

# Track and Structures Compliance Manual

## Volume I General

### Chapter 3 Automated Track Inspection Program (ATIP)

2026

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U.S. Department of Transportation

**Federal Railroad Administration**

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## **2026 Release Note (Volume I, Chapter 3)**

This document was prepared by the Federal Railroad Administration (FRA) Office of Railroad Safety, Track and Structures Division.

This chapter contains no regulatory language. It is provided as field guidance for FRA inspectors and is not to be construed as regulatory language in any manner.

This chapter has been updated since the January 2023 release. Changes include:

- Formatting.
- Minor spelling, grammatical, and typographical corrections.
- Extraneous background discussion removed.

## Chapter 3 Automated Track Inspection Program (ATIP)

### Background

This chapter provides functional understanding of the Automated Track Inspection Program (ATIP) in terms of operation, policy, on-track safety requirements, measurement technology, and national deployment of ATIP's automated inspection vehicles. Under the statutes mandated by Congress, ATIP vehicles conduct surveys of the U.S. rail transportation network for determining railroad compliance with certain components of the Federal Track Safety Standards (TSS). Since 1974, the operation of ATIP has served an important role in FRA's compliance programs. The program is managed by the Engineering, Automation & Technology Division within FRA's Office of Railroad Safety, while operations and logistical support is provided via contract operators.

### Modes of Operation

Staffed – This mode has contract personnel onboard analyzing data in real time.

1. Fully Staffed – An FRA Track Inspector is on board the vehicle.
2. Partially Staffed – An FRA Inspector is not on board for the entirety of the survey.

Autonomous – This mode does not have personnel onboard analyzing data in real time.

1. Passenger – The vehicle operates within revenue a passenger train and is generally only utilized on long-haul Amtrak service.
2. Freight – This mode is utilized by cars operating within revenue freight service.

### ATIP Vehicle Operation

All FRA Inspectors assigned to ATIP vehicles should ensure compliance with applicable railroad operating rules, special instructions, and specific FRA policy and procedures by everyone on board when ATIP survey vehicles are operated.

ATIP has a fleet of FRA-owned and contractor-owned automated track inspection vehicles that, as of 2025, consists of 10 total vehicles including 7 geometry rail-bound cars, 1 rail-bound support car, and 2 hi-rail trucks. The FRA-owned rail-bound cars are identified by Universal Machine Language Equipment Register (UMLER)0F0F0F<sup>1</sup> (listed as private equipment) and publicly recognized with the DOTX prefix on the car body above the truck (e.g., DOTX 216, 218)

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<sup>1</sup> UMLER is a registered rail equipment reference (e.g., DOTX 216 is the same as T16)

## Self-Propelled Survey Vehicles

The DOTX 218 and DOTX 219 have the ability operate in a self-propelled mode under their own power. FRA policy defines these self-propelled ATIP cars as specialized maintenance equipment (SME). As they may not reliably shunt track signal circuits, certain operating restrictions apply. By policy, these ATIP cars are not considered locomotives<sup>2</sup> (even though they have cab controls and couplers). Operating as an SME relieves ATIP contractors from maintaining locomotive engineer certification and complying with hours-of-service regulations and other requirements. As an SME, self-propelled ATIP cars are not subject to Title 49 Code of Federal Regulations (CFR) Part 229 but will act in accordance with the safety appliance section and other pertinent sections of the regulations. Under no circumstances are ATIP vehicles to operate in self-propelled mode while coupled with another car. While the DOTX 218 and 219 are able to operate in self-propelled mode, FRA has chosen to conduct operations of these cars exclusively in towed operations.

All ATIP vehicles operate in accordance with railroad operating rules. ATIP self-propelled geometry car movement has one additional requirement; following absolute block protection must be maintained and supersedes railroad operating rules or equivalent protection given to a train<sup>3</sup> or on-track equipment.

