fell from a piece of equipment. Use of railroad investigation documentation is permissible, but always conduct an independent FRA investigation. This section will also include, when applicable, the information developed as a result of the use of General Bulletin No. G-03-02 which concerns human factor circadian rhythms. Special attention to the Schedule Worksheet (attachment 2 of G-03-02) is required. Both the Worksheet and the Questionnaire contained in G-03-02 will be made a part of the file.

(Section 2) Detail pertinent outside inspections or investigations performed by the railroad, public entities, or other parties to the investigation.

(Section 3) Describe results of toxicological testing performed.

Analysis and Conclusions

Analysis: Anything included in this section must be supported by the findings in the preceding sections and should be made clear to the reader. Certain factors, if applicable, must be included, for example:

- Post Accident Toxicological Test Results,
- Employee Training; Experience; Qualifications; Fatigue factors,
- Interaction with other employees, and
- Evaluation and testing of involved equipment.

Begin this section with a discussion of factors found to be non-compliant or outside the norm, but which were not causal or contributing. Conclude by writing a detailed analysis of all factors that caused, or contributed to the cause of, the accident/incident.

Conclusions: The conclusions must focus on the cause and contributing factors and must be fully supported by the analysis. This section must be written so that the subject matter expert can understand why you reached the conclusions, whether or not they would agree with you. Describe what the investigators found, and the relevance of each factor described.

Applicable Rules

Detail rules applicable to the probable cause or contributing factors of the accident/incident. This section is not limited to railroad rules. Applicable rules could be federal, state or local laws, regulations, or other prohibitions.

Documentation - Attach:

- Appropriate documentation including interviews, sketch of scene, copies of pertinent applicable rules.
- A copy of the death certificate, medical examiner's report or other official documentation stating the cause of the fatality.
- A copy of the rules publication cover and the pages containing the rule(s) on 8½" x 11" sheets.
- Appropriate electronic media containing the narrative.
- Copies of non-FRA investigation reports should be included (OSHA, police, etc.).

Note 1: In non-train accident/incidents where Department of Labor rules under the Occupational Safety and Health Act (OSHA) regulations prevail, the inspector shall inform the railroad that OSHA should be notified. If the railroad declines to notify OSHA, the inspector will notify the Regional Administrator for guidance.

Note 2: Inspectors assigned the responsibility of developing the facts surrounding a Switching Operations Fatality Analysis (SOFA) related employee fatality will use Appendix G of the SOFA "Findings and Recommendations of the SOFA Working Group" report dated October 1999 for additional guidance.

Natural Cause Fatality Investigations:

Inspectors assigned the responsibility of developing the facts surrounding a natural cause employee fatality will use the “FE Format” discussed above. However, the 5-day report will **not** be necessary and the final report will omit the Post-Accident Investigation, Analysis and Conclusions and the Applicable Rules sections of the FE Report. The Report will include a brief narrative entitled The Incident and will contain the circumstances surrounding the fatality in lieu of the section entitled The Accident/Incident. A death certificate, medical examiner’s report or other official documentation stating that the cause of the fatality was determined to be of natural causes will be sufficient.

Employee Fatality Investigation (FE) Example

REPORT: FE-08-94

RAILROAD: The Atchison, Topeka and Santa Fe
Railway Company (ATSF)

LOCATION: Castle Rock, Colorado

DATE, TIME: February 9, 1994, 11 a.m. (MST)

EVENT: Struck by on-track equipment

PROBABLE CAUSE: The train crew members of a work train did not provide a lookout on the caboose while backing up.

CONTRIBUTING

FACTORS: The train crew members did not operate their train at restricted speed; or comply with Federal radio standards and procedures. The carrier did not implement existing procedures to provide positive protection for the Bridge and Building (B&B) employees, and failed to provide proper supervision to direct and coordinate the ditching operation. The B&B employees contributed to the severity of the accident by not maintaining a sharp vigil as they repaired roadway signs while their hi-rail truck occupied a main track.

EMPLOYEE: Occupation Mechanic/Welder(MofW)

Activity Replacing right-of-way signs

Age 60 years

Length Of Service 41 years

Last Rules Training January 26, 1994

Last Safety Training. February 1, 1994

Last Physical Examination June 3, 1992

Circumstances Prior To The Accident

At 7 a.m. on February 9, 1994, four ATSF maintenance employees reported for work at Castle Rock, Colorado (milepost 705.2). Two of the maintenance employees, a machine operator and a trackman, were assigned to operate a Jordan spreader as part of a work train. A Jordan spreader is an on-track piece of maintenance-of-way equipment that is used to clean and deepen right-of-way ditches. It is not self-propelled, and was included in the work train equipment consist. The other two ATSF maintenance employees, a B&B bridge inspector and a B&B mechanic/welder, were assigned to repair or replace right-of-way signs that were disturbed or damaged as a result of the work train ditching operation. The B&B employees were assigned a hi-rail pick-up type truck for transportation.

Also at 7 a.m. on the day of the accident, an ATSF work train crew consisting of a conductor, engineer, and brakeman reported for duty at Big Lift, an ATSF station located 12.8 miles north of Castle Rock. The crewmembers had completed their statutory off duty period. The crew obtained Track Warrant No. 00005 which authorized their train, designated as ATSF 6355 South, to work on an 18 mile section of the southward main track of the two track main line between Orsa (milepost 709.5) on the north and Greenland (milepost 691.5) on the south. Track Warrant authority for the movement of trains on the southward main track is supplemented by the signal indications of an Automatic Block Signal (ABS) system arranged for movement southward with the current of traffic. The two main tracks in this area are separated by a sizable distance. The grade in the accident area is 1.33 percent, descending northward.

After obtaining their Track Warrant, the work train crewmembers traveled in the conductor's personal automobile from Big Lift to their train which was located on the siding at Castle Rock. At Castle Rock the work train crewmembers and the maintenance employees held a job briefing to discuss the day's work activities. At about 8:30 a.m., after making the required train air brake test, the work train crew moved their train from the siding onto the southward main track, and operated southbound to clean and improve the right-of-way drainage ditches between Milepost 704 and Milepost 701.9. The work train was 270 feet in length. From the south, it consisted of the Jordan spreader, locomotive ATSF 6355, two gondolas and a caboose. The short end (front) of the locomotive faced southward as did the control compartment of the Jordan spreader.

The two B&B employees set their hi-rail truck on the southward main track behind the work train and proceeded southbound to repair right-of-way signs. This placed the B&B employees within the Track Warrant limits authorized for the work train. The B&B employees repaired the right-of-way signs until about 10 a.m. when they exhausted their supplies. The bridge inspector notified the machine operator that he was removing the hi-rail from the track to go for additional supplies, and to pick up the machine operator's personal vehicle.

At about 10:45 a.m., after transferring additional materials from the B&B mechanic/welder's truck to the hi-rail truck, the bridge inspector and B&B mechanic/welder returned to the work area. The bridge inspector talked on the company radio to the machine operator and advised him that he had returned with the machine operator's personal vehicle. However, he did not apprise the machine operator of his intention to reoccupy the southward main track with the hi-rail truck.

The two B&B employees then placed the hi-rail truck on the southward main track at the Territorial Road crossing (milepost 702.9). The front of the truck faced southward. They traveled southbound to Milepost 702, and stopped to work on the milepost sign. They stood behind the truck's tailgate in the gage of the southward main track which is tangent for over 1.5 miles in each direction.

Meanwhile, the work train was located near Bridge 701.83, less than one-quarter mile south of the hi-rail truck. The engineer and brakeman were seated in the locomotive control compartment. The engineer was at the locomotive control stand on the west side, and the brakeman was by the window on the opposite side.

The machine operator and trackman were in the control compartment of the Jordan spreader. The conductor was in his private automobile about one-quarter mile south of the work train on an adjacent highway that paralleled the west side of the railroad right-of-way. In the accident area the highway, U.S. 85, shares a common property line with the railroad, and is 52 feet west of the southward main track.

The weather was clear, cold, and sunny. The temperature was approximately 20 °F.

The Accident

According to the engineer, at about 10:55 a.m., the Jordan spreader operator notified him via radio that another pass was needed to deepen the track ditches. This required the work train crew to back up their train northbound so as to reposition the Jordan spreader for the additional pass. The work train backed up northbound at a speed of between 3 and 5 mph, and had traveled only a short distance when the engineer observed a workman lying in the ditch on the west side of the track. The engineer stopped the work train, and the brakeman climbed down from the locomotive to investigate. The brakeman found the injured bridge inspector in the ditch, and the mechanic/welder unconscious underneath the northernmost gondola. The caboose had collided with the hi-rail truck during the back-up movement, and shoved the truck into the B&B employees standing directly behind it. The hi-rail truck derailed in the track parallel to the rails, and sustained \$3,500 in damages. The crew of the work train contacted the train dispatcher on the radio to report the accident and request assistance.

Emergency response personnel responding to the accident included the Castle Rock Fire and Rescue Team, the Douglas County Sheriff's Department, and the Douglas County Coroner. The B&B mechanic/welder suffered massive head injuries, and was declared dead at the accident site by the Douglas County Coroner. The bridge inspector was transported to the Swedish Memorial Hospital, Englewood, Colorado, where he was treated for leg injuries and post-accident trauma.

Post-Accident Investigation

According to ATSF officials, the B&B employees should have obtained a Track Car Line-up as required by Rule 951 Placement or Movement on Tracks and Rule 952 Line-Ups, before they placed their hi-rail truck on the main track. Rule 952 also requires a sharp lookout at all times. According to the bridge inspector, he did not obtain a Track Car Line-up from the dispatcher. Instead, on the day of the accident, as well as for the three previous days, he utilized the authority that had been granted to the work train by Track Warrant to place the hi-rail truck on the main track and work within the same limits. That procedure is not permitted by carrier rules.

When the B&B employees returned with the additional signpost material and the machine operator's personal vehicle no formal notice was given to either the Jordan spreader operator or the work train crewmembers that the B&B employees intended to reoccupy the main track with their hi-rail truck.

According to the bridge inspector, there was no discussion between either B&B employee as to who would maintain a sharp vigil as they worked behind the hi-rail truck to repair the roadway sign. However, their failure to maintain a sharp vigil contributed to the severity of this accident. A railroad access road located adjacent to the east side of the southward main track provides easy access to the railroad right-of-way at the accident site, and the roadway signs at the accident site could have been repaired without ever placing the hi-rail truck on the main track. However, other signs located south of the accident site would also be in need of repair as a result of the ditching operation, and this necessitated the placement of the hi-rail truck on the track to improve the overall job efficiency.

Carrier operating rules require that a crewmember must take a conspicuous position on the leading car or in advance of a shoving movement to provide protection. Additionally, ATSF Timetable Special Instructions require that when handling cars ahead of an engine on a main track, movement must be made at restricted speed, i.e., that will permit stopping within one-half the range of vision.

At the time of the accident, the conductor was in his private automobile, located south of the work train, trying to contact the dispatcher on the radio. According to the conductor he could not see the north end of the work train from that location, and because he was utilizing a different radio channel, did not hear the Jordan spreader operator's request that required the back-up movement.

The brakeman remained in the work train locomotive control compartment throughout the back-up movement. Thus, none of the work train's crewmembers were in position to provide the required protection for the northbound back-up movement. Furthermore, the engineer could not see the trackage behind the caboose, and therefore, could not operate the work train at restricted speed. These factors made the collision with the hi-rail truck a virtual certainty.

According to the engineer of the work train, he initiated the northbound back-up movement based solely on the Jordan spreader operator's radio communication request for the work train to make one more pass through the work area. Federal Radio Standards and Procedures (49 CFR Part 220) require that when radio communication is used in lieu of hand signals in connection with a back-up movement, the distance of the movement must be specified. Implicit in that requirement is the understanding that the way is known to be clear for the distance specified.

The provisions of 49 CFR Part 220 also require that any radio communication which is not completed in accordance with its requirements be treated as though not sent, and that radio communications may not be used in connection with a railroad operation in a manner which conflicts with the requirements of Part 220. The engineer's failure to comply with those Federal requirements is a contributing factor

in this accident, and as a result of this investigation, a recommendation for prosecution against the ATSF is being submitted.

Prior to receiving the request for emergency assistance, the dispatcher on duty at the time of the accident had not communicated with either the work train crew, the maintenance workers on the Jordan spreader, or the B&B employees operating the hi-rail truck. This dispatcher commenced duty at 8:36 a.m. The Track Warrant for the work train was issued earlier by a dispatcher on the preceding shift.

The ATSF maintenance employees were cleaning ditches with the work train and repairing right-of-way signs without a foreman, supervisor, or designated employee in charge to direct and coordinate work train movements and B&B activities. The lack of organization and coordination was a primary contributing factor to this accident. An ATSF senior official indicated that the carrier does require and conduct operational tests on maintenance of way employees to ensure rules compliance. However, there was no record of any operational tests conducted on the Denver Subdivision.

Results of toxicological testing of the deceased, the dispatcher, and the work train crewmembers were negative.

Analysis and Conclusions

A Track Car Line-up would not have provided the two B&B employees with any protection because Track Warrant No. 00005 was in effect at the time of the accident, and the work train would have been the only train listed on a Track Car Line-up covering the accident area. Both B&B employees could see the work train on the main track south of their hi-rail truck.

However, there are other carrier rules that should have been utilized to provide positive protection for the two B&B employees. For example Rule 412, Protecting Men or Machines, provides for a track warrant to be issued to protect men or machines within the same or overlapping limits with a train when, in part, trains authorized to occupy the same or overlapping limits have been notified of the authority granted men or machines and have been instructed to make all movements at restricted speed and to stop short of men or machines on or fouling track. The employee in charge of maintenance must also be notified by track warrant.

With the application of Rule 455, Protection by Track Bulletin, maintenance of way employees can be granted the exclusive use of a section of track. A track bulletin can require that a train must not enter the limits granted to maintenance employees until verbal authority is received from the maintenance employee in charge. Clearly the application of Rules 412 and in particular 455 would have provided positive protection for the two B&B employees.

The B&B employees did not inform either the Jordan spreader operator or the work train crewmembers that they intended to reoccupy the main track with their hi-rail truck when they returned to the work site with the additional signpost material. Although there was no requirement for the B&B employees to report on or off the track, their failure to inform either a work train crewmember or the Jordan spreader operator effectively negated the casual understanding that existed between those employees regarding the B&B employees' utilization of Track Warrant 00005 to occupy the main track. This illustrates the critical importance of properly utilizing approved procedures that will assure the highest level of worker protection. The carrier's decision not to require and enforce the provisions of the positive protection rules, such as Rule 455, is the primary contributing factor in this accident.

Applicable Rules

*GENERAL CODE OF
OPERATING RULES*

*SECOND EDITION
EFFECTIVE — October 29, 1989*

103(J). SHOVING OR FOULING: When cars or engines are shoved and conditions require, a crew member must take a conspicuous position on the leading car or in advance of the movement to provide protection. . .

DEFINITIONS

Restricted Speed: A speed that will permit stopping within one half the range of vision. . .

*ATSF System Timetable No. 3
In Effect at 12:01 a.m.
Sunday, October 25, 1992*

*All Subdivisions
Special Instructions*

Rule 103(E) amended to read: When handling cars ahead of engine on main track or controlled siding, movement must be made at restricted speed.

