

**American Railway Engineering and Maintenance of Way Association
Letter Ballot 38 21-08**

1. Committee and Subcommittee:

AREMA C&S Committee 38

2. Letter Ballot Number: 38 21-08

3. Assignment:

MP's revised at Fall 2021 meeting.

4. Ballot Item:

Ballot 38 21-08: This ballot contains the MP approved at the Fall 2021 meeting:

5.3.10 - Recommended Instructions for Inspection and Test of Wayside Inspection Systems

5. Rationale:

Revised Manual Parts

Draft Not Yet Approved

Recommended Instructions for Inspection and Test of
Wayside Inspection Systems
~~Revised 2018~~ Revised affirmed 20232 (65 Pages)

A. Purpose

This Manual Part recommends maintenance instructions that apply to the inspection and testing of Wayside Inspection Systems (WIS). This applies to in-service testing and periodic maintenance, and operational inspections. A WIS can include different detection systems that are manufactured by various suppliers. Specific, unique tests of the various data processing systems used, should be as prescribed by the individual system manufacturer, railroad instructions, and applicable AREMA recommendations.

B. General

System Overview

1. A WIS is designed to monitor various equipment components of a train as it passes an inspection point and then report any exceptions to normal operational levels. In addition, the WIS may also monitor conditions of the environment and track.
2. The WIS may utilize many different inspection components to provide warning for suspect conditions. This would include, but not be limited to, the following:
 - a. Infrared Hot Bearing Detector (HBD)
 - b. Acoustic Bearing Detector (ABD)
 - c. ~~Infrared Hot Wheel Detector (HWD)~~ Infrared Wheel Temperature Detector (WTD)
 - i. Infrared Cold Wheel Detector (CWD)
 - ii. Infrared Hot Wheel Detector (HWD)
 - d. Dragging Equipment Detector (DED)
 - e. High Load Detector (HLD)
 - f. Wide Load Detector (WLD)
 - g. Shifted Load Detector (SLD)

- h. Wheel Impact Load Detector (WILD)
 - i. Skewed Truck Detector (STD)
 - j. Truck Performance Detector (TPD)
 - k. High Water Detector (HW)
 - l. Low Air Hose Detector (LHD)
 - m. Slide Fence Detector (SFD)
 - n. Derailment Detector (DRD)
 - o. Rock/Slide Detector (RSD)
 - p. Track Slump or Washout Detector (TSD)
 - q. Automatic Equipment Identification System (AEI)
 - r. Bridge Alignment Detector (BAD)
 - s. Weather
 - t. Wind Speed
 - u. Ambient Temperature
 - v. Rail Temperature
 - w. Rail Stress
 - x. Fire
 - y. Seismic
 - z. Machine Vision System (MVS)
 - aa. Wheel Profile Detector (WPD)
 - ab. Sliding Wheel Detector (SWD)
3. The WIS will report any anomalies observed to the train crew, and/or the rail traffic controller (RTC), ~~or dispatcher,~~ or back office, as

required. The train may then be stopped safely and under control prior to a catastrophic failure.

4. There are many components involved in the detection process that require proper testing and calibration.

a. ~~These System calibration and alignments is-are~~ critical to accurate detection of problems, as well as preventing false stops due to component drift or misalignment.

b. Periodic inspections, calibration, alignment and testings ~~shalleuld~~ be made and results recorded in accordance with railroad instructions.

5. The WIS ~~might will~~ be located in a very harsh environment. The railroad environment may contain Many conditions things that in this environment interfere adversely effect affect with the proper operation of the system. These conditions mayis-would include, but not be limited to, the following:

a. Weather – snow, rain, fog, condensation

b. Contamination – dust, dirt, chemicals, minerals

c. Freight car loading

d. Speed of train

e. Temperature

f. Track conditions

g. Vibration

h. Track lubrication

C. Considerations

1. Apply railroad required lock-out tag-out procedures when working with high voltage.
2. Work that may interfere with safe operation of trains shall not be started until train movements have been fully protected.

3. Temporary work, repairs, or adjustments shall be made in such a manner that safety of train operations shall not be compromised.
4. After repair, adjustment, change or replacement, of any components of a WIS, tests shall be made to determine that the WIS functions as designed.
5. When testing a WIS, only instruments approved by the railroad shall be used. Care should be taken to ensure that no unsafe conditions are created by the use of test equipment and that the test equipment is used only for its intended use.
6. Enclosures shall be locked or sealed, per the railroad instructions.
7. WIS enclosures should be kept clean and maintained so that no safety hazard exists.
8. Paint should be applied, as instructed by the manufacturer, when required.

D. Periodic Inspection

Note: For instructions for specific systems, see AREMA C&S Manual.

1. Pre Inspection Considerations
 - a. Review timetable listing, historical data from past inspections and alarm reports. This will help identify potential problems.
 - b. If WIS has modem, or other remote access capability, verify proper operation you can access the location. If not, take corrective action correct the problem when you are at the location.
 - c. Field personnel shall comply Familiarize yourself with railroad guidelines and instructions for trouble-shooting, verifying, testing, and calibrating the WIS.
2. Site Inspection Process
 - a. Check that current Plans are available, including manufacturer manuals or electronic storage of manual information.
 - b. Documentation should include any unique hardware or software options that must be configured.

- c. Verify that announcement recall or re-broadcast codes are correctly identified as well as exception only reporting.
- d. Verify that trackside equipment is clean, in good condition, and securely fastened in accordance with railroad and manufacturer instructions.
- b. Verify that proper signs are in place, if applicable.
- e. _____
- e.f. Alarm Levels should be recorded for reference.
- d.g. Verify correct Software Version is in use.
- e.h. Review WIS system logs for alarms, warnings, integrity failures, etc.
- i. Use the System Log Book and verify past calibration records, system failure findings, and test results are being recorded.
- j. Verify proper mitigation measures are in place to avoid solar interference (“sun shots”).
- f.k. Verify that track conditions are in accordance with manufacturer’s or railroad instructions.
- g.l. Backup Power
 1. Check the standby power (when used) ~~and that it is~~ maintained and ventilated properly.
 2. Gas byproduct of charging batteries or generator fuel may be explosive and dangerous to the personnel and the system.
 3. Follow the manufacturer’s instructions for charging and maintaining the batteries/generators.
- h.m. Wire and Cable Components

1. Wire Identification Check that wires are tagged or marked so they are identifiable at each termination point.
2. Wire Securing and Protection Check that insulated wire is free from damage, exposure to moisture, and protected and secured to prevent tampering or vandalism.
3. Test Equipment Cables Check that cables used are clean, dry, and not damaged.
4. Wire Underground Check that underground wire/cable locations are identified on the installation plans and protected from damage by track machines or contractors and that they are secured preventing rodent/insect entry.
5. Wire Pole Line & Aerial Cables Check that pole line and aerial cable is secured, preventing rodent/insect entry and meets clearance requirements.
6. AC Power and Components Check the AC power installation for compliance with railroad standards.
7. Wire and Cable Clearance Check that wires and cables that run near the rail are protected from the elements, rail movement, and damage including freezing and the possibility of vandals placing them on the rail. Eliminate any hazards associated with high voltage that could prove dangerous to rail employees or trespassers on the railroad right of way.
8. Wire and Cable Junction Boxes If junction boxes are used verify they are secured. All external connectors, where provided, should be checked to make sure they are tight and secured as designed.