ATIP hi-rail vehicles (e.g., DOTX 304 and DOTX 305) are operated by contractors to the FRA. As they operate on many railroads throughout the country, it is not feasible for the operators of those vehicles to be qualified on the rules of all railroads. Therefore, a qualified railroad roadway worker in charge must provide on-track safety for the vehicle(s).

## Reverse Movements

To accomplish on-the-ground track exception verifications or for other purposes, ATIP movement in the reverse direction may be necessary. As with all movements, those in the reverse direction shall be conducted in accordance with the applicable railroad operating rules. Reverse movements may also be limited by:

- 1) Operations through certain interlockings,
- 2) Operations over multiple highway-rail grade crossings, and
- 3) Operations of a significant distance.

## On-Track and Onboard Safety

ATIP vehicles are required to operate safely in accordance with railroad rules, federal regulations, FRA policy, and the contractor's policies and procedures. Safe ATIP surveys are the responsibility of everyone onboard. Assigned FRA personnel are responsible for the authority,

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<sup>2</sup> 49 CFR Part 229, Subpart A – General, § 229.50(k), Definitions

<sup>3</sup> 49 CFR § 236.832 – Definitions, Train

enforcement, and control of this policy. Inspectors should report thorough details of any unsafe situation to their supervisor and to the FRA ATIP Program Manager.

The Survey Director, in coordination with the FRA Track Inspector, will provide a job briefing on general survey vehicle safety, onboard safety apparatus, and on-track protective procedures whenever anyone comes on board a vehicle and when anyone debarks to foul a track. The safety briefing will discuss, at a minimum, the following:

1. General communication methods and procedures during emergencies.
2. Location of survey vehicle safety apparatus (e.g., fire extinguishers, first-aid kits, breathing apparatus, and identification of individuals on board who are trained in CPR).
3. Procedures for egress through specific doorways and windows.
4. Applicable physical and operating hazards and procedures when fouling the track.

The FRA Track Inspector is responsible for ensuring that everyone on board the ATIP car is briefed and updated as safety conditions or events change throughout the day. This task will be performed by the Survey Director if an FRA Track Inspector is not onboard. All train movements are coordinated with the Survey Director. Before exiting the vehicle and fouling any track, on-track safety should be established.

Whenever the vehicle stops to evaluate a track condition, conduct instrumentation checks, or carry out repairs, the FRA Track Inspector (or Survey Director if no FRA Inspectors are onboard) will ensure the following:

1. An on-track safety briefing is conducted.
2. A railroad representative provides appropriate on-track safety prior to fouling a track.

If a railroad employee is unavailable or unable to assume the roadway in charge role to provide on-track safety, the FRA Track inspector may afford on-track safety in accordance with FRA policy as follows:

1. Two FRA or State inspectors may work together with one acting as a watchman/lookout for the other if they know the pertinent operating characteristics of the railroad at that inspection point.
2. An FRA or State inspector working alone may use individual train detection outside of control points if they know the pertinent operating characteristics of the railroad at that inspection point.

On-track safety may be provided via train coordination with a rail-bound geometry consist. This option for on-track safety is only applicable where the train has exclusive authority to move, which may require the train crew to obtain exclusive authority from a dispatcher.

FRA may invite guests on ATIP vehicles. However, guests are not authorized to occupy the track without the permission and established on-track safety. The term “guests” does not include ATIP contractor personnel who are agents of the Government.

See Track and Structures Compliance Manual Volume III, Chapter 1 for further information about Railroad Workplace Safety and Volume III, Chapter 3 for further information about Roadway Worker Protection.

## **Survey Scheduling**

Planning efficient ATIP surveys is an iterative, multi-step process that occurs throughout the year. ATIP operates in a dynamic environment and adapts to changes in traffic patterns, accident trends, agency priorities, severe weather, risk model outputs, etc. This necessitates ATIP scheduling to be amenable to routing and schedule changes throughout a year. Thus, rather than scheduling taking place once per year, it is an iterative process that projects out several months while remaining adaptive to necessary changes.