*RULES AND INSTRUCTIONS
FOR
MAINTENANCE OF WAY
AND STRUCTURES
Effective October 29, 1989*

OPERATION OF TRACK CARS

Rule 951. PLACEMENT OR MOVEMENT ON TRACKS: Track cars may be placed upon the track and operated with the following types of protection:

(1) Track Car Line-up.....Rule 952

Rule 952. LINE-UPS: Line-up of all trains will be issued by the train dispatcher and will be copied on the prescribed form and repeated unless mechanically transmitted. Before occupying track, the track car operator will read the line-up to all other occupants of the track car and retain line-up in his possession until the end of the work period.

Track car operators must not depend entirely on line-ups but must at all times keep a sharp lookout and take other measures as will ensure safety. . .

*Code of Federal Regulations
Part 220 - Radio Standards and Procedures
Subpart B - Radio Procedures*

220.43 Communication consistent with rules.

Radio communication may not be used in connection with a railroad operation in a manner which conflicts with the requirements of this part 220, . . .

220.45 Communication must be complete.

Any radio communication which is not understood or completed in accordance with the requirements of part 220 and the operating rules of the railroad, shall not be acted upon and treated as though not sent

220.49 Switching, backing, or pushing.

When radio communication is used in lieu of hand signals in connection with switching, backing or pushing of a train, engine or car, the employee directing the movement shall give complete instructions or keep in continuous radio contact with the employees receiving the instructions. When backing or pushing a train, engine, or cars, the distance of the movement must be specified, and the movement must stop in one-half the remaining distance unless additional instructions are received. . .

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FRA Interview Guide

Foreword

FRA considers the interview process *to be voluntary* in almost every case. If someone doesn't wish to be interviewed, that will normally be the end of it. FRA's Office of Chief Counsel does have the authority, however, to issue administrative subpoenas requiring a person to submit to an interview. We would only use that authority during accident investigations or instances of significant legal non-compliance.

If you believe it necessary for FRA to use its subpoena powers to require someone to be interviewed, you must gain concurrence from your regional or deputy regional administrator, as well as the Office of Chief Counsel. Make certain you really need the information that would be gained from an interview before following this path.

I. INTRODUCTION TO INTERVIEWING

- A. This section of the workbook is designed to guide you in the use of interviewing techniques and in the preparation of sworn statements in your role as an FRA Inspector.
- B. Interviewing is a process of interaction or communication between one person and another (or several) for the purpose of securing information.
- C. There are three types of interviews.

- 1. **Informal** - Getting information from fellow employees, supervisors, subordinates.
- 2. **Formal** - Applicants for admission or benefits. (Some of these could be informal) Witnesses.
- 3. **Interrogation** - Obtaining information from a reluctant interviewee. (the person may be suspected of some wrongdoing or may be reluctant to give information even as a disinterested witness.)

NOTE: It is the policy of FRA to interview witnesses as opposed to interrogation.

- D. Proficiency in interviewing can be acquired, but it is more of an art than an exact science. There is always room for initiative and individuality. Nevertheless, a study of general rules and specific suggestions often helps the beginner to avoid mistakes, to focus on essentials, and to get at the truth.
- E. Listening is the key. Give the subject an opportunity to talk. Even though someone rambles on, listen. Be especially alert for ideas which bear even remotely on your topic. A common mistake is to do most of the talking. Don't lecture, listen.

II. PREPARING FOR THE INTERVIEW

- A. Conduct the interview as soon as possible. Next to internal (interagency) communication and documentation, it holds the highest priority.
- B. Preparation is essential. Plan the questions you are going to ask. Know what information you are trying to obtain. If a file or application is involved, be familiar with it. Don't fumble with the file and stumble over questions.
- C. When possible, select an area in which a comfortable rapport between parties can be established. The ideal place would be an office that is private, quiet and free from interruptions.
- D. Try to avoid barriers such as a counter or piece of furniture between yourself and the interviewee. The person should sit at the right or left of the interviewer's desk.
- E. Frequently you will be required to interview persons under unfavorable conditions - telephones ringing, people interrupting, etc. You must learn to adapt to these conditions.

III. FIRST STEP IN THE INTERVIEW PROCESS IS THE GREETING

- A. The initial greeting can affect the tone of the session. Consider the age, the sex, the physical and mental capabilities of the person being interviewed, but keep in mind the purpose of the interview.
- B. Smile, introduce yourself (show your credentials) and provide light conversation. If the interview is conducted in your office or hotel room, offer a chair. Be warm but firm, and you will gain your interviewee's respect.
 - (1) Guard against being over friendly.
 - (2) Don't be buddy buddy. He/she may feel you are trying to trick him/her.
- C. Treat the person as an individual; convey the impression that his/her information is important. The person should not get the impression that the interview is a chore for you.

IV. DEFINE YOUR ROLE

- A. Explain the purpose of the interview without appearing cold or unfeeling.
- B. Explain that you are after the facts, and you are not out to "get" anybody.

V. QUESTIONING

- A. Ask an open question to get the interview underway, such as: "What is your full name and occupation?"
- B. Questions should be as uncomplicated as possible.
- C. Questions should not be emotional or biased.
- D. Avoid "yes" and "no" type questions. Some people will agree just to be agreeable. The purpose of your interview is to get meaningful information and that is somewhat less likely with "yes/no" questions.
- E. Avoid too rapid questioning. This causes excessive tension.

VI. INTERVIEWING TECHNIQUES

- A. **Take notes during the initial narration of the witness.** Explain to the witness that the notes are used to suggest areas in his/her narration that may require further explanation. The note-taking should be unobtrusive, and the consent of the witness should be requested.

Discretion should be used, and note-taking should cease if it is distracting to the witness. Notes should not be so extensive that the witness becomes absorbed with what you are doing.

- B. The interview is not an opportunity for the interviewer to browbeat or condemn the person being questioned. The chief purpose is to get the person to talk. By talking, the person gives information that may or may not be of value. It's up to you to sort this out.
- C. Show courtesy and consideration at all times. Be patient if the witness has difficulty in remembering details. Expect witnesses to have periodic voids. If the witness is unsure in a given area, allow him/her to record their statement that way. Do not insist that they give a straight "yes" or "no" answer.

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- D. Frequently the witness has difficulty putting into words what he/she has observed. In such cases, explanatory sketches or diagrams are valuable supplements to the witness statements. However, they are not substitutes for the narrative. When there is doubt in your mind concerning the exact meaning of a statement, check the answer. The simplest method is to rephrase the answer and get the witness to confirm it.
- E. The interviewer must also talk, but the prime purpose is to keep the person talking and responding. An inexperienced interviewer finds it easier to do the talking and consequently falls into the habit of lecturing.
- F. Too often an interviewer lectures people, and by doing so exhibits a lack of interviewing skill, a domineering attitude, or both. One way to keep the person talking is to pause, making the person feel responsible for keeping the conversation moving. Often if the interviewer pauses long enough, the person being interviewed will volunteer additional conversation and comments just to break the tension.
- G. It is important that the person be kept talking about matters relative to the case in hand. Some people, unintentionally or otherwise, wander off into a meaningless conversation. The interviewer must maintain control of the interview. In order to do this, learn to ignore some of the comments made by the other person.
- H. Give your undivided attention to the person you are interviewing. Don't open mail, make telephone calls, doodle on blotter, search for files, manicure finger nails, arrange things on your desk, or walk around the room when conducting an interview.
- I. Watch facial expressions or movements by the person. (Don't stare, but observe periodically).
- J. Change your own facial expression. Don't sit with a deadpan expression on your face.
- K. Avoid prejudice. (Prejudice is a matter of prejudging someone, usually on the basis of a physical feature, behavioral trait, or mannerism.)
- L. Don't feign interest or overact.
- M. Avoid nervous habits such as adjusting glasses, twiddling thumbs, picking teeth, etc. These mannerisms antagonize.
- N. Avoid arguing with the witness, particularly concerning moral responsibility of the crew, operator, railroad, etc. Witnesses have been known to regard the interview as a medium for voicing their opinions on management, labor relations, accident prevention and so forth. Be sympathetic and attempt to get them back on the subject concerning their observations related to the occurrence.
- O. Don't talk down to the person you are interviewing; carry the interview at the person's level.
- P. Attempt to have the witness confine his/her comments to their observations. Avoid hearsay or areas not within their personal knowledge. If they report that someone else described the occurrence to them, take the name and contact that person at a later date. Get the full meaning of each statement of the witness. Analyze each answer carefully for suggestions or leads to further questions.
- Q. After the witness has completed his/her narrative, you will usually have some specific questions to ask relative to areas that appear in your notes.

VII. INTERVIEW RELATIONSHIP

- A. Try to establish rapport with the person you're interviewing. Give them your undivided attention, show a genuine interest in their information and in them as a person. Try to avoid registering surprise or disbelief when a witness is talking to you.

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- B. Make a concerted effort to conceal whatever prejudices you may have. The person will speak more freely if he/she senses no prejudice on your part.
- C. Remember that the interviewee may have prejudices too. He/she may have had an unhappy experience with another inspector, or may have gained a distorted view of FRA through his/her acquaintances or other sources.

VIII. CHANGING TOPICS

- A. Often during an interview you will be required to obtain information on a number of topics. If you change topics too quickly your abruptness may provoke anxiety in the interviewee.
- B. There are three types of transitions that will assist you to obtain information. The three types are: Gentle, Definite, and Sharp.
- C. Gentle or smooth transition
 - (1) Interviewee is allowed to proceed at his own pace.
 - (2) Interviewer may suggest a topic when there is a natural break in the conversation.
 - (3) To obtain more information about a topic use an open question such as "What else could you add about that?"
- D. Definite Transitions
 - (1) Politely interrupt the interviewee and clarify what has been said to be sure you understand the main points and, using an open question, suggest a new topic.
 - (2) Should not be used in the beginning of an interview and only sparingly near the end.
- E. Sharp Transition
 - (1) Used very seldom.
 - (2) Rapid change of topics.
 - (3) Will provoke anxiety. You may want to do this when the subject is extremely uncooperative and aloof, or the interviewee becomes overconfident and you cease to make progress.
 - (4) Interviewee may become upset and the effectiveness of the interview is destroyed.

IX. NON VERBAL COMMUNICATION (BODY LANGUAGE)

- A. We all read body language without knowing it. We will observe a subject and get "that feeling"; something just doesn't look right. The subject is conveying indicators through his/her actions. He/she is not aware of it because he/she is doing other things to look normal. He/she can control some actions but not all.
- B. Non-verbal communication should never be taken out of context. It can never stand alone. The entire body must be observed and also taken into consideration with verbal communications. Non-verbal communications should be used as a guide, but you should be careful not to overrate your ability to interpret the signs. Non-verbal indicators do differ from one person to the next, and from one culture to another
- C. Consider the eyes first, when interviewing a person. A subject finds it hard to maintain eye contact when telling a lie. Some eye wandering, however, is normal in a person being questioned. They are generally nervous and a little frightened.

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- D. Tension and anxiety are normally indicated by rapid blinking. His/her eyes may shift away when faced with a certain point or question. This could mean you've struck a sensitive area. A twitch under the eye could mean that the subject is experiencing a great deal of stress. The pupils can be valuable in determining the mood of a question. The pupil contracts when confronted with something unpleasant. Eye contact should never be too direct. You should read the eyes, but it should not be overdone.
- E. The mouth is physically easier to read. Most of us recognize tight lips as an indication of anger. Movement of the lips and tongue may be a sign of anxiety. Dryness of the mouth may mean that the person is tense or telling a lie.
- F. A normal tension relieving movement is a brushing back of the hair. You can get an indication of the subject's emotional state by observing the frequency of such actions. Other actions which may indicate nervousness: wringing of the hands, pulling on the tie, fingering of a button, or brushing at the clothes with the hands, etc.
- G. The entire body should also be watched. Movement during questioning may indicate that a person is nervous. He/she may be fidgety. He/she may repeatedly slide down in the chair and then back up again. The legs may cross and uncross. His/her body may tense up with certain questions and then relax with a more pleasant question.
- H. Remember that the interviewee may likewise be reading your body language. He/she may sense that you are getting tired or worn down - and he/she may decide to resist a little longer in hopes that you'll give up. Don't neglect your own body language.
- I. A word of caution about body language. Do not read into it what you want to find instead of what is really there. Use body language to your advantage but use it as an investigative tool and not as evidence. Use it as a guide for further questions.

X. CLOSING THE INTERVIEW

- A. The ending of an interview is as important as its beginning. The process of closing must be orderly and definite, but not too abrupt.
- B. You can summarize briefly what has been covered or accomplished.
- C. You can state or suggest courses of action to be taken by the person being interviewed.
- D. You can state actions to be taken.

XII. TYPES OF STATEMENTS

- A. Certain employee interviews require the use of a signed statement. Section 5(f)(1) of the 1988 Rail Safety Improvement Act, reads as follows: "Except as provided in paragraph (2), or **with the written consent of the employee**, the Secretary (of Transportation) shall not disclose the name of any employee of a railroad who has provided information with respect to an alleged violation of this title, any other Federal railroad safety law, or any rule, regulation, order or standard issued under this title or any other Federal railroad safety law."

Paragraph (2) states: "The Secretary shall disclose to the Attorney General the name of an employee described in paragraph (1) of this subsection if the matter is referred to the Attorney General for enforcement."

When it is necessary to obtain a signed statement, impress upon the person being interviewed the importance of the statement about to be given.

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The FRA "Statement of Witness to Safety Violation" heading on plain bond paper is used for the face sheet, plain bond paper is used on subsequent pages. The signature sheet is used for the last page.

- (1) The statement should generally be developed in a chronological sequence.
 - (2) Conduct an initial question and answer session before the statement is written. Using your notes, review the pertinent facts and put them in chronological order. If necessary, ask the witness to clarify relevant points.
 - (3) During questioning use plain and simple language.
 - (4) A responsive answer should be obtained before proceeding to the next question.
 - (5) The subject's exact words should be used. Otherwise it could be shown that the person did not understand what he/she signed. It could also be argued that the statement was not made freely and voluntarily.
 - (6) It is preferable for the witness to write the statement, but some people will not want to do this. If they don't, neatly write or print it for them.
 - (7) If the verbiage on the page preceding and/or the page with the signature does not fill the entire page, a diagonal line should be drawn from the line where the statement terminated to the bottom of the page.
 - (8) The statement should be read by the person giving it. If the person cannot read it, the statement must be read to him/her.
 - (9) The interviewee should initial each page of the statement and any corrections.
- B. An unsigned report of interview is used when the person is not a railroad employee. It is also used **if the railroad employee is not providing** "information with respect to an alleged violation of this title, any other Federal railroad safety law, or any rule, regulation, order or standard issued under this title or any other Federal railroad safety law."
- (1) During an accident investigation, if a railroad employee has information about alleged violations but does not want to sign a witness statement, **do not** include this information in the report of interview. Develop the information pertinent to the accident.
 - (2) The report of interview should generally be developed in a chronological sequence.
 - (3) Conduct an initial question and answer session before the report is written. Using your notes, review the pertinent facts and put them in chronological order. If necessary, ask the witness to clarify relevant points.
 - (4) During questioning use plain and simple language.
 - (5) A responsive answer should be obtained before proceeding to the next question.