### **Route Prioritization**

Scheduling successful ATIP inspections is attained by designing and managing a program that is efficient, and neither exhausts district resources nor overburdens a particular railroad, yet adequately covers prioritized track segments.

ATIP schedules are created while considering the following survey priorities:

- Risk-Based ATIP Prioritization Tool
- HAZMAT routes
- Passenger routes
- STRACNET routes
- FRA input from the various offices
- Carryover priority routing not covered in the prior year(s)

ATIP survey routing is prioritized utilizing multiple inputs. A major input utilized by ATIP is a risk-based route prioritization tool that was developed specifically for the program. The tool utilizes various data to calculate risk and aggregate consequences for each segment of the U.S. rail network using recent ATIP data, rail traffic information, and historical accident, injury, and fatality data. The algorithm assigns an inspection prioritization level to each segment of the U.S. railroad network based upon these risk factors.

While several of the categories listed above to prioritize are also incorporated within the risk-based prioritization tool, their impact on the prioritization rating may not always be sufficient to provide clear distinctions for all track segments that could be included while conducting surveys between the highest priority areas. Thus, those are considered again to inform planning across

routes that otherwise may have a similar rating from the prioritization tool. Requests from FRA offices are handled manually and may have other specific requirements, such as a specific measurement platform or timeframe for the survey. With ATIP's available resources, it may not be possible to survey all prioritized routes each year. Requests and prioritized areas that are not included in the current schedules are saved for future inclusion in subsequent planning.

### **Scheduling Staffed Vehicles**

The ATIP contractor is responsible for the preparation and management of an ATIP vehicle's schedule outline that is projected out several months and is overseen by FRA. The schedule identifies normal railroad crew change points and mileage estimates that the inspection vehicle can achieve in an 8- to 12-hour day. The proposed outline is offered to the FRA District personnel to review and provide comments on the schedule outline and route feasibility. District personnel knowledge of their assigned territory is crucial in developing efficient and effective schedules. Changes to the routing or tie up locations is most easily modified during this phase in planning.

After incorporating District input on the schedule outline, an official notification letter and operations plan are distributed to the respective railroads and applicable FRA personnel approximately three (3) months in advance of the scheduled inspection, or as soon as practicable. The content of the letter details FRA's authority, operations plan, vehicle clearance diagram, and other pertinent information. Notification is provided monthly to each track owner for each vehicle that will survey their track. As necessary, modification notices to these plans with updated schedules are distributed.

Occasionally, the ATIP schedules may require altering to correspond with minor changes affecting daily start and stop times or locations. Prompt distribution and coordination of necessary schedule modifications to the respective railroads and FRA districts is essential. There should be no substantive changes to the final schedule 2 weeks prior to the survey unless an unforeseen circumstance occurs. Last-minute changes have an undesirable effect, are difficult to make, and affect the overall schedule on other districts and railroads.

### **Scheduling Autonomous Vehicles in Passenger Service**

The scheduling of autonomous surveys conducted by vehicles in revenue passenger train service is handled in a similar fashion to that of staff vehicle surveys. Planned routing of such surveys are included in the schedule outline, allowing for District input.

An official notification letter and operations plan are provided to owners of all tracks over which the ATIP vehicle is expected to survey. The contractor coordinates with the passenger service operator(s) for all items required for movement of the ATIP vehicle in the passenger train.

### **Scheduling Autonomous Vehicles in Freight Service**

Autonomous ATIP vehicles operating in freight service are moved within general revenue service via waybill. Due to ATIP not having control over the exact routing of these autonomous vehicles, they are not included in the schedule outline.

An official notification letter and operations plan are provided to owners of all tracks over which the ATIP vehicle is expected to survey. The content of the notification letter details FRA's authority, vehicle clearance, and other pertinent information. Notifications are provided to each track owner at least once per calendar year for each vehicle that is anticipated to survey their tracks.