FRA Suggested Word List

Revised December 2004

Noun: A word that can be used to refer to a person or place or thing. A word that can serve as the subject or object of a verb.

Verb: A content word that denotes an action or a state (the way something is).

Adjective: Any of a class of words used to limit or qualify a noun.

One Word

backup (*noun*), back up (*verb*)

Examples: *The engineer's backup arrived. Back up the train.*

bimonthly

blacktop

brakeman

branchline (*adjective only; i.e. branchline track*)

bulkhead

bylaw, bypass, byproduct

carload

carman

checklist

crossarm

crosslevel

crossover (*noun*), cross over (*verb*)

Example: *The wooden crossover was broken. He will cross over the track.*

crossie

crosstrack

cutoff (*noun*), cut off (*verb*)

Example: *The cutoff point was reached. Cut off that group of cars.*

decisionmaking

downtime

followup (*adjective, noun*)

follow up (*verb*)

Examples: *The followup will begin Tuesday. FRA will follow up on the accident.*

forklift

gage (*noun*) gauge (*verb e.g.- estimate*)

gateway

guardrail

handbrake

handhold

hardhat

headlight

hometown

inbound

One Word (continued)

leadtime

lengthwise

logbook

metalworker

manhour

midday, midpoint

milepost (*but CSX Milepost 79*)

multipurpose, multinational

nearby

northeast

ongoing, onward

outdated, outlook output

overall, overexpenditure, overworked

paperwork

payback (*noun*), pay back (*verb*)

Example: *The safety payback will take too long. Pay back the money.*

percent (*not, per cent or %*)

piecework

pipeline

policymaker

postpaid, postscript

powerplant, powerline, powersite

preadjust, preexist

railhead, railway, railroad

ratemaking

roadmaster

semiannual, semipermanent, semiofficial

shutdown (*noun*), shut down (*verb*)

Example: *The shutdown of the road was complete. Shut down the railroad.*

sideframe

sidewalk

sometimes (*but, at some time*)

stockworker, stockroom, stockyard

systemwide

FRA Suggested Word List

Revised December 2004

One Word (continued)

textbook
timecard, timetable
trackman
trainload, trainstop
trainmaster
transload
transshipment
truckline, truckload
turnaround (*noun*), turn around (*verb*)
**Example: Turnaround time is 12 hours.
Get the men to turn around and
face the equipment.**
twofold, threefold, etc.

waterway, waterfront
waybill
weekday
westbound
widespread
workload, workplace, workday
(but, work force)
worldwide

yardmaster

Two Words

bad order
box car
branch line, (**but, branchline adjective
track**)

car length
coal car
coal mine
crew member
cross section (*noun*) (**but cross-sectional
adjective**)
diesel electric (**but diesel-electric
locomotive**)

en route

flat car

grade crossing
ground work

half way
hazardous materials transportation
(not) hazardous material

joint line

main track (**not main line**)

rail car

short line

No Initial Caps

a.m., p.m. (**4 a.m., not 4:00 a.m.**)
appendix A

chapter 1 column 2
congressional (**congressional action, but
First Congressional District**)

county coroner

departmental

a yard track (**but Yard Track No. 8**)

figure 7

governmental (**but Federal Government**)

highway-rail grade crossing

lead track

main track
mechanical department (**if not exact title**)
midcontinent
mid-July
mile (CSX mile 79.2)
milepost (**but CSX Milepost 79**)

north-central region, (**but, Region 4**)

page 6, paragraph 2
paramedic

region
regional administrator (**but, Regional
Administrator Smith**)

table 6
train order No. 658

volume x

FRA Suggested Word List

Revised December 2004

Initial Caps

Act, the Act (*Staggers Rail Act*)
Advance Notice of Proposed Rulemaking
(*ANPRM*)

Bridge 403
Bristol Station

Calumet River Bridge
Camden main track
Class 1 track
Congress

Department of Transportation, the
Department

Eastern District, Southern District
Engine 987
Extra 769 East

Federal, (*but, federally funded*)
Federal Government, Federal, State, and
municipal governments
Form Q Train Order (*but, the train order
directed...*)

Interstate 95, (*but, the interstate*)

Locomotive No. 220, (*but, locomotive
pantograph*)

Nation
Northeast
Northeastern States, (*but, northeastern
region*)
Notice of Proposed Rulemaking (*NPRM*)

Section 401
State government, State legislature,
statewide, State of Texas, New York State,
Rocky Mountain States, Gulf States, State
and local governments

Title IX
Track No. 4, (*but, 4 tracks*)
Train No. 468
Train Symbol M.VANCAM1-12

U. S. Highway 87

Hyphenate

car-mile
container-on-flatcar (*COFC*)
continuous-welded rail (*CWR*)
cross-reference, cross-section
cut-out valve
double-stack
double-track
end-of-train device
fact-finding (*adjective*)
high-speed
hi-rail (*noun only*) (*not hy-rail or high rail*)
in-service
maintenance-of-way
maintenance-of-structures
mid-1958
north-central region
on-track
out-of-date
passenger-mile
right-of-way
route-mile
ton-mile
trailer-on-flatcar (*TOFC*)
train-mile
up-to-date

Abbreviations

a.c. (*alternating current*)
CWR (*continuous-welded rail*)
FY 1958
TOFC, COFC
16 lbs, 1 lb
4 mph
66 °F
3 ft
2 in
hazmat

Acronyms

The first time you use an acronym in a document, use the full name of the organization or object the acronym describes. Follow this with the acronym in parentheses. From that point on, use only the acronym in the document.

Examples:

Federal Railroad Administration (FRA)
Department of Transportation (DOT)

Symbols

° (for temperature, i.e., 72 °F), but
degree (for track geometry)

§ (for Section)

§§ (for Subsection or Multiple Sections)

Numbers

Use figures for time, distance, weight, money (any type of measurement), and any other number that is 10 or over.

1980's, (*not*, "80's)

15 feet

two cars, 11 cars
5 car lengths

four men
10 men

1-degree 58-minute curve
0.3-percent descending grade

2- by 4-inch boards (*but*, 2 to 6 inches
wide)

5-day week

\$3 (*not*, \$3.00), 75 cents, 0.5 cent

1,000 (*not*, 1000)
12 million (*not*, 12,000,000)
12,658,412 (*not*, 12 million 658 thousand
412)

\$500,000 to \$1 million

one-half inch, (*not*, *one-half of an inch*, or
 $\frac{1}{2}$ inch) but, $\frac{1}{2}$ -inch pipe

**FRA Accident Investigation Guidelines
Job Aids - Table of Contents**

AI Job Aid 01	Go Kit
AI Job Aid 02	First On-scene Accident Investigation Checklist
AI Job Aid 03	Interview Checklist
AI Job Aid 04	S&TC Inspection & Test List
AI Job Aid 05	Collision Checklist
AI Job Aid 06	Train Derailment Cause Finding Guide
AI Job Aid 07	Track Inspector Guidance
AI Job Aid 08	Highway-Rail Grade Crossing Accidents
AI Job Aid 09	MP&E Accident Investigation Checklist
AI Job Aid 10	Fatality Investigation Checklist
AI Job Aid 11	SOFA Appendix G
AI Job Aid 12	FRA Post Accident Drug and Alcohol Testing Criteria Chart
AI Job Aid 13	Cover Memo List of Attachments Checklist

AI Job Aid 01

Accident Go Kit

Be prepared. Since railroad accidents occur at any time, the following is a recommended list of items that should assist you in the investigative process. These items should be readily available to you at all times.

Note: This is a minimum recommended list of items. Your discipline, region or geographical location may require a more comprehensive list of items.

- Credentials and CFR
- First on the scene accident investigation checklist
- First-aid kit
- PC, printer, note pad, printer paper, pens, etc.
- Cell phone & charger
- PPE's (Hard hat, boots, etc.)
- Camera, flashlight
- Measuring tape, chalk
- Copies of F6180.41 & 39, (hard copy or electronic)
- Statement of interview and/or witness statement forms, (hard copy or electronic)
- Appropriate contact phone numbers
- DOT Emergency Response Guidebook (Hazardous Materials)
- Current highway maps of the states within your region
- Current railroad timetables for the accident area

AI Job Aid 02 First on the Scene Accident Investigation Checklist

This checklist is intended to serve as an aid to personnel responsible for investigation and reporting of train accidents. Because of the limited scope of this job aid, it is impossible to cite all of the duties associated to accident investigations, however it does attempt to cover the main items that should be addressed on an initial assessment.

Important: Make Sure the Accident Scene Is Safe to Enter.

1) First Assessment (no more than 30 minutes):

- Quick assessment of accident scene
- Contact senior railroad officer and request:*
- Time of accident
- Initial casualty report
- Initial derailment report
- Damage estimates
- Any haz-mat
- Evacuation
- Emergency responders
- Preliminary cause
- Brief regional office by phone

2) Contact senior railroad officer:

- Event recorder data
- Create witness list
- Toxicology
- Dispatcher audio tapes
- Dispatcher train sheets

3) Train Information:

- Train number
- Train consist
- Haz-mat documentation (when applicable)
- Speed & maximum authorized speed
- Direction of travel (timetable & geographic)
- Number of locomotives
- Number of cars
- Equipment derailed
- Method of operation
- Timetable
- Written authority

4) Investigating the Accident:

Take early note of evidence and obtain:

- Determine point of derailment
- ID first wheel to derail
- Note where lead unit stopped
- Determine wheel action, e.g., wheel climb, drop in gage
- Create witness list
- Take photos
- Sketch accident scene
- Weather conditions
- Position of locomotive controls
- Train crew documents, e.g., signal awareness forms, engineer cert. etc
- Update regional office

5) General:

- Highway vehicles involved
- Highway warning devices
- Locomotive warning devices
- Nearest city or town
- Wayside detectors

6) Rules Infractions:

- FRA regulatory infractions
- ROR infractions

Continued on next page

Investigator in Charge Checklist

- Receive a proper On-Track Safety job briefing from the railroad RWP/OTS Employee-in-Charge before fouling any track.
- Establish where you will be
- Advise team members and regional POC where and how they can contact you
- Make assignments **clear**, e.g.
 - OP Inspector to obtain interviews
 - MP&E Inspector to request and evaluate event recorder data
 - S&TC Inspector to obtain and evaluate signal data
 - Track Inspector to inspect and evaluate
 - HM Inspectors to obtain and report on hazardous materials involvement
- Assign inspector to get initial crew member interviews **immediately**. **Divert** inspectors en route if necessary.
- Assign inspectors to interview dispatcher, roadmaster, carman, signal maintainer and others who may have **played a role** in or been **witness** to the accident. Have the regional POC assist if the dispatcher is in another FRA region.
- Maintain **contact** with your team **at all times**.
- Schedule meetings; hold meetings **at least** daily.
- Maintain frequent scheduled **contact** with the regional POC.
- If other agencies involved, e.g., NTSB, establish who is **IIC** and **cooperate fully**. Report involvement to regions as necessary.
- Each inspector on the team must prepare all inspection reports (96's) for the work performed as well as a narrative report.
- If possible, team members should discuss probable cause prior to departing the accident scene.
- Talk to the Regional Administrator (or his/her designee) before closing down the field investigation.

This checklist is intended to serve as an aid for conducting interviews and is to be used in conjunction with the FRA's *Guide for Conducting Interviews*.

Interviews are critical to FRA's investigative process and overall understanding of the facts leading up to the accident. It is important to keep in mind that FRA considers interviews to be voluntary.

Make certain that you:

- Are prepared for the interview
- Know in advance the questions that you intend to ask, and the information that you are trying to obtain
- Are familiar with pertinent files or documents
- Do not fumble or stumble over questions
- Show credentials
- Maintain professionalism
- Convey the impression that the person's information is important
- Explain the purpose of the interview
- Explain that you are trying to develop factual information, and not out to "get" anyone
- Explain that you may be taking notes and why
- Ask open questions to get the interview started
- Avoid the use of yes/no type questions
- Keep the questions simple
- Talk without lecturing
- Keep the person talking about relative matters
- Avoid arguments
- Avoid "talking down" to the person; carrying the interview at the witness' level

Are your notes:

- Legible
- Dated and show location of the interview
- Identify the person being interviewed
- Identify others present

When investigating accidents/incidents where causal factor may include signal systems:

A complete and thorough inspection of the signal system should be completed to determine if the signal system performed as intended and is in compliance with the RS&I. A narrative may be required explaining functions and events of the signal system prior to the accident. Any abnormality or component failure causing a less restrictive signal aspect than intended will have to be explained in detail. Explain what corrective actions the railroad performed

- Safety Briefings** - Receive a proper On-Track Safety job briefing from the railroad RWP/OTS Employee-in-Charge before fouling any track.
- Description of the Railroad Signal System** - Give a general description of the type of signal system and any associated appurtenances (i.e. ABS, TCS, signal type, track circuit type, switch machine type, etc.)
- Damage to Signal System** - Obtain estimated damage dollar amount to signal system.

When the signal system may be a causal factor, the following items should be performed in the presence of a S&TC inspector by railroad signal personnel.

- Signal Event Recorder** - As soon as possible obtain printouts of any installed event recorders from signal control points, wayside signal locations and failed equipment detectors (FEDs) in the area of the accident. Obtain a printout from the dispatcher's office that shows controls and indications in the area of the accident. Have the railroad provide an interpretation of events with an explanation of any time differences between recorded times and real time. Verify recorder inputs correspond with actual recorder printouts and to circuit plans.

Wayside Signal Systems

- Inspect and test signal system for proper aspects and operation
- Inspect and test all applicable switches, derails, and etc. for proper operation
- Perform time release and locking tests for all routes
- Test relays and electronic devices for proper operating characteristics
- Test cables for required insulation resistance values
- Test for grounds
- Perform shunt tests of all track circuits and verify track circuit equipment detects shunt
- Recreate train movement (use of train or shunts) and inspect for proper system operation
- Measure sight distances of signal aspect previews (if multiple tracks, note obstructions from equipment)
- Obtain and inspect test and inspection records for at least one year back
- Interview maintenance personnel regarding maintenance procedures and tasks performed to signal system
- Other inspections and tests as applicable

Onboard Train Control/Cab Signal Systems

If the accident occurred in a Train Stop, Train Control or Cab Signal System, the following items should be performed in the presence of a S&TC inspector by railroad mechanical or signal employees personnel.

- Inspect condition of onboard equipment (is equipment sealed where required?)
- Test equipment for proper operation
- Inspect and test roadway equipment for proper operation in area of accident and safe braking ensure system provides safe braking distances
- Obtain and inspect test and inspection records of onboard equipment for at least one year back
- Interview maintenance personnel regarding maintenance procedures and tasks performed to equipment
- Other inspections and tests as applicable
- Provide written description of any additional inspection and testing performed

This checklist is intended for use in investigating collisions and derailments for which human factors may be causal. Consider this a memory jogger for developing factual information relative to the accident.

Questions for Offending Train Crew

- Full name
- Position title
- Was your on duty location your home terminal
- Time, date and location (on-duty)
- Hire date
- Promotion date to current position
- Last rules exam date
- Last physical exam date
- Job assignment on day of collision
- Were you working your regular assignment
- Are you familiar with the territory
- Were you fully rested (HOS)
- Hours off duty prior to trip
- Did you participate in a job briefing (SOFA)
- What written authority was in effect
- Do you have a copy of the written authority
- Does your railroad require signal awareness forms to be completed
- Did you complete the forms
- What was your location on the train and what were you doing
- What was the aspect of the last signal you observed
- What was the last radio conversation you heard
- When was your last operating efficiency test
- Did you pass or fail
- Was an air brake test conducted on your train
- If yes, what type and by whom
- Did you receive an air brake certification slip
- Did you make any pick-ups or set-outs enroute

Train Make-up:

- Train make up (i.e., mixed freight, coal, etc)
- What was the train length and tonnage
- Did you receive a train profile
- Were there any hazardous material cars and if so did you receive train placement documentation

Post-Accident:

- Where there any injuries
- What did you do after the accident and who did you talk to
- Where you required to submit to D&A testing
- What time & date were you relieved from duty
- What was your point and time of final release
- What do you think caused the accident
- Length of time operating on the territory where the collision occurred
- For the previous 60 day period, what were the number of days you operated over the territory
- What is the current date of your certification and the date of your last performance test
- How many locomotives did you have and were they all functioning as power units
- Were they all inspected prior to departure
- Were you notified of the operational status of your dynamic brakes
- If so, by whom
- Any exceptions taken to the locomotives
- What kind of locomotive safety devices were on the controlling locomotive
- Any exceptions to the safety devices

- Approaching the accident site explain the details of how you were handling the train
- Any exceptions to the locomotives prior to the accident
- Any exceptions to the way the train handled prior to the collision
- Did you place the train in emergency
- Did you activate the emergency EOT toggle switch (if appropriate)

Additional details to gather copies of:

- Event recorder print out
- Method of operation
- Crew members timeslips
- Test and Observation records for each crewmember for the last 60 days
- Railroad inspection records of track, signals and wayside detectors for last 60 days
- Operating rules involved
- Timetable special instructions involved
- Bulletin Orders involved
- Written authorities for movement
- Track charts
- Verify weather conditions - www.weatherchannel.com

Additional details to gather relative to RCL operations:

- Was the remote control operator properly trained?
- Was a remote control zone in effect in the accident area? If so, were proper procedures followed to establish the zone?
- Was point protection provided when required?
- Could in-train forces be adequately controlled using RCL equipment?

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Train Derailment Cause Finding Guide

Train Derailment Cause Finding

Section II General Investigation Methods

The expertise required to determine the cause of a derailment frequently crosses railroad departmental lines. In most cases, the investigation encompasses several specialized areas such as train handling and operating practices, locomotive and car dynamics, and track geometry. Successful investigation depends largely on the combined efforts provided by officers of the three main operating functions supported by evaluations performed by specialized personnel.

Investigation Committee

For major derailments, it is advisable that a committee be formed consisting of members of Transportation (Operations), Engineering (Track) and Equipment (Mechanical) functions. This Committee, usually consisting of line level officers, will be responsible for collecting the different preliminary information and documents, ensuring that the necessary measurements, photographs and sketches are obtained before the scene is disturbed by repair operations. In addition, train crew interviews and event tapes relative to the operation of the train, should be secured.

It is recommended that the officers sent to the accident scene be provided with the necessary equipment to measure and record evidence found. Officers dispatched to the scene should be provided with proper tools such as: camera, level, measuring tape, 62-foot chord, wheel gages, etc. A recommended list is given in appendix A.

At the scene of the derailment, the officer responsible for all phases of handling of the derailment should also be held accountable for the investigation, but the officer should have due regard for specialized assistance in those areas outside the realm of his or her expertise.

Action Upon Notification

Members of the Investigation Committee should, upon notification of the accident, obtain the following information to assess the course to be followed and data to be collected:

- time of derailment
- train number and direction
- estimate of speed at time of derailment
- subdivision and approximate mile post
- number of cars derailed
- position of derailed cars in train
- train consist
- locomotive units
- Presence of hazardous commodities or other special considerations
- Extent, description of derailment, and remarks from Control Center, dispatcher, and train crew at scene.



An International Government-Industry
Research Program on Track Train Dynamics

Depending upon the nature of the accident, it may be necessary at this early time to supplement the data above by making arrangements to have the following information obtained to enable a more thorough analysis:

Weather: visibility, ground cover, precipitation, temperature, extreme weather factors

Operations: timetable, special instructions, bulletins, train orders, signal indications, train dispatcher sheet, CTC graph, and hot box/hot wheel detector tapes

Track Data: condensed profile, track component description, track geometry data, maintenance history, and inspection reports

Equipment Data: train yard inspection reports, air brake tests, and equipment diagram sheets

Train Data: documentation of train handling, event recorder information, crew interview, witness reports, distribution of tonnage in train, long-short car couplings and location of specialized equipment

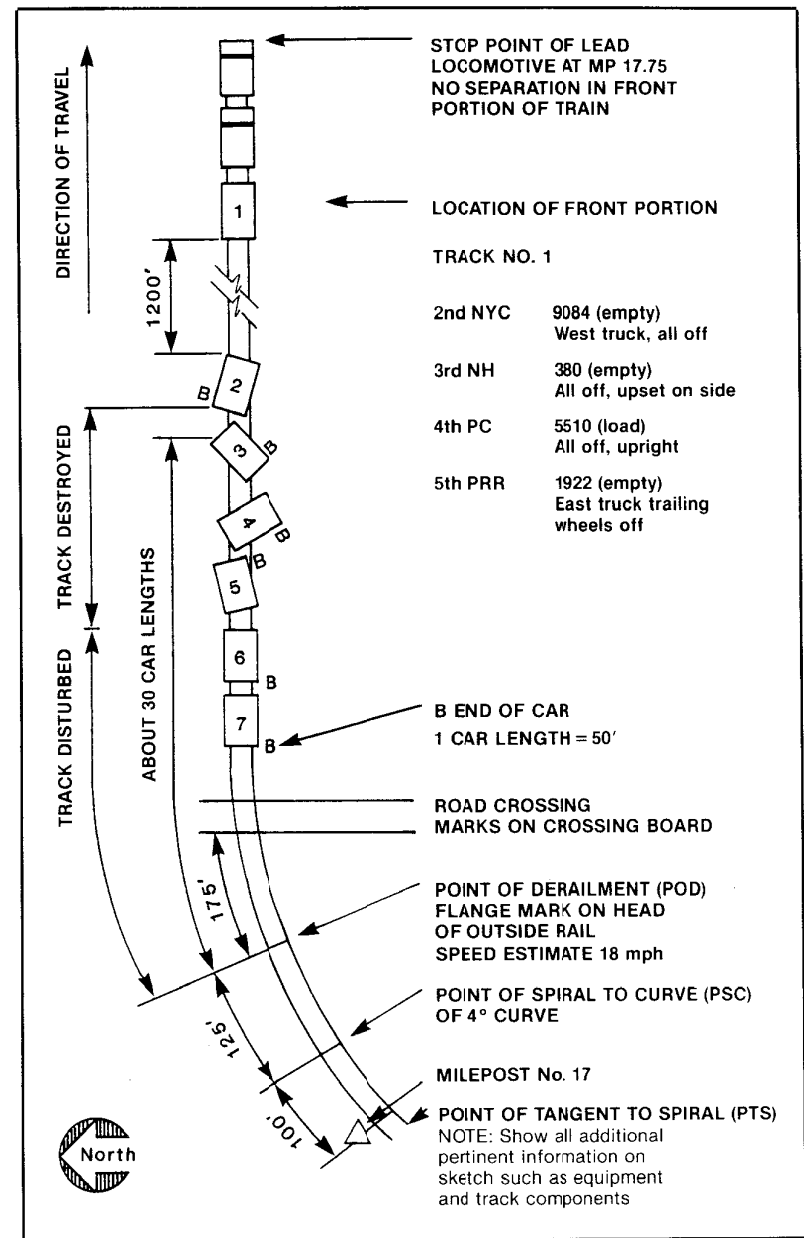
Action on Arrival at Site

After preliminary inspection and individual railroad priorities have been set in motion, a thorough inspection of roadway and equipment must be made by the investigating officers before equipment is moved and work begins. Every effort should be made to determine and mark the initial point of derailment (POD) before equipment is moved.

At this time, a detailed sketch should be prepared similar to that shown in Figure II-1. This sketch should include supporting information such as:

- point of derailment (POD) and first wheel to derail
- position of derailed and adjacent non-derailed vehicles by vehicle initial and number
- orientation of vehicles, whether A or B end leading
- position of wheels in relation to rail
- location of major pieces of car, locomotive, and track components
- relationship of vehicles to physical characteristics of surrounding topography and natural features
- extent of track, signal, and bridge damage, and location of markings on track structure
- location where each portion of train stopped
- direction of travel.

**Figure II-1
Typical Sketch of Derailment**



Point of Derailment and First Wheel

The key to finding the correct derailment cause depends on determining the exact point of derailment (POD) and finding the first wheel to derail. The following approach to determine the exact POD is recommended:

1. Start at the first derailed vehicle.
2. Progressively move opposite to the direction of travel of the derailed train inspecting the roadbed for fresh marks.
3. Trace the markings leading to the initial POD.
4. Sketch wheel flange marks or any other evidence found on ties, rails, ballast or equipment. Show length and direction of marks, spacing, location in relation to rail joints, and if on ties, distance to base of rail. If in a turnout area, show location in relation to switch point, guard rail, and frog.
5. Look for similar marks on ties or a common "signature" that can be traced to the POD from the first car to derail.
6. From the suspected POD, walk back as necessary an additional distance opposite to the direction of travel of the derailed train looking for dragging equipment, failed equipment or track components, signs of damage from shifted lading striking wayside structures or displaced lading from the derailed train.

If the track has been destroyed by the pile-up and the exact POD is not readily apparent, an attempt must be made to observe the direction of available wheel marks, ties with similar marks, spread rails, marks on track components, and plowed earth. The direction of these markings will often "point" toward the approximate location of the exact POD. It is important to determine this approximate location in order to facilitate further analysis as more information is gathered. Damaged rail should be marked and position where found noted to later assist in establishing where each rail fit in original track structure.

The following approach to determine the first wheel to derail is recommended:

1. Examine the wheels and underside of derailed equipment in search of those that show the most severe flange or abrasion damage.
2. Evaluate ballast marks, anchor couges, rail scuffs on the wheel flanges, tread and face, noting them on the sketch. It is helpful to rate the severity of the marks on a scale from 1-10. Generally, the wheel with the greatest severity of markings will have been first to derail.
3. Do not overlook the possibility that some wheels may have re-railed themselves. Check as many vehicles ahead as necessary to eliminate this possibility.

It should also be remembered that the first wheel to derail does not always belong to the most forward derailed vehicle. A leading vehicle is occasionally "pulled off" by a trailing derailed vehicle. If, however, this most forward derailed vehicle is not identified as the vehicle causing the derailment, a logical explanation should be provided as to how the cars derailed preceding the one causing the derailment.

Photographic Record

Photographs are extremely useful in determining the cause of a derailment. It is important that photographs be taken as soon as possible after the investigating officers arrive at the site.

Photographs should be taken and properly identified as related to the site sketch. Photographs should show:

- Visible evidence which may relate to the cause
- Markings on track and equipment
- Overview of the derailment site and/or aerial photographs
- Sequence of photographs simulating the view of the locomotive engineer approaching the derailment site
- Detail conditions of track and equipment in areas where repair work will disturb the derailment site and evidence
- Close up view of wheels and rails at proper angle to show the condition of wear.

Special photographic techniques such as enlargements may be useful in making wear measurements and evaluating fracture surfaces. Use a scale or a reference point in the photographs to demonstrate size relationships. As a general rule, the investigating officers should be encouraged to take more photographs than apparently needed.

Conducting the Initial Investigation

It is understood that it is not practical nor desirable to investigate every aspect in every derailment. Unless the exact cause of the accident is clearly apparent, it is proper at this point for the Investigation Committee to share opinions as to the probable cause area of the derailment in order to limit the scope of the investigation. When the cause area is readily evident, attention should be directed to the appropriate section of this manual. When the cause area is not readily evident, a process of elimination may be used.

It is essential, however, that the Investigation Committee keep an open mind and be willing to backtrack if new evidence comes to light. For this reason, care should be taken to ensure that data which might be destroyed during cleanup operations is collected and preserved to cover this possibility.

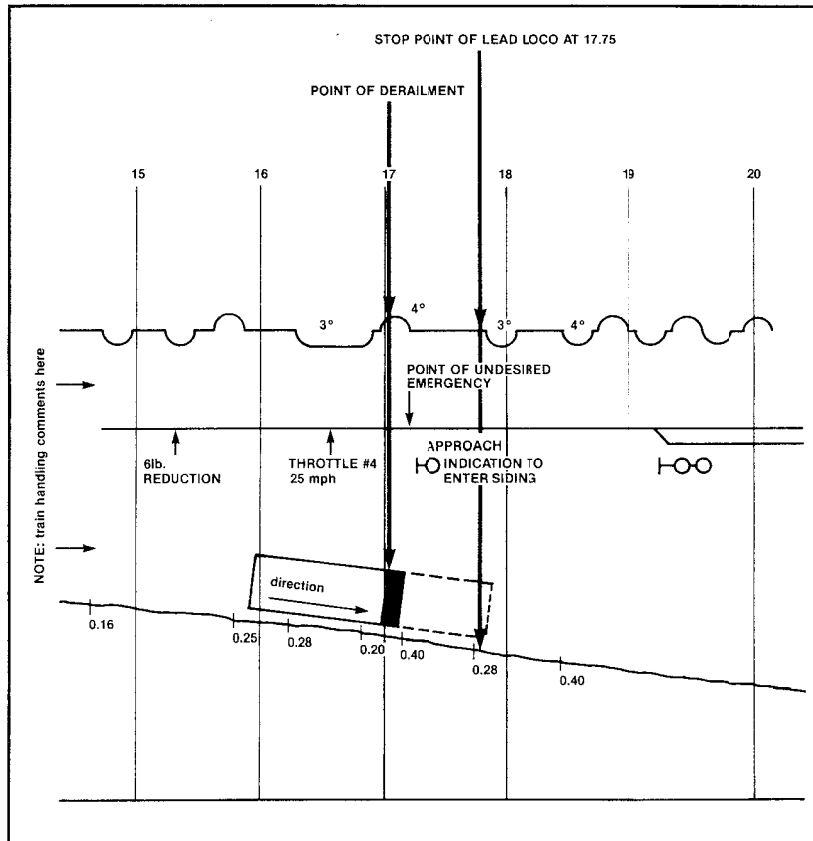
Visualizing the Derailment

Considering the circumstances prevailing at the time of the derailment, the investigators must "visualize" how the derailment first occurred and how the resulting pile-up developed. The following items should be considered in this evaluation:

- Direction of travel: locomotive pushing and/or pulling
- Track layout: curvature, tangent, switches, grade crossing, etc.
- Train speed, train make-up, motive power consist, and condition of slack
- Day or night operation
- Type of equipment and commodity loading
- Position and identity of the vehicle and wheel that was first to derail.

Another recommended approach consists of superimposing the derailed train on the track gradient profile as illustrated in Figure II-2.