### **Clearance Restrictions**

Prior to commencing a survey, FRA inspectors will coordinate with the Survey Director regarding current track numbers, current authorized operating train speeds, and pertinent information from track charts for the survey.

ATIP's rail-bound cars comply with Association of American Railroads interchange rules; however, track curvature greater than 13 degrees may present clearance issues. Operation of rail-bound cars on curves greater than 20 degrees is prohibited.

Track Inspectors should communicate with the railroads regarding ATIP surveys to ensure the intended routing is acceptable for the clearance envelope and any other restrictions of the survey vehicle.

### **Survey Vehicle Security**

Track inspectors are responsible for proper security of ATIP vehicles. FRA inspectors should review survey schedules in advance of surveys and coordinate appropriate tie-up locations that will minimize the risk of vandalism and afford survey personnel access for maintenance purposes. To prevent undesired access when a survey vehicle is unoccupied on track, FRA inspectors will ensure contractor personnel provide protective measures and shall oversee the application and placement of protective devices and train control signs (e.g., red or blue flags), as circumstances warrant. FRA inspectors will notify both district and HQ staff if conditions exist that do not allow protective devices to be applied or if the only available tie-up location presents significant risk of vandalism to the vehicle.

### **District Involvement in Survey Operations**

For each survey day, the district will assign a Track Inspector to oversee the operation. Track Inspectors assigned to an ATIP operation will facilitate efficient survey operations by coordinating with the railroad(s) logistical details such as:

- Tie up locations,
- Locomotive(s) or buffer car requirements,
- Train crew or pilot on-duty times,
- Crew change points,
- Fuel, water, and power for the survey vehicle,

- Security, (as needed), and
- Authorizing report distribution to the appropriate railroad personnel.

Track Inspectors also serve a valuable role in ensuring railroad personnel onboard understand the information displayed.

### **iTrack**

iTrack is a process that allows for partially staffed ATIP operations without FRA personnel onboard during a survey. The survey data are reviewed in real time as with fully staffed operations and key details are transmitted throughout the survey to the FRA Track Inspector assigned to the survey.

Mid-survey exception e-mails are provided to the inspector that contain pertinent details about noted exceptions and contain hyperlinks to the location in Google Maps. When exceptions have been noted, these reports are transmitted as cell signal permits at least every 5 miles, or more frequent as warranted. Advisory and Class +1 exceptions may not be distributed via these procedures but will be contained within the report produced at the end of the survey.

To initiate iTrack, the district should provide advance notice of its decision to utilize iTrack to ATIP and local railroad management. Railroad personnel are encouraged to accompany the ATIP survey even without FRA presence onboard. When there are no FRA personnel onboard during the survey, the vehicle will not stop to verify any geometry measurements; however, the vehicle may be stopped for instrument verification purposes.

## **Standard Assessment Procedures**

### **Daily Deployment**

Typically, staffed surveys are conducted during daylight; however, operations may require surveying before sunrise and after sundown. Inspectors should address any notable safety concerns in the safety briefing.

Survey on-duty time begins when the brake test is conducted. Active survey on-duty time should not normally extend beyond 12 hours; however, it is understood that certain operating delays might occur from a variety of causes that hinder this. Track Inspectors should facilitate determining the reason for operational delays, which are documented by the contractor. Inspectors are to notify district and ATIP management if any unusual occurrence significantly affects the daily schedules or if cumulative delays are expected to result in surveys exceeding 12 hours.

Continuation of surveys beyond 12 hours require documentation by the contractor with concurrence from the Track Inspector and personnel onboard. It is imperative that personnel onboard ATIP survey vehicles know their individual limit for physical fatigue beyond 12 hours of on-duty time. Any time an unsafe circumstance exists that does not conform to railroad or ATIP procedures and instructions, the situation shall be immediately addressed, resolved, and reported to district and ATIP management.

Deviations from the intended route or destination during a survey should be coordinated with district and ATIP management.