Figure II-2
Track Gradient Profile Noting Events Related to Derailment



This Train Handling Profile shows where the entire train was located at the time of the derailment. Note that the first derailed vehicle is aligned with the initial POD. It then becomes simpler to visualize the possible influence of gradient, curvature, train make-up and train handling while the train was progressing toward the POD. It also assists in evaluating the possibility of significant buff or draft forces being present in the couplers of the first vehicles to derail at the point and time of the derailment.

Evaluating Markings

Expert reading and interpretation of marks found at the initial POD constitutes the most valuable contribution to the resolution of the cause. There are a number of well recognized cause-effect relationship situations that can be used as a guide in determining a cause area to concentrate the investigation.

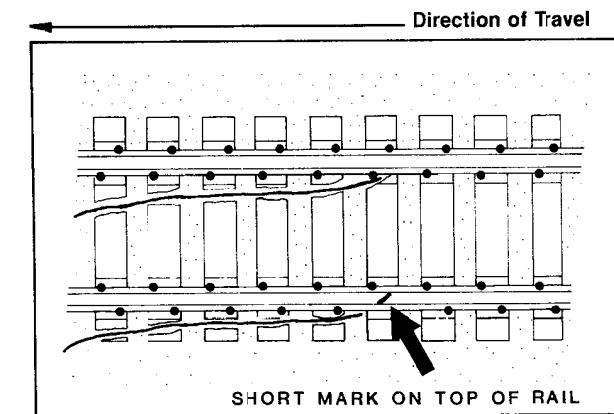
Usually, one of the following situations can be found.

Marks on Rail

Figure II-3

Short marks across top of rail caused by wheel flange: Such short marks, perhaps less than 24 inches long, indicate that the force causing the vehicle to derail was severe. There will be evidence within a short distance of the marks on the rail where the wheel struck the tie, tie plate, top of spike, end of joint bar, top of guard rail, etc.

Figure II-3



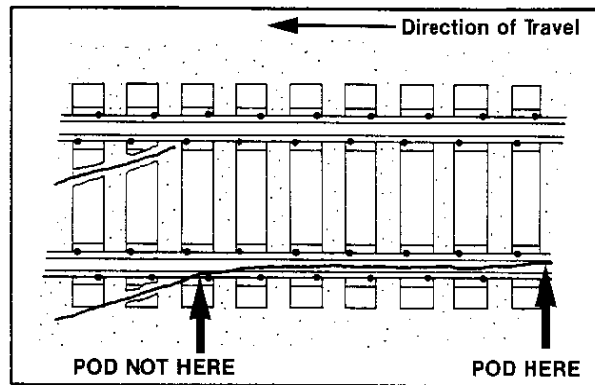
Possible causes include:

- slack action induced by a train handling error
- heavy drawbar pull
- foreign object under train
- component failure
- sudden load shift
- truck hunting.

Figure II-4

Extended marks on top of one rail caused by wheel flange: Such marks denote that the derailment forces were sufficient to overcome normal tracking of the car. Flange marks may extend as much as 25 feet or more before there is evidence on ballast, rail base, anchors, tie plates, or tie where wheel dropped off. When defining the POD, show the POD at the point where the wheel left its normal running position, not where it dropped off the rail.

Figure II-4



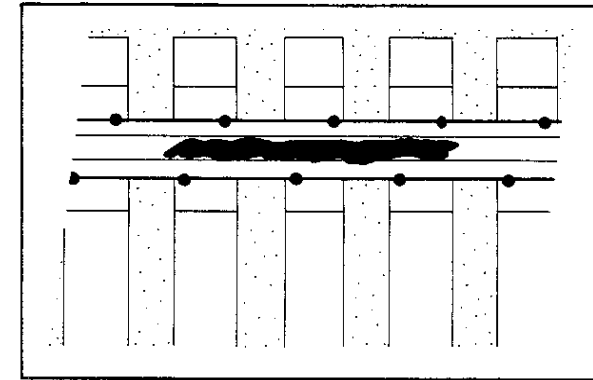
Possible causes include:

- irregularities in cross level
- irregularities in track alignment
- excessive speed
- excessive or no lateral clearance in truck
- shifted load
- binding of truck slew action (stiff truck)
- car rocking action
- characteristics of truck suspension and side bearings.

Figure II-5

Marks indicating abrasion: This type of mark is usually the result of a wheel that is sliding or slipping on the rail.

Figure II-5



Possible causes include:

- sticking brakes
- hand brake applied
- flat wheel
- loss of adhesion by locomotives
- locked wheel on locomotive
- dragging equipment.

Figure II-6

Marks occurring at regular intervals: Such marks are usually caused by a broken wheel. With each revolution of the wheel, the sharp edge of the break nicks the rail. These marks are spaced at distances equal to the circumference of the wheel.

Figure II-6

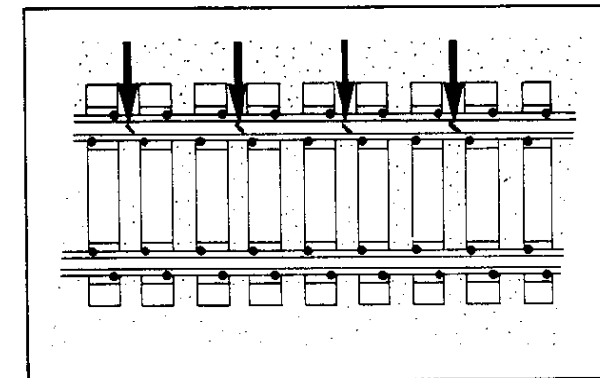
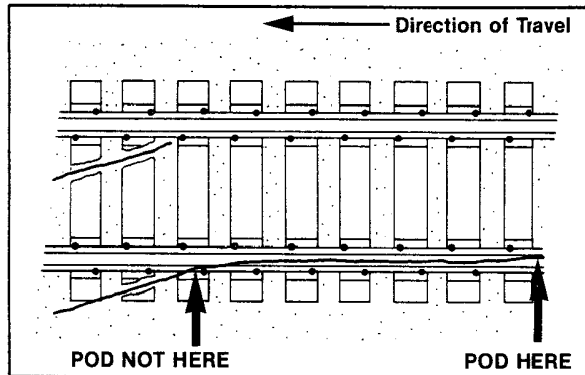


Figure II-4

Extended marks on top of one rail caused by wheel flange: Such marks denote that the derailment forces were sufficient to overcome normal tracking of the car. Flange marks may extend as much as 25 feet or more before there is evidence on ballast, rail base, anchors, tie plates, or tie where wheel dropped off. When defining the POD, show the POD at the point where the wheel left its normal running position, not where it dropped off the rail.

Figure II-4



Possible causes include:

- irregularities in cross level
- irregularities in track alignment
- excessive speed
- excessive or no lateral clearance in truck
- shifted load
- binding of truck slew action (stiff truck)
- car rocking action
- characteristics of truck suspension and side bearings.

Condition 2

If flange marks are found between the rails or there is only one flange mark, possible causes include:

- broken wheel
- broken axle in between wheel seats
- loose wheel.

Figure II-8

One rail rolled or pushed out of gage: Flange marks are found inside one rail with the other rail rolled or pushed out of gage.

Possible causes include:

- excessive speed
- broken rail
- lateral restriction to vehicles negotiating curve
- truck hunting
- wide gage (tie condition, fasteners, etc.)
- irregularities in track alignment
- high coupler forces.

Figure II-8

One Rail Rolled or Pushed Out of Gage

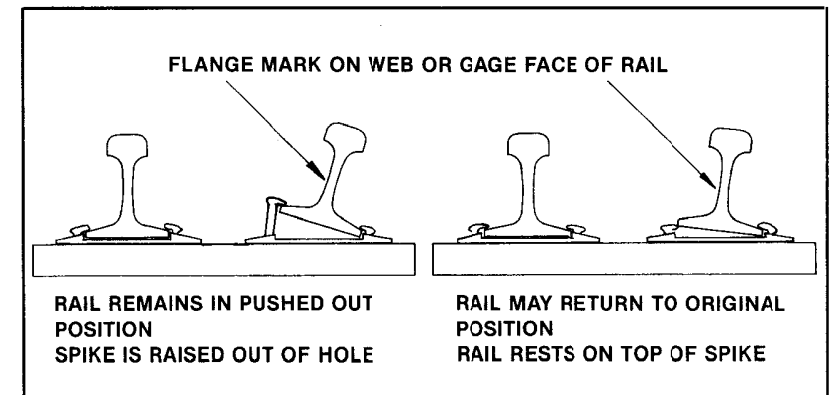
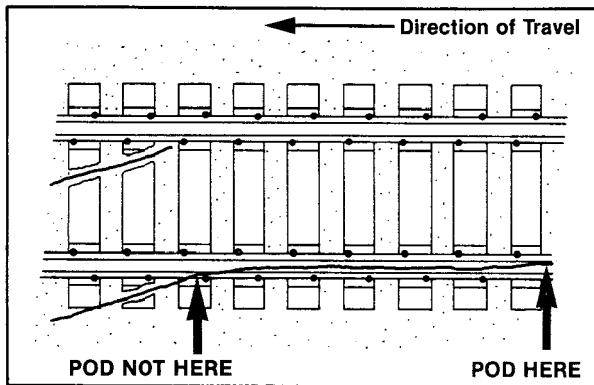


Figure II-4

Extended marks on top of one rail caused by wheel flange: Such marks denote that the derailment forces were sufficient to overcome normal tracking of the car. Flange marks may extend as much as 25 feet or more before there is evidence on ballast, rail base, anchors, tie plates, or tie where wheel dropped off. When defining the POD, show the POD at the point where the wheel left its normal running position, not where it dropped off the rail.

Figure II-4



Possible causes include:

- irregularities in cross level
- irregularities in track alignment
- excessive speed
- excessive or no lateral clearance in truck
- shifted load
- binding of truck slew action (stiff truck)
- car rocking action
- characteristics of truck suspension and side bearings.

Supplementary Investigation Techniques

To thoroughly analyze a derailment, it will sometimes be necessary to consult specialists. The following is a list of possible areas of expertise:

- acceleration and stopping distance calculations
- train performance calculations
- train operation simulation
- evaluation of event recorder tapes, CTC penograph and hot box/hot wheel detector charts
- field tests
- track train dynamics analysis.

Laboratory Analysis

When examining track and rolling stock for defects, it is important to consider whether the visible damage is, in fact, the cause of the derailment or is the result of the derailing action. When findings indicate track or mechanical component failure, examine breaks in metal for old flaws. Depending on the circumstances, the Investigation Committee may determine that it is necessary to know if the metal was within specifications, whether there was evidence of internal flaws, or whether the stresses had exceeded the strength of the metal. Pieces of the broken component (knuckle, coupler, rail, joint bars etc.) may be forwarded to a test laboratory for analysis. The pieces should be clearly marked and all supporting data submitted. Fracture surfaces should be protected as recommended in Appendix B.

Section V

Track Structure

General

During the preliminary stages of the investigation, theories regarding the probable cause of the derailment will have been developed. If it is suspected that failure of a component of the track structure or deviations in one or more parameters of the track geometry caused or contributed to the cause, further investigation into the appropriate area is required. For convenience of the Investigation Committee, therefore, this section has been arranged into these two broad areas.

Track Components

This sub-section deals with the components of the track structure. Defects can and do develop which cause derailments. A look at each of the components is reviewed.

1. Rail

When rail failure is suspected, the state of stress (working condition and traffic in million gross tons, MGT) must be considered or misleading conclusions may be drawn. Important items to be noted are:

- Weight, section and manufacturer
- Metallurgy, including type of steel and/or heat treatment
- Date rolled
- Jointed or welded
- Whether transposed or not
- Unusual incidence of past failures
- Dates of most recent visual inspection, non-destructive rail testing and last work performed
- Rail base polishing pattern from tie plates and anchors
- Curve wear and flow
- Shelling
- Head checks
- Battered rail ends
- Flattened or corrugated rail head
- Corrosion, pitting or nicks in rail base
- Impact damage to rail anchors
- Bolt hole elongation
- Wheel marks or burns
- Longitudinal rail movement

The ends of a broken rail should be inspected for batter and rust, with the probability that the rail broke after the wheels left the rail if batter and/or rust are not present. In this case, the broken rail was the result rather than the cause of the derailment.

In pull-apart and buckled track type derailments, dates when the rail was laid, adjusted and worked upon within the last 30 days are needed. In addition, the temperature when the rail was laid and last adjusted may be required.

Nearly all fractures causing derailments are fatigue failures. Care must be taken during inspection of the fracture to protect both mating surfaces from further damage and contamination. When in doubt concerning fracture interpretation, specimens should be sent to a reliable metallurgical laboratory for analysis. Refer to Appendix B for instructions on the analysis, care and handling of fractures. Appendix E should be consulted for examples of typical rail defects.

2. Ballast

Determine the following:

- Type
- Size
- Depth under tie
- Width beyond end of tie
- Distance below top of tie
- Section in cribs
- Condition—evidence of swinging, pumping or center bound ties including amount of contamination.

3. Ties

Important items to be noted are:

- Kind—hardwood, softwood or other
- Length
- Cross section
- Number per panel (give panel length if other than 39 feet)
- Condition—evidence of splitting, plate cutting, loss of rail cant or slewing.

4. Tie Plates

Determine:

- Type—single shoulder, double shoulder or no plates at all
- Size
- Condition
- Cant, such as 1 in 14, 1 in 30, 1 in 40.

5. Spikes

Factors that must be considered are:

- Type—cut, lock
- Number and arrangement along each rail
- Length
- Condition—evidence of deformation
- Penetration—evidence that spikes are not settled at rail base and if high, determine how high, how many and location.

6. Anchors

Determine the following:

- Type
- Pattern
- Number per panel
- Condition
- Effectiveness, that is, whether against ties and, if not, determine distance away from tie, how many and location along rail
- Evidence of rail creep or buckling.

7. Bolts

Determine:

- Number per joint
- Condition—loose, broken or missing

8. Joint Bars

Important items are:

- Type
- Length
- Number of holes
- Condition—cracked, broken, missing.

9. Gage Rods

Look for:

- Number per panel
- Kind—insulated or non-insulated.

10. Subgrade

Factors of importance include:

- Depth of cut
- Depth of fill
- Soil type
- Stability
- Position of sidehill
- Type of terrain
- Evidence of moisture
- Drainage.

11. Rail Joints

A derailment can occur at rail joints due to the two rail ends not lining up properly, called a mismatch joint; failure of a component, such as broken joint bars; and, being low in relationship to the center of the rail, thereby causing problems in the tracking characteristics of the equipment. Illustrations of a typical rail joint and mismatched joint are shown in Figures V-1 and V-2, respectively. The possibility of a derailment occurring because of a low joint is treated under the Track Geometry sub-section.