### **Valid and Invalid Surveys**

ATIP vehicles inspect and produce reports of applicable main tracks, sidings, and other than main track traversed when conducting scheduled surveys. Unplanned inspection of other than main track, including excepted track, is discretionary; however, care should be taken to prevent damage to the survey vehicle and its measurement equipment.

ATIP geometry vehicles are designed to record geometry data when moving above system cutoff speeds, except where conditions exist that may cause equipment damage, or as designated by FRA HQ. Anywhere the ATIP vehicle operates, the TGMS instrumentation on board will record applicable track geometry measurements.

ATIP rail inspection vehicles conducting ultrasonic non-destructive evaluation may not record data over all tracks traversed.

Producing a survey report is mandatory for a valid survey and will not be produced for invalid surveys or segments.

An authorized or valid survey operation occurs on condition that the following prerequisites are in place:

1. The railroad is officially notified by FRA in writing.

Authorized track speed is greater than 5 mph.

2. The measurement system(s) are online and functioning as intended.

A survey operation (or segment) may be declared invalid if any of the following circumstances occur:

1. Measurement system failure resulting in instrument inaccuracy.
2. Measurement system impairment due to snow, vegetation, high ballast levels or excessive debris, mud, grease/oil causal factors, etc.
3. The survey vehicle is “deadheading” in a train.
4. Performing system validation, reproducibility testing, or undergoing scheduled or unscheduled maintenance.

When reports are produced from a valid survey, they will be provided to the track owner. For those locations where the survey of certain track segments was deemed to be invalid, the survey data and reports will not be provided.

## **Test Speed and Track Classification**

ATIP vehicles always comply with the operational speed requirements in the railroad's operating rules. However, in terms of evaluating track conditions, FRA policy does not necessarily recognize all speed restrictions. Railroads place speed restrictions for a variety of reasons, which are generally substituted for the maximum authorized train speed used by ATIP for determining compliance with the TSS. Railroads also may elect to reduce train speed for efficiency reasons in advance of ATIP surveys by placing a temporary "blanket" slow order over long segments of track. In the latter scenario, the survey vehicle will operate in accordance with the temporary speed restriction, but survey data will be assessed against the maximum authorized train speed without regards to the blanket speed restriction.

## **Track Designation**

ATIP uses a simplified numbering convention to designate tracks within the data and reports. Tracks designated as number one (1) through four (4) are main tracks one through four, five (5) designates single main track, six (6) designates a siding, and seven (7) denotes all 'other than main' track.

## **Exception Location**

ATIP exception locations are reported with GPS coordinates as well as a milepost and foot count. The interpretation of the milepost and foot count is handled in one of two manners, depending upon whether the survey was conducted via staffed or autonomous operations. For autonomous operations, the foot count is always added to the milepost. These foot count locations are derived by calculating the exception's location between two known milepost locations using previously collected mileposts or railroad provided milepost GPS data.

Locations reported on Staffed ATIP vehicles reflect the number of feet from the last entered milepost. If the mileposts are increasing (e.g., 57, 58, 59), the footage from a milepost is added. That is, an exception reported at milepost 58, foot 1,584 would be interpreted as 1,584 feet from milepost 58 or roughly as milepost 58.3 (assuming a standard 5,280-foot-long mile). The same exception, noted by a staffed vehicle operating in a descending milepost direction, would be reported at milepost 59, foot 3,696 or roughly milepost 58.3 (assuming a standard 5,280-foot-long mile). In the event that a milepost sign is not visible, or its entry is otherwise not recorded during a survey, the foot count will continue to count up from the previous milepost.

A conversion chart between foot count and decimal milepost is located in the Appendix and is available on all staffed ATIP vehicles.

Most exception locations are identified in the report by the location where the peak measurement value can be found. However, some exception types (Warp62, Twist31, Rockoff Hazard, etc.) are reported by the last location (end) of the exception, referenced by the direction that the survey vehicle traveled during the test.