Figure V-1
Typical Rail Joint-Cross Section

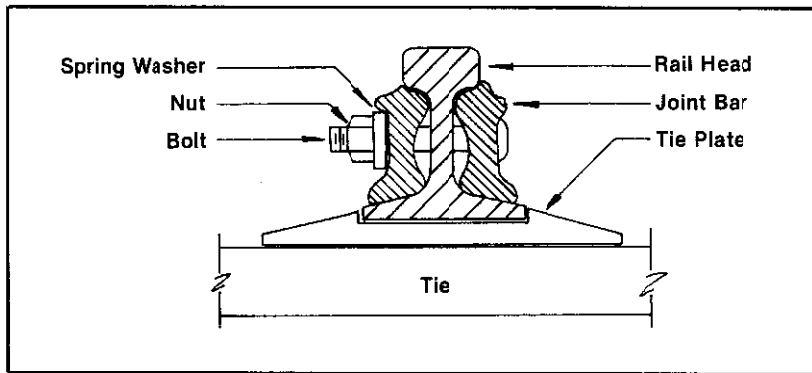
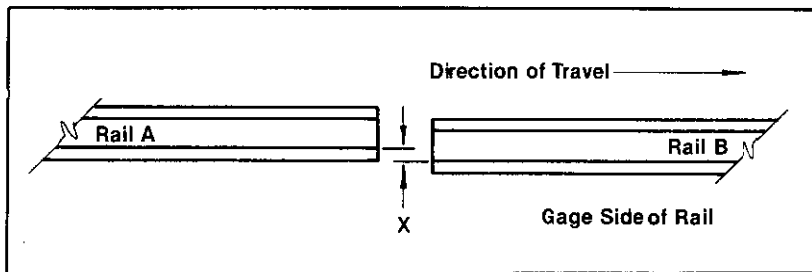


Figure V-2
Mismatched Rail Joint-Top View



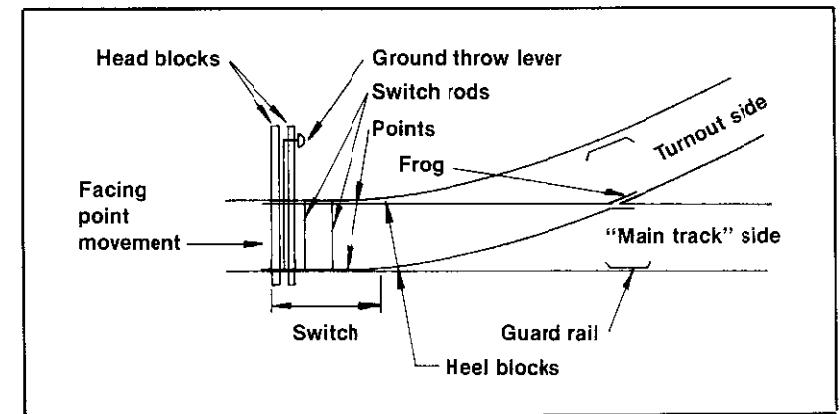
When the POD is suspected as having occurred near a joint, look for:

- Inside and/or outside joint bar broken between center bolt holes causing a mismatched joint
- Less than two bolts in one joint
- One rail end unbolted
- Piece of rail head broken out
- Bolt hole elongation
- Broken bolts, which may indicate poor tie support
- Rail broken through bolt holes and rail loose
- Battered rail ends.

12. Turnout

A derailment sometimes occurs at a turnout. For a better understanding of the discussion on these type derailments, refer to Figure V-3.

Figure V-3
Turnout Diagram



If a turnout is involved, the following items should be noted:

- Turnout number
- Type—handthrown, power operated, spring switch, equipped with an electric lock
- Type and length of switch points—standard, undercut, manganese tip
- Type of switch stand
- Type of frog—rigid, spring, self-guarded
- Tie condition
- Non-standard components
- Evidence that turnout has been run through

A derailment of a turnout usually occurs in a facing point movement. For derailments at or shortly behind the switch points, look for:

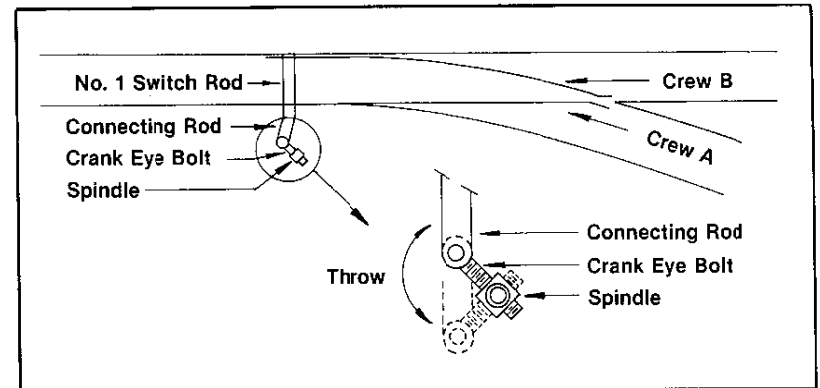
- Run through switch, possibly by crew involved in derailment or by a previous crew with switch improperly lined
- Blunt, worn or broken switch point
- Switch out of adjustment
- Lost motion, or "play," in throw mechanism
- Switch thrown during move
- Cocked switch
- Object in switch points
- Worn switch point against new stock rail
- New switch point against worn stock rail
- Improperly set rail braces
- Inadequate rail support at heel block, resulting from such items as batter, wear, loose bolts and swinging ties
- Unsound or spike-killed ties under the switch plates permitting points to bend under one set of wheels sufficiently to cause tip of point to pull away from stock rail and be struck by the following set of wheels
- Inadequate tie support permitting points to move sideways
- Improper gage, especially at switch points and/or heel block, if present
- Defective and/or loose rail braces, joint fastenings, filler bolts, switch rods and connecting rod
- Vertical wheel flange or false flange
- Broken wheel
- Combination of vertical flange and chipped switch point

For derailments at, or shortly past the frog point, look for:

- Broken or worn frog point
- Loose or improperly located guard rail
- Object in frog throat
- Improper hold down clearance for spring frog
- Improper clearance or flangeway obstruction for self-guarded frog
- Restriction between running rail and guard rail.
- Excessively worn flangeway
- Improper gage, especially at frog point
- Defective and/or loose frog plates, joint fastenings and bolts
- Broken wheel

The Investigation Committee can usually determine the direction that the equipment was moving through an improperly lined switch. Movement through a switch equipped with a rigid stand damages the switch mechanism with a possible derailment occurring on the return facing point move. By referring to Figure V-4, the switch spindle will be twisted and/or the switch stand pulled loose from the ties if Crew A ran through the switch.

Figure V-4
Determining Direction of a Run-Through Switch



If Crew B did not line the switch properly for its move, the connecting rod and/or switch rods will be bent.

At turnouts equipped with safety switch stands, continually running through the switch may cause the switch to either throw over spontaneously or fail to complete its cycle due to excessive wear of internal parts. An inspection of the parts is required under these conditions.

Some turnouts have power operated switches which can be operated by hand and from a remote location. When a derailment occurs at this type switch, the Investigation Committee should determine the relative position of the power and hand throw levers. The switch points should also be examined to determine if they were properly engaged.

13. Derails

In the case that a derailment occurs because a derail is not performing its desired function, the derail has probably not been installed according to the railroad's standards or maintained adequately. Use of the correct size derail for the rail section and good ties, properly spiked, are necessary.

Track Geometry

The Investigation Committee may find indications that deviations in track geometry either caused or contributed to the derailment. In that case, details on the theoretical alignment, grade and vertical curve characteristics, and field measurements of specific parameters which portray the actual track geometry conditions in the immediate area of the POD are required. For convenience, this sub-section is divided into five items—Parameters, Defects, Track Measurements, Track Notes and Derailment Records.

1. Parameters

Deviations exceeding the railroad standards should be identified for each of the following parameters:

- Gage
- Alignment
- Cross level, particularly excessive cross level, excessive rate of change in cross level on spirals, high twist or warp and inadequate superelevation on curves
- Surface

One or more parameters should be considered as a possible or contributing cause if the measured value exceeds the railroad's standards. Suggested limiting values are given in Appendix F.

2. Defects

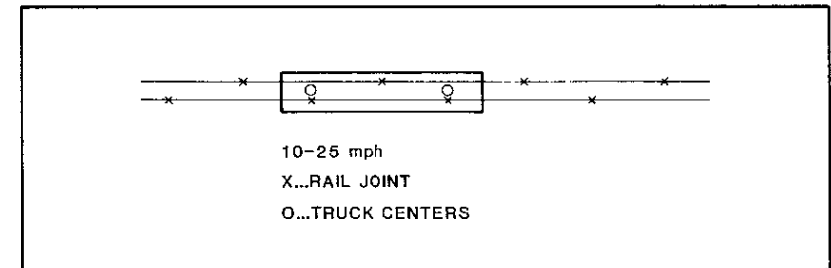
The more common track geometry defects that cause or contribute to a derailment are:

- Gage—If wide gage is suspected, investigate spike condition and plate action on tie surface for evidence of gage widening under load and returning to normal when in an unloaded state. In addition, look for marks on rail head indicating edge of wheel rim or flange riding on or crossing over top of rail.
- Cross Level—Wheel lift or wheel climb type derailments can be caused by an irregularity in the elevation of two rails if the irregularity occurs in too short of a distance. Low joints which are staggered along the length of track and an excessive rate of change in the varying amount of elevation along the length of a spiral are two problem areas.

Incidents involving the suspected tracking characteristics of the equipment, such as "rock off," vertical bounce, wheel climb and "warp off" type derailments, are associated with excessive change in cross level. "Warp off" refers to a situation where the cross level change between trucks of an individual piece of equipment is too great to be absorbed by the suspension and flexibility of the equipment, thus causing a wheel to climb the rail.

Rock and roll type derailments occur when the distance between truck centers is about the same as the length of the rail between joints. Figure V-5 illustrates this relationship.

Figure V-5
Relationship of Truck Centers to Rail Joints



If a car with a high center of gravity is traveling at a speed such that its trucks are directly over successively low joints at the same time as the car rocks to the side of the low joints, the rocking will become more and more severe until the wheels on the opposite side of the low joints lift off the rail. The speed at which wheel lift occurs is between 10 and 25 miles per hour. Tests indicate that lift can occur as early as the third rail joint when the cross level deviation is $\frac{3}{4}$ -inch, or more, when measured under load. Derailments from this cause may occur on welded rail where the rail has assumed a jointed rail condition from the "memory" at the former joints. Refer to Section VI Track Train Dynamics for additional information on this subject.

3. Track Measurements

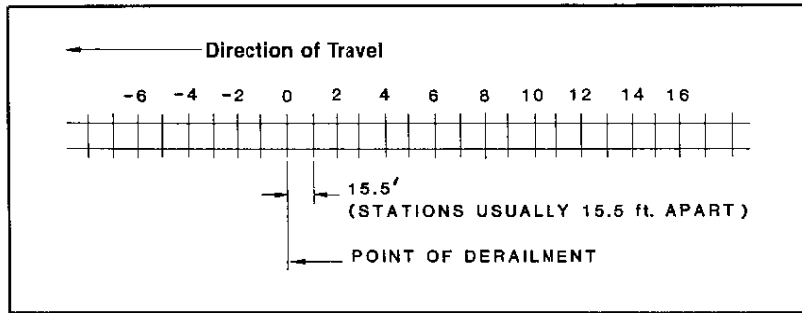
Whenever excessive change in cross level, irregular cross level, major deviation from uniform profile, exceptions from standard gage and excessive or inadequate superelevation may have caused or contributed to the derailment, measurements of the actual conditions need to be obtained for comparison with the railroad's standards.

Definite procedures for obtaining the measurements and displaying the results on an appropriate plan must be established. Suggestions on these important aspects of the investigation follow.

Measurements should be obtained over a distance of at least 300 feet ahead of the POD and extend 100 feet beyond the POD unless the track has been seriously disturbed. The measurements should be recorded under loaded conditions, if possible, by spotting a loaded car at each station or joint. In case unloaded measurements are obtained, allowance should be included for the additional deflection that occurs with load.

Stations need to be marked along the track uniformly, usually every 15'-6" as shown in Figure V-6. In case the 15'-6" spacing does not correctly relate the existing situation, such as measurements at joints in jointed rail territory, another stationing distance may be selected for supplementing the basic information. Data from both sets of distances should then be obtained.

Figure V-6
Stationing for Track Notes

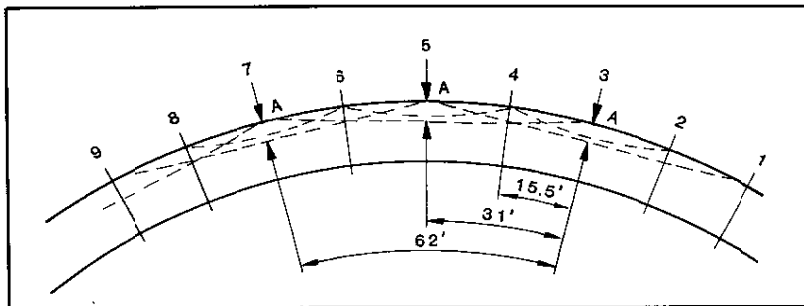


The following procedures should be followed when obtaining measurements on these parameters:

- Gage—Determine the gage at each 15'-6" station. Gage is measured between the heads of the rails at right angle to the rails in a plane $\frac{5}{8}$ inch below the top of the rail head.
- Alignment—The existing track alignment is used to determine amount of deviation from theoretical curved alignment; whether superelevation was sufficient for the actual speed of the train, if the derailment occurred on a curve; and, for variation from a straight line in case the derailment occurred on tangent track.

String line methods may be followed in obtaining alignment measurements using the same stations as noted for gage. A 62' cord and rule are needed for these measurements. By stretching a cord taut between two points, $\frac{5}{8}$ inch below the rail head and 62 feet apart, the distance between the rail head and the cord at its mid length is equal, in inches, to the degree of curve. This measurement is shown as Dimension "A" in Figure V-7. The same procedure, except the ends of the cord are held along the line rail, is used for determining variations in tangent track.

Figure V-7
Check of Alignment by String Line Method



- Cross Level—Usually, measurements should be taken at regular 15'-6", 31'-0" or 62'-0" increments. Incidents involving the suspected tracking characteristics of the equipment require measurements at rail joints, or at the points where joints were once located in the case of welded rail. In these cases, both sets of measurements, that is, at the normal 15'-6" increments and at the joints should be obtained.
- Superelevation—Whenever a wheel-lift, wheel-climb or rail-rollover type derailment occurs on a curve, the amount of "unbalanced elevation" needs to be calculated using the actual speed of the train at time of the derailment, the existing degree of curve as determined by the string line method explained above and the measured superelevation. The amount of "unbalanced elevation", as determined by the following formula, should not exceed 3 inches.

$$E_U = 0.0007_d \times V^2 - E_2$$

Where E_U = calculated "unbalanced elevation", in inches

d = degree of curve, in degrees

V = actual speed of train at time of derailment, in miles per hour

E_2 = actual superelevation, in inches

4. Track Notes

An example of the required track notes is shown in Figure V-8.

As shown, the cross level difference between the measurements at Stations -4 and 0 is $+2\frac{1}{2}$ inches ($-\frac{3}{8}$ " - $(+2\frac{5}{8}$ ")), and between Stations 0 and +4 is $1\frac{1}{8}$ inches ($+2\frac{5}{8}$ " - $(+1\frac{1}{2}$ ")). The difference of $2\frac{1}{2}$ " is excessive for a speed greater than 25 mph as shown in the Track Surface Table in Appendix F.

Alignment deviations, or change in midordinates, between Stations +6 and +10, and between Stations +7 and +11, are $2\frac{1}{2}$ inches (3 " - $\frac{1}{2}$ "") and 2 inches ($3\frac{1}{2}$ " - $1\frac{1}{2}$ "") respectively. By referring to the Alignment Table in Appendix F, the deviations are excessive for a speed greater than 25 mph.

The maximum gage shown in the above example is $1\frac{1}{8}$ " wide and occurs at Station 0. Since Station 0 is on tangent track, the gage is excessive for a speed greater than 10 mph according to the gage table in Appendix F.

For studying the effect of combination defects, various measurements may be plotted for visual scanning. Figure V-9 is an example of plotting gage cross level and top of rail elevations.

Figure V-8
Derailment Track Notes-An Example

Mile Train Travel Sta.	Elevation Measurements (Successive Levels)		X- Level Variance (ft.)	Hard X-Level in 62'	X- Level Differ. in 62'	EXAMPLE: DERAILMENT TRACK NOTES (Successive Spreads 1/4 & 3/4 ft apart)		Remarks
	Low Rail (ft.)	High Rail (ft.)				Gage	Mid- Ordinate	
-6	121.00	121.01	+01	+ 1/8"	56-1/2"	0		
-5	121.05	121.05	.00	0	"	0		
-4	121.15	121.12	-.03	- 3/8"	"	1/2"		
-3	121.21	121.22	+01	+ 1/3"	"	1/4"		
2	121.24	121.24	.04	+ 1/2"	"	1/8"		X-Level
-1	121.27	121.37	+10	+1-1/4"	57"	0		X-Level
0	121.29	121.47	+18	+2-1/8"	57-5/8"	1/2"		X-Level Pt. of Derailment
1	121.31	121.31	.00	0	57-1/4"	1/8"		NSI
+2	121.34	121.34	.00	0	56-3/4"	0		
+3	121.37	121.39	+02	+ 1/4"	"	3/8"		
4	121.42	121.46	+04	+ 1/2"	56-1/2"	1/4"		
+5	121.47	121.53	+06	+ 3/4"	"	5/8"		
+6	121.53	121.60	+07	+ 7/8"	"	1/2"		
+7	121.57	121.65	+08	+ 3/4"	56-5/8"	1-1/2"		
+8	121.62	121.72	+10	+1-1/4"	56-3/4"	1-7/8"		Lines Variance
+9	121.67	121.80	+13	+ 3/4"	"	2-1/4"		Lines Variance
+10	121.73	121.86	+13	+1-1/2"	"	1"		
+11	121.78	121.93	+15	+1-3/4"	56-3/8"	3-1/2"		
+12	121.95	122.15	+20	+2-3/8"	"	3-1/4"		
+13	122.00	122.19	+19	+2-1/4"	"	3-3/4"		
+14	122.10	122.29	+19	+2-1/4"	56-7/8"	3-3/8"		
+15	122.17	122.34	+17	+2"	56-1/2"	2-3/4"		
+16	122.22	122.39	+17	+2"	"	1"		P.C.S.

5. Derailment Records

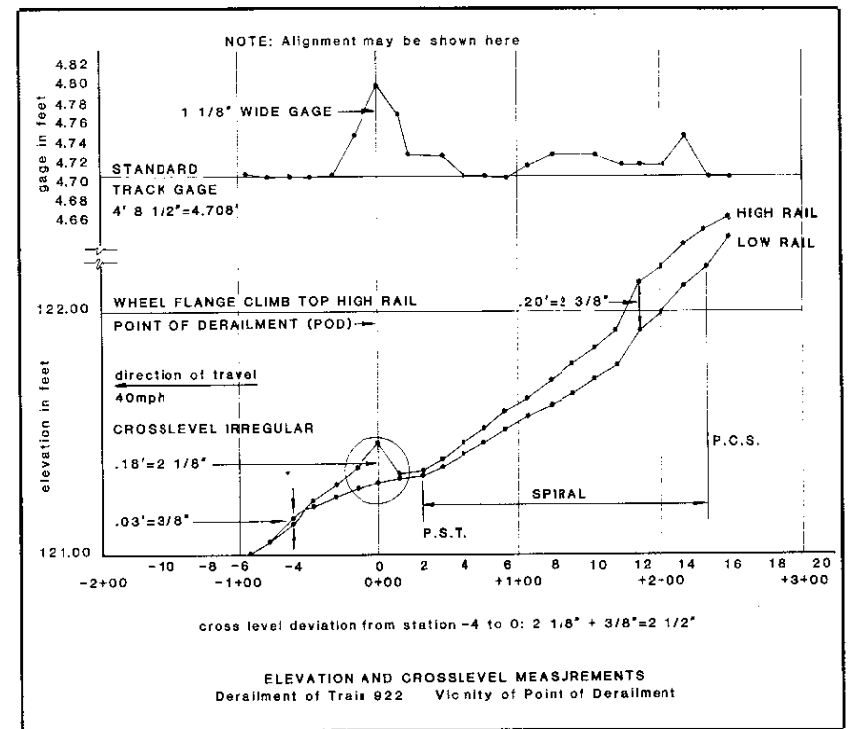
The following information is required as soon as possible after the derailment for those accidents whose cause is suspected of being related to either track geometry or track train dynamics:

- Site plan, drawn to a recommended scale of 1" = 100'. If consistent, the plan should extend 1,000' preceding and 500' past the POD.

The location of all derailed equipment with respect to the track should be shown at an enlarged scale, if necessary for clarity, along with any special observations.

The Investigation Committee may find it desirable to include on the plan field measurements referred to above and as shown in Figure V-9.

Figure V-9
Plot of Cross Level, Gage and Top of Rail Elevations



- Gradient and alignment profiles, drawn to a recommended scale of 1" = 20' vertical. These profiles should extend at least three miles preceding and one mile past the POD. The authorized speed for the territory along with permanent and temporary speed restrictions should be indicated.
- Copy of most recent results from operation of track geometry

car, if available, showing surface of both rails, cross level, gage, twist and alignment. The data should extend from one mile preceding the POD to one mile past the POD.

- Report indicating work performed on the track in the vicinity of the PCD since the last track geometry car inspection.
- Report showing date, time of day, method and condition observed during the latest track inspection by each of the following:
 - Trackmen
 - Track Foreman
 - Track Inspector or Track Supervisor
 - Roadmaster
 - Other persons, if more recent than by above personnel.
- Description, nature and location of any marking on ties, rails or fastenings that appear to relate to the cause of the derailment. The longitudinal and/or lateral movement of the rail should be indicated.
- Photographs, where practical and when they can aid in the description or understanding of the derailment.

Receive a proper On-Track Safety job briefing from the railroad RWP/OTS Employee-in-Charge before fouling any track.

TRACK COMPONENTS

If a track component is suspected of contributing to the derailment cause consider obtaining the following information.

Rail:

- Rail identification (found imprinted on the side of the rail)
- Weight, section, manufacturer, date rolled, heat treatment
- Metallurgy, including type of steel and/or heat treatment
- Jointed or welded
- Whether transposed or not
- Unusual incidence of past failures
- Dates of most recent visual inspection, non-destructive rail testing and last work performed
- Rail base polishing pattern from tie plates and anchors
- Curve wear and flow
- Shelling
- Head checks
- Battered rail ends
- Flattened or corrugated rail head
- Corrosion, pitting or nicks in rail base
- Impact damage to rail anchors
- Bolt hole elongation
- Wheel marks or burn

The rail ends should be inspected for fracture chevrons, batter rust and defect growth rings. If none are present, the broken rail may have been a result rather than a cause of the derailment.

The ambient temperature variances and time of day should be noted in pull-apart and buckled track type derailments. Also, record the date and time of day the rail was laid, adjusted and worked upon within the last 30 days. In addition, the temperature when the rail was laid and last adjusted is required.

Joint Bars

Important items are:

- Type (insulated, compromise armored etc.)
- Length
- Number of holes
- Condition-cracked, broken, missing
- Evidence of rail-ends mis-match within the joint bar
- Evidence of wear on joint bar

Bolts

Determine:

- Number per joint
- Condition-loose, broken, missing
- Size, type

Anchors

Determine the following:

- Type
- Pattern
- Number per 39' panel
- Number and pattern within 200' of nearest joint
- Condition
- Effectiveness, that is, whether against ties and, if not, determine distance away from tie, how many and location along rail
- Evidence of rail creep or buckling

Gage Rods

Look for:

- Number per 39' panel
- Kind - insulated or non-insulated
- Carriers standard
- Why are they needed

Tie Plates

Determine:

- Type-single shouldered, double shouldered, or no plates at all
- Size
- Condition
- Cant, such as 1 in 14, 1 in 30, 1 in 40

Spikes & Fasteners

Factors that must be considered are:

- Type-cut, lock, hair-pin, Pandrol clip, lag-screw, etc
- Number and arrangement along each rail
- Length
- Condition-evidence of deformation
- Penetration-evidence that spikes are not settled at rail base and if high, determine how high, how many, and location.

Ties

Important items to be noted:

- Kind-hardwood, softwood, concrete, steel or composition
- Class and length
- Cross section
- Condition-evidence of splitting, plate cutting, loss of rail cant or slewing, spike kill
- Tie spacing
- Condition-evidence of swinging, pumping or center-bound ties including amount of contamination
- Standard plan of carrier

Ballast

Determine the following:

- Type
- Size
- Depth under tie
- Width beyond tie end
- Distance below top of tie
- Section in cribs
- Standard plan of carrier

Subgrade

Factors of importance

- Soil type
- Stability
 - Evidence of moisture
 - Drainage
 - Ditching
 - Evidence of previous slurry injection
 - Slope stability
- Type of terrain
 - Depth of cut
 - depth of fill
 - Position of sidehill

Turnout

If a turnout is involved, the following items should be noted:

- Turnout number
- Type-hand-thrown, power operated, spring switch, equipped with an electric lock
- Type and length of switch points-standard, undercut, manganese tip
- Type of switch stand
- Open or missing switch locks
- Type of frog-rigid, spring, self-guarded
- Tie condition
- Non standard components
- Evidence that turnout has been run through

TRACK GEOMETRY

In the event track geometry is the probable cause, details on the theoretical alignment, grade and vertical curve characteristics, and field measurements of specific parameters which portray the actual track geometry conditions in the immediate area of the POD are required. These parameters are divided into five parameters: Gage, Alignment, Crosslevel, Surface, and Warp

Gage

- Gage must be determined at each station measured between heads of rail at right angles to the rail in a plane 5/8 inches below the top of the rail head. Gage must be within the limits prescribed in Subpart C-Track Geometry sub-section 213.53 of the Code of Federal Regulations
- If a wide gage is suspected, investigate spike condition and plate action on tie surface for evidence of gage widening under load and returning to normal when in an unloading position. Look for marks on rail head indicating edge of wheel rim or flange riding on or crossing over top of rail.

Alignment

- The existing track alignment is used to determine the amount of deviation from theoretical curved alignment; whether super elevation was sufficient for actual speed of a train if the derailment occurred on a curve and for variation from a straight line in case the derailment occurred on tangent track. Alignment on curves should be checked using string line method by measuring the mid-co-ordinates on the high rail at each station. The degree of curvature can also be established by using a 62-foot chord and measuring the mid-ordinate 5/8 inch below the head of the rail at 15.5 foot intervals. The measurement at the mid-ordinate in inches is equal to the degree of curvature.
- Alignment may not deviate from uniformity more than the amount prescribed in Subpart C Track Geometry sub-section 213.55 of the Code of Federal Regulations.

Track Curvature

- Except as provided in 213.63, the outside rail of a curve may not be lower than the inside rail or have more than 6 inches of elevation
- The maximum allowable operating speed for each curve is determined by the following formula:
 - $EU = .000691 (D) (V) - E$
 - EU = calculated unbalance elevation in inches
 - D = degree of curvature
 - V = actual speed of train at time of the derailment in miles per hour
 - E = actual superelevation in inches

Track Surface

- Crosslevel is the difference in height between the grade rail and the other rail at points directly opposite each other measured with a levelboard or track gage equipped to take these measurements.
- On tangent track both rails should be the same height. This is called zero cross level.
- Measurements should be made with loaded car or locomotive on the track if possible.
- Track surface and crosslevel should be maintained to the standards listed in Subpart C Track Geometry sub-section 213.57, 213.59, 213.63 of Code of Federal Regulations.
- Track twist/warp refers to the difference in superelevation between two points within 62 apart on opposite rails.

This checklist is intended to serve as an aid for performing investigations relative to highway-rail grade crossing warning systems and signal systems.

In most cases the police report can be the basis for your report. There must be a site visit, but it may not need to be done immediately. Depending on the circumstances FRA may decide to wait several days.

You must perform a thorough evaluation of the crossing. If active warning devices are involved find out how the system has performed (reliability). For both **active or passive**, get the following information:

- Type of warning system (technical description) and DOT Number assigned to the crossing.
- Public or private crossing
- Advance warning signs and pavement markings (state what **wasn't** there as well as what **was** there).
- Is crossing equipped with cross bucks signs
- If multiple tracks are involved, is this indicated by signs
- Sight distance and obstruction information, to include the physical surroundings, and the sight distances from the locomotive and highway vehicles.
- Note type of surface, angle and level of roadway approaching and over crossing
- Note legal speed limit for roadway user/maximum authorized track speed and method of operation
- Check for whistle posts and measure distance from crossing.
- Get photos of the immediate area. Show all obstructions in the photos
- Find out what the state, county or municipal responsibilities are. For example, how would a decision be made that the crossing warning system is or isn't adequate?
- Find out what the railroad responsibilities are. This includes not only active warning device information, but also whether or not they are required to maintain the pavement on each side of the crossing.
- See if there are joint municipal/railroad responsibilities. This might include situations where highway signals are connected to railroad signals. (Interconnected)
- If there are adjacent tracks, would rolling equipment obstruct the view of the crossing? If so, under what circumstances does the railroad place cars on the track and how do they deal with the obstruction issue?

If Active, the warning system should be inspected and tested for proper operation. In the presence of a S&TC inspector the following inspections and tests should be performed by railroad personnel:

- Receive a proper On-Track Safety job briefing from the railroad RWP/OTS Employee-in-Charge before fouling any track.
- As soon as possible obtain printouts of any installed event recorders from highway-rail crossing warning systems. Have the railroad provide interpretation of events with an explanation of any time differences between recorded times and real time. Verify recorder inputs correspond to circuit plans.
- Perform shunt tests to all track circuits and verify equipment detects shunt and system will operate
- Inspect lights for proper operation, alignment and visibility
- If equipped with a bell, test for proper operation
- Inspect any traffic light interconnects for proper operation
- Measure approach lengths for proper warning time at maximum authorized speed
- Inspect time-out circuits or switch cut-out circuits
- Test standby power operation for proper operation
- Perform a ground test
- Obtain and inspect test and inspection records for at least one year back
- Obtain estimated damage dollar amount to highway-rail crossing warning system if applicable
- Interview maintenance personnel on maintenance procedures and tasks performed to signal system
- Other inspections and tests as applicable (Dax units, insulation resistant test, etc.)

Additional Information of Tests

Give a description of additional inspections and testing (component testing) performed in conjunction with other tests performed.

AI Job Aid 09

MP&E Accident Investigation Checklist

If a mechanical component is suspected of contributing to the derailment cause, consider obtaining the following information.