## Track Geometry Assessments

### Exception Detection and Validation

The exception detection and validation processes flag and affirm proper functioning of the equipment. The TGMS compare the geometry data to the exception thresholds for the parameter and the class and speed of the track. When an exception is detected, the system records the nature of the exception, the location (start of exception, end of exception, and peak location), and the peak value of the exception. The validation process utilized by the contract operator of the inspection vehicle ensures there are no apparent anomalies that commonly affect accurate measurement are responsible for the measurement exceeding allowable thresholds.

### Edited Flagged Potential Exceptions

Flagged potential exception may be edited from the issued report by analysts reviewing the survey data. However, flagged potential exceptions are only removed from the reported data and are not removed from the archived survey data. Thus, flagged potential exceptions are available for subsequent review, analysis, and reprocessing.

### Instrument and Exception Verification

To ensure the TGMS is calibrated properly onboard staffed geometry vehicles, instrument verifications (IV) are made a minimum of three times per day on days with more than 100 scheduled miles and two times on days scheduled less than 100 miles. Additionally, incoming data are continuously monitored by survey personnel to ensure that the TGMS is operating as intended.

During a staffed survey, at the instruction of the Track Inspector onboard, the vehicle may be stopped to substantiate exceptions by direct track measurements. If a railroad representative questions the accuracy of the TGMS or a reported exception, the FRA inspector will determine if it is appropriate to stop the survey to verify the exception and/or conduct an additional instrument verification. Track gage exceptions more than 58½ inches should be field verified. All other field verifications will be at the discretion of the FRA inspector. If track structure, geometry, and operating circumstances warrant, inspectors may assess and consider issuing a violation in accordance with Volume I, Chapter 4 of this manual. ATIP's contractors may stop the survey vehicle to conduct quality assurance field verifications; however, exceptions will only be field verified when an FRA Track Inspector is present.

ATIP geometry cars satisfy the 49 CFR § 213.13 requirement to measure track under load. Rail-bound geometry cars normally apply substantial lateral and vertical dynamic load. Speed and dynamic vehicular factors influence the level of applied force and rail movement under load. When conducting unloaded field verifications, movement under load should be considered in accordance with Volume II, Chapters 1 and 2 of this manual.

### Measurement Equipment Malfunction

Inspectors will convey information regarding the vehicle operations and system output to railroad maintenance-of-way representatives, ensuring a complete understanding of the data

presented. In collaboration with the Survey Director, FRA inspectors are to monitor the system output, verifying that all channels are within scale and reading properly.

Certain conditions are known to produce small variations in measured track geometry during automated surveys and do not necessarily indicate a malfunction of the measurement equipment. These conditions include variation in applied track load due to vehicle characteristics, speed, track-induced acceleration, rail temperature, weather conditions, and equipment calibration tolerances.

Under the rail profile system, certain rail conditions may impact the ability to accurately measure track geometry with an automated system. Specific rail sections (e.g., head-free rail) and special track work may affect where the  $\frac{5}{8}$  inch point on the gage side of the rail is measured automatically. Additionally, extreme rail wear (greater than 40 percent of the rail head area) or heavy plastic flow on the gage side of the rail head present challenges for proper measurement.

Indications of a single- or multi-point failure that exhibits questionable values or information of any exception, is justification to stop the survey at that location. The survey will not continue until the conditions are resolved or the system is determined to be operating correctly. If repairs cannot be made to the geometry measurement system, the survey will not continue. The FRA Inspector will contact district and HQ supervision on how to proceed and the track segment affected will be declared as an invalid survey.

## **Rail Integrity Assessments**

### **Ultrasonic Rail Inspection System**

The DOTX 305 is equipped with an ultrasonic rail flaw detection system (URFS) for the inspection of rail for internal flaws. This system utilizes roller search units (RSU) that house numerous transducers in an array that provides an internal inspection of the rail head and web. The system is designed specifically to inspect for rail defects as defined by § 213.113.

The piezo-electric transducers input ultrasound into the rail and detect the returned ultrasound. The system translates these received signals into analogue A-Scans that are further translated into B-Scans. These scans are reviewed by computer algorithms for automatic detection of equipment responses requiring review by a qualified URFS operator.

The URFS scans only provide an indication of a possible rail defect. The existence, nature, and size of the potential defect is determined upon verification with a handheld oscilloscope by a qualified operator.

### **Stop and Verify Testing**

Under stop and verify testing, equipment responses are analyzed and interpreted by a qualified operator in real-time. All indications of potential rail defects shall be verified by hand in accordance with § 213.113(b). Once an indication has been verified, the track owner is required to comply with the requirements of § 213.113.

## Continuous Testing

Under continuous testing, the survey is broken into three phases: data collection, analysis, and verification.

During the data collection phase, the survey vehicle is operated on the track and collects data. The operator is onboard monitoring the system for proper functioning and is not analyzing all the incoming data. However, immediate verification will be conducted if an indication of a broken rail is observed.

During the analysis phase, the qualified operator analyzes the equipment responses to identify suspect locations for hand verification. The suspect locations are segmented into three priority levels based upon the nature of the indication. Those suspect locations containing a suspected defect that, if verified, would require remedial action A, A2, or B identified in the table contained in § 213.113(c), will be labeled as a Priority 1. The segmenting of suspect locations into three priority levels allows for more informed planning for the verification phase. Immediate notification will be provided to the track owner if an indication of a broken rail is observed.

During the verification phase, the suspect locations identified in the analysis phase are verified utilizing a hand oscilloscope. A suspect location shall not be considered non-compliant with the TSS or require remedial action until it has been hand verified. Once a suspect location has been verified, the track owner is required to comply with the requirements of § 213.113.

Section 213.240(e)(6) stipulates that during continuous rail testing that is not conducted to satisfy the requirements for an internal rail inspection under § 213.237 or § 213.339, and properly designated and recorded as such, suspect locations are not required to be verified. Rail testing conducted by ATIP do not satisfy the requirements for an internal rail inspection under § 213.237 or § 213.339, and as such, railroads are not required to hand verify suspect locations identified by ATIP.

The planning for which suspect locations to verify and in what order will include input from the accompanying FRA Track Inspector and railroad representative. While not all suspects locations need to be verified, it is expected that all Priority 1 suspect locations will be verified. Inspectors are expected to notified District and ATIP management if there are obstacles preventing verification of any Priority 1 suspect location. Inspectors that desire to have all suspect locations verified may instruct the survey personnel to do so.

## Exception Remediation

Exceptions discovered by ATIP abide by FRA's constructive knowledge standard in accordance with 49 CFR § 213.5(a) Responsibility for compliance. It is the track owner's responsibility to determine the appropriate remedial action when notice is given that track does not comply with the TSS. For staffed survey operations, proper remedial action must be taken by a railroad representative at the time of notification of an exception. In order to recommend a civil penalty for a condition noted by an ATIP vehicle or improper remedial action taken by the railroad for a condition, an FRA Inspector must field verify the condition.

Advisory exceptions (e.g., PLG24 Safety\*) are noted with an asterisk (\*) and do not require immediate remedial action be taken. Some advisory exceptions (e.g., Runoff\*, Twist 31ft\*) may require further follow-up to determine compliance with the TSS and do not require remedial action be taken until non-compliance has been verified.

For autonomous surveys, FRA recognizes that variables may exist that reduce the reliability of certain aspects of the produced data, such as localization or track identification errors. Thus, for autonomous surveys, FRA does not require that remedial action be applied immediately. However, the data produced should be deemed reliable and FRA expects railroads to prioritize verifying exceptions and apply proper remedial action once verified.

When an ultrasonic inspection for internal rail flaws is conducted, no action will be required by the track owner until an indication of a potential rail defect is hand verified. Once an indication is hand verified, the track owner will be required to apply the appropriate remedial action for the type and size of rail defect per §§ 213.113 or 213.337.