- Confirm actual consist in order by vehicle number and leading end
- Examine car and/or locomotive truck components for wheel-rail interaction.
- Determine any appropriate L/V (lateral - vertical) forces
- Determine braking horsepower for runaway trains
- Conduct brake distance tests
- Air Brake Test Certificates
- Blue Card(s) FRA Form F6180-49A
- Daily Inspection Card(s)
- Other Locomotive Maintenance Sheets in Cab
- Last 3 Months of Maintenance History for Each Locomotive
- Functionality test of locomotive cab alertness devices, if equipped
- Check the continuity of the EOT device
- Activation of two-way EOT toggle
- Evidence of exhaust or battery gases entering the cab compartment
- Perform initial terminal air brake test on un-derailed portion of train

This checklist is intended to serve as an aid for fatality investigations for which the cause is not clear (heart failure, etc.). Most fatality investigations are critical to FRA's overall understanding of the culture of a railroad or a railroad facility. Thus, it is critical to conduct as thorough of an investigation as possible.

Because of the limited scope of this job aid, it is impossible to cite all of the duties associated to Human Factor type investigations. However, it does attempt to cover the main items that should be addressed on this type of investigation.

- Evaluate all applicable rules or standards, and ascertain whether or not there are **conflicts** amongst them. Determine if the applicable rules are clear and unambiguous.
- Analyze all applicable Railroad Operational or Safety Tests data; and find out if the railroad or company requires job briefings. If job briefings are required, give the details, including whether or not the requirements are followed.
- Conduct several interviews (six or so) with people assigned to the facility. Ascertain whether rules compliance is required, or if shortcuts are common and encouraged.
- If the location is an industrial facility, do OSHA and/or state rules apply? If so, is OSHA or the PUC going to cite these rules as causal?
- Make **both** a checklist for the particular facility **and** a task listing for the person who was fatally injured. These lists will vary for different types of facilities (railroad yards/property; industrial facility) and person fatally injured. *Note: A task listing details all of the duties a person was performing prior and up to the time the fatal incident occurred.*
- Evaluate any risks involving loss of situational awareness that could have jeopardized the employee's safety during the performance of their assigned tasks.
- If FRA rules are involved, the investigation must be very complete. You **must** conduct a significant number of comprehensive interviews with employees of that facility.

AI Job Aid 11

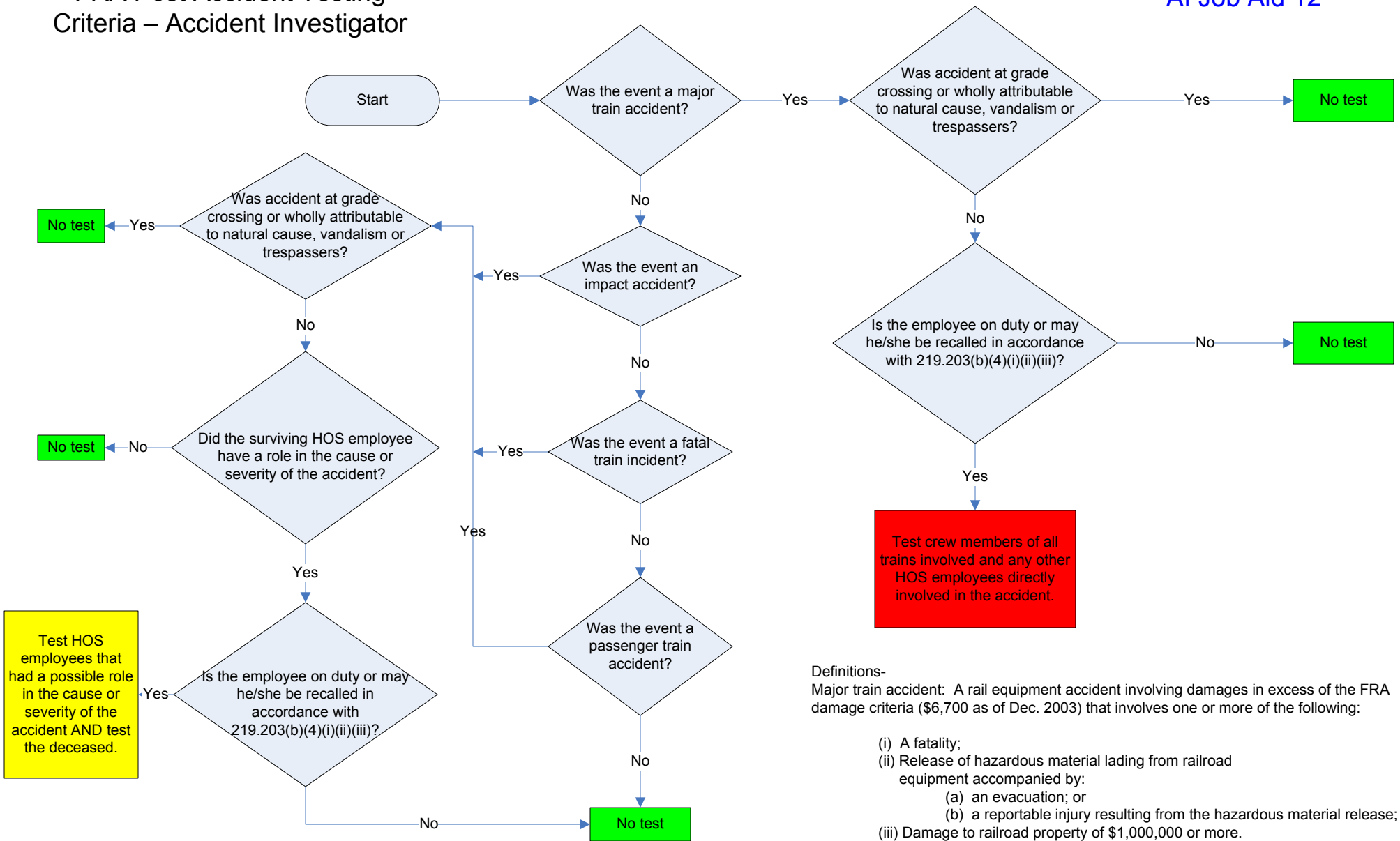
Selected Questions from SOFA Findings and Recommendations of the SOFA Working Group report (Appendix G) dated October 1999.

- 39. What Personal Protective Equipment (PPE) was the FE required to wear?
Type: N/A, hearing protection, eye protection, footwear, hard hat, hard hat liner, or other hood, hand protection, Safety Visibility Vest
- 40. Was the protection in use?
Type: N/A, hearing protection, eye protection, footwear, hard hat, hard hat liner, or other hood, hand protection, Safety Visibility Vest
- 41. Was clothing, footwear, or PPE equipment contributory to the accident/incident. If so, explain
- 44. Engineer yrs. railroad experience
Comment: Provide for each engine crew member identified
- 45. Engineer yrs. craft experience
Comment: Provide for each engine crew member identified
- 47. Conductor yrs. railroad experience
Comment: Provide for each train crew member identified
- 48. Conductor yrs. craft experience
Comment: Provide for each train crew member identified
- 49. Brakeman yrs. railroad experience
Comment: Provide for each train crew member identified
- 50. Brakeman yrs. craft experience
Comment: Provide for each train crew member identified
- 51. Switchman yrs. railroad experience
Comment: Provide for each train crew member identified
- 52. Switchman yrs. craft experience
Comment: Provide for each train crew member identified
- 53. Number of Crew members on Ground
Comment: Provide for each train crew member identified
- 54. Number of ground crew actually involved in the move
- 67. FE Crew's anticipated next move
- Type: Spot, Couple, Uncouple, Stop, Shove, Begin movement, Other
Comment: This field is useful to help understand potential sources of attention distraction.
- 68. External or unusual circumstances
Comment: In this field put information that is relevant but does not fit the other categories. For example, Hand-switch confusion, Jammed knuckle, Illegal handrail.
- 69. Was another crew involved in the incident?
Comment: If answer is yes, then fill in information below about that crew
- 70. Engine Crew Composition
Comment: Indicate the number of each crew type

- 71. Train Crew Composition
Comment: Indicate the number of each crew type
- 72. Number of Crew members on Ground
- 73. Number of ground crew actually involved in the move
- 74. Yardmaster yrs. railroad experience
- 75. Yardmaster yrs. craft experience
- 76. Dispatcher yrs. railroad experience
- 77. Dispatcher yrs. craft experience
- 84. Was employee struck by own crew's equipment or that of another crew
- 85. What was the nature of the movement?
Type: Pull, shove, free-running
- 86. Where on the locomotive/equipment was the FE riding?
Type: Side- Leading end, Side-Trailing end, End, etc..
- 87. Were there other movements in the immediate area on same track
- 88. Were there other movements in the immediate area on adjacent tracks
- 89. Was locomotive/equipment operating in accordance with rules?
Communications Issues
- 90. Type of signaling in use
Type: Hand signals, radio signals, none
- 103. Type of Radio Used
Type: Handset, Chest-pack, Remote microphone, Waist/belt pack, Locomotive mounted
- 104. Was the radio used when hand signals could have been used instead?
- 105. Did the employees know which moves were to be made by radio comm.?
- 106. Did the employees understand that while using the radio, the engineer will not accept any hand signals, unless it is a Stop signal.
- 107. Were specific instructions given for each movement?
- 108. Did the employees respond to those specific instructions?
- 109. Was there a mixture of hand and radio signals used?
- 110. If the movement involved backing or shoving, did the radio communication specify the direction and distance?

- 111. Was the direction & distance acknowledged if that distance was more than four car lengths?
- 114. Did the employee continue to proceed, though acknowledgment was not received?
- 115. Was proper identification a factor in the incident?
- 117. Did employees act on an incomplete or misunderstood radio comm.?
- 119. Was the movement stopped within half the distance specified when additional instructions were not received?
- 121. Did radio malfunction any time b/4 incident and still used in service?
- 122. Were there other radio communications that interfered with transmission?
- 123. Was radio on and tuned to proper channel?

FRA Post Accident Testing Criteria – Accident Investigator



Definitions-

Major train accident: A rail equipment accident involving damages in excess of the FRA damage criteria (\$6,700 as of Dec. 2003) that involves one or more of the following:

- (i) A fatality;
- (ii) Release of hazardous material lading from railroad equipment accompanied by:
 - (a) an evacuation; or
 - (b) a reportable injury resulting from the hazardous material release; or
- (iii) Damage to railroad property of \$1,000,000 or more.

Impact accident: A rail equipment accident involving damages in excess of the FRA damage criteria (\$6,700 as of Dec. 2003) that results in:

- (i) A reportable injury; or
- (ii) Damage to railroad property of \$150,000 or more.

Fatal Train Incident: Any event involving the movement of railroad on-track equipment that results in a fatality to any on-duty railroad employee but in which railroad damage does not exceed the FRA damage criteria (\$6,700 as of Dec. 2003).

Passenger Train Accident: A reportable injury to any person in a train accident where the FRA damage criteria (\$6,700 as of Dec. 2003) is met involving a passenger train.

Note: The remains of a fatally injured HOS or non-HOS employee must be tested. However, surviving non-HOS employees are not to be tested.

Cover Memo List of Attachments Checklist

This checklist is designed to aid the investigator in gathering and organizing documents that help support the factual findings of your investigation, and are essential parts of your final report. Check the box when the form has been obtained or indicate N/A if not relevant to accident.

- FRA Form(s) F6180.54 if there is *reportable* damage to railroad equipment. Whether or not there was reportable damage, the carrier must maintain a Form 6180.97 or alternative railroad designed record on file. You can ask to see this form for comparison with other information you have obtained.

If the carrier is required to complete a .54 form, the information on it should agree with your .39 report. If it does not, call the railroad and discuss the correct information. If the railroad refuses to change their .54 report and you have evidence indicating the information on the .39 is correct, you **MUST** submit a memorandum with your .39 report explaining the variances and what you did to resolve them.

- FRA Form(s) F6180.55a if any *reportable* injuries occurred. If there were any injuries, *reportable or not*, the carrier must maintain a FRA Form F6180.98 or alternative railroad designed record if anyone was hurt. You can ask to see this report for comparison with other information you have obtained. (If natural caused fatality, a .55a report may not be available.)
- FRA Form(s) F6180.81 if human factor is given as a cause
- FRA Form(s) F6180.78 notice to responsible employee in any human factor caused accident
- FRA Form F6180.57 if grade crossing accident
- If track caused accident, include “Factual Information Report on Rail Failures” and/or “Railroad Buckling Accident/Incident Study”.
- Company reports of accident
- Company personal injury reports
- Reports of interview with employees involved

- Interview statements if grade crossing accident, Amtrak accident or otherwise beneficial for understanding the accident circumstances
 - How did the equipment hold up?
 - Was the headlight illuminated?
 - Was the bell ringing or the whistle sounded?
 - Were active warning devices operating at the crossing?
 - Explain how the highway vehicle approached the crossing?
 - Where were the crew members on the train?
 - What kind of injuries did they see or receive?
 - Did they see luggage or other articles flying around the coach which may have caused injuries?
 - Are there emergency egress issues or observations?
 - Were the window seals and door releases working properly?
 - How did crew members and emergency responders deal with the procedures?

- Damage reports or estimates of monetary damage to track, signal and equipment

- Authorizations for movement (track warrant, DTC, etc.)

- Dispatcher's record of train movement

- Transcripts of pertinent radio conversations

- Book of Operating Rules (**only** cover page, page showing that this railroad subscribes to GCOR or other rulebook **and** pages containing applicable rules)

- Current timetable (**only** cover page **and** pages showing method of operation, subdivision on which the accident occurred, authorized speed at the point of accident and applicable rules)

- Special Instructions (**only** cover page **and** pages containing applicable rules)

- General Orders that are applicable (if any)

- Track Profile

- Consists of trains involved

- Hazardous material records

- Include these items **only** if they clarify why the accident occurred and indicate in the report (or a cover memo if you send one) what they mean to the report:
 - Hours of Service records
 - Train delay report (if not on the Hours of Service records)
 - Work history for responsible crews
 - Discipline history for responsible crews
 - Training and efficiency test records for responsible crews
 - Pertinent parts of railroad investigation (only if they shed light on the accident)

- Circadian Rhythm Report, if human factors were a cause.

- Death certificate or Coroner's report (if railroad employee fatality)

- Police reports
- Drug and alcohol testing results only (Keep in mind privacy concerns.)
- Locomotive event recorder information (expanded with a narrative)
N.B. Check 229 for events recorded.
- Signal or Track inspection records (if signal or track cause probable)
- Results of carrier inspections of locomotive speed indicator, automatic brake valve, etc.
- Newspaper reports
- Pictures
- Diagram (item 108 of 6180.39 form) showing direction of North, position of cars, number and configuration of tracks, all applicable signals, obstructions to vision, mileposts and nearest station on each side of accident site. (See item 108 of the Form 39 instructions.)
- Copy of “Whistle Ban” ordinance, if there is one
- Inspection Reports (FRA Form 6180.96) associated with the investigation.

N.B. Submit “Over-the-Counter and Prescription” Report to the FRA RRS Alcohol & Drug Control Program Manager if human factor caused accident. Not to be included in the accident report.

Notes Tab Goes Here