After an ATIP survey, follow-up inspections can determine if appropriate remedial actions have been taken and are at the discretion of the FRA inspector. Prior knowledge is met when the railroad is given notification of an exception and enforcement action should be considered when remedial action has not been taken as described above.

### **Class +1 Exceptions**

The Class +1 assessment provides details on conditions that would be non-compliant when evaluated at one class higher than the posted track class. When a survey is assessed for Class +1 exceptions, they will be included in a separate section or clearly labeled as such on the issued report. While Class +1 exceptions indicate where track might become non-compliant in the future, no immediate remedial action is required.

## **Reports**

### **Survey Reports**

Several types of reports are produced and distributed in association with ATIP surveys and will vary in their format and content depending upon the technology and methods utilized.

### **Document and Data Control**

To ensure hard copy reports produced during staffed operations are delivered only to those persons FRA authorizes, the Survey Director delivers hard copy reports to FRA Track Inspectors onboard who will then distribute to the appropriate railroad representative(s) onboard. In the absence of an FRA Inspector onboard, the Survey Director may hand out reports to the railroad representative on board.

Electronic distribution of reports to the appropriate railroad representative(s) is conducted as authorized by ATIP management and the FRA Track Inspector accompanying a survey.

The Survey Director enters in the survey logs the name and contact information of the railroad representatives that received survey reports directly from the Survey Director. Survey logs are kept on file with the daily survey documentation.

**Appendix: Conversion of Feet to Decimals of a Mile**

Increasing Foot Count	Increasing Decimal Mile	Increasing Fractional Mile	Poles	Decreasing Foot Count	Decreasing Decimal Mile	Decreasing Fractional Mile
0	0	0	0	0	0	1
132	0.025		1	-132	0.975	
264	0.05		2	-264	0.95	
396	0.075		3	-396	0.925	
528	0.1		4	-528	0.9	
660	0.125	$\frac{1}{8}$	5	-660	0.875	$\frac{7}{8}$
792	0.15		6	-792	0.85	
924	0.175		7	-924	0.825	
1056	0.2		8	-1056	0.8	
1188	0.225		9	-1188	0.775	
1320	0.25	$\frac{1}{4}$	10	-1320	0.75	$\frac{3}{4}$
1452	0.275		11	-1452	0.725	
1584	0.3		12	-1584	0.7	
1716	0.325		13	-1716	0.675	
1848	0.35		14	-1848	0.65	
1980	0.375	$\frac{3}{8}$	15	-1980	0.625	$\frac{5}{8}$
2112	0.4		16	-2112	0.6	
2244	0.425		17	-2244	0.575	
2376	0.45		18	-2376	0.55	
2508	0.475		19	-2508	0.525	
2640	0.5	$\frac{1}{2}$	20	-2640	0.5	$\frac{1}{2}$
2772	0.525		21	-2772	0.475	
2904	0.55		22	-2904	0.45	
3036	0.575		23	-3036	0.425	
3168	0.6		24	-3168	0.4	
3300	0.625	$\frac{5}{8}$	25	-3300	0.375	$\frac{3}{8}$
3432	0.65		26	-3432	0.35	
3564	0.675		27	-3564	0.325	
3696	0.7		28	-3696	0.3	
3828	0.725		29	-3828	0.275	
3960	0.75	$\frac{3}{4}$	30	-3960	0.25	$\frac{1}{4}$
4092	0.775		31	-4092	0.225	
4224	0.8		32	-4224	0.2	
4356	0.825		33	-4356	0.175	
4488	0.85		34	-4488	0.15	
4620	0.875	$\frac{7}{8}$	35	-4620	0.125	$\frac{1}{8}$
4752	0.9		36	-4752	0.1	
4884	0.925		37	-4884	0.075	
5016	0.95		38	-5016	0.05	
5148	0.975		39	-5148	0.025	
5280	1	1	40	-5280	0	0