**Training Aid**

**S&TC-1-1: Instructor’s Guide**

**49 CFR 236, Subpart A**

1. Circuit plans, location plans, and track profiles must be kept:
   1. At the signal supervisor’s office.
   2. At the signal maintainer’s headquarters.
   3. At the railroad’s headquarters.
   4. At each signal location.
2. Circuit plans, location plans, and track profiles must be:
   1. Correct and legible.
   2. Kept at each interlocking.
   3. Kept at each traffic control point.
   4. All the above.
3. Semaphore signals and searchlight mechanisms must be inspected every six months and tested:
4. At the same time.
5. Every two years.
6. Every five years.
7. Every ten years.
8. Each circuit, the function of which affects the safety of train movements, shall be kept free of any ground or combination of grounds which will permit a flow of current equal to or in excess of:
   1. 25 percent of the release value of any relay or electromagnetic device in the circuit.
   2. 50 percent of the release value of any relay or electromagnetic device in the circuit.
   3. 75 percent of the release value of any relay or electromagnetic device in the circuit.
   4. 100 percent of the release value of any relay or electromagnetic device in the circuit.
9. When testing for grounds a signalman must:
   1. Never test for grounds while a train is approaching the location being tested.
   2. Never leave an unobserved meter connected to a vital circuit and ground.
   3. Make the initial test using only a volt meter.
   4. All the above.
10. Securement of a signal instrument house can be by a lock that:
    1. Requires a key or tool to open.
    2. Thumb screw lock.
    3. Plastic wire ties.
    4. Snap latch.
11. By Federal regulation switch circuit controllers and point detectors must be inspected and tested:
    1. Every month.
    2. Every three months.
    3. Every six months.
    4. Every year.
12. The normal functioning of any device shall not be interfered with in testing or otherwise
    1. **Without first taking measures to provide for safety of train operation which depends on normal functioning of such device.**
    2. **Without first taking measures to provide for safety of train operation which depends on normal functioning of such device.**
    3. **Without first taking measures to provide for safety of train operation which depends on normal functioning of such device.**
    4. All the above.
13. All circuit that affect the safety of train operations must be designed using:
    1. Lancing principle.
    2. Closed loop principle.
    3. Dalio principle.
    4. Newton’s Law.
14. By Federal regulation shunt fouling circuits inspected and tested:
    1. Every month.
    2. Every three months.
    3. Every six months.
    4. Every year.
15. Before making adjustments to a switch circuit controller a person must:
    1. Ensure proper the controller is securely attached to the cross tie.
    2. Ensure that all switch rod connections are tight and secure.
    3. Check the circuit plans to understand how the controller is being used.
    4. All the above.
16. Control circuits for relays and other devices that affect the safe movements of trains must NOT be:
    1. Used to control highway signals.
    2. Selected through indicating or annunciating instruments.
    3. Selected through relays or other devices from another railroad.
    4. Selected directly through switch circuit controller of signal mechanisms.
17. Federal regulations require that any defective component or condition of a signal system which adversely affects the safe movement of trains must be:
    1. Repaired or replaced immediately.
    2. Repaired or replaced without undue delay.
    3. Repaired or replaced before the next train movement.
    4. b and c above.
18. Spring switches in interlockings and in ABS, ATS, ACS, and ATC territories installed after October 1, 1950 where the speed limit exceeds 20mph must:
    1. Be equipped with a switch circuit controller.
    2. Be provided with signal protection.
    3. Be inspected monthly.
    4. Be inspected annually.
19. The railroad’s timetable or special instruction must indicate designated?
    1. ABS, TCS, ATS, ATC and ACS territories.
    2. ABS, TCS, and Interlockings.
    3. ATS, ATC, ACS and Interlockings.
    4. Method of train operation.
20. By Federal regulation all circuits that affect the safe movement of trains must be tested for grounds:
    1. Every month.
    2. Every three months.
    3. Every six months.
    4. Every year.
21. If a main track release circuit is used at an electric switch lock location it must NOT be longer than:
    1. 75 feet.
    2. The block governed by the nearest signal.
    3. The maximum length of any car or locomotive that may operate over the switch.
    4. Sight distance for a crewmember standing at the switch.
22. Pipelines at mechanical interlockings must:
    1. Be made of the proper material and properly connected.
    2. Be adequately supported to prevent binding and properly compensated.
    3. Be assembled in such a manner that component pieces do not interfere with each other.
    4. All the above.
23. “Software management control plan” means
    1. A plan designed to ensure that each specific site and location is documented (mapped) and maintained with the latest version of the required software.
    2. A plan designed to ensure that the proper and intended software version for each specific site and location is documented (mapped) and maintained through the life-cycle of the system.
    3. A plan designed to ensure that each specific site and location is documented (mapped) to have been updated and that the older software version has been removed.
    4. All the above.
24. Each roadway signal shall be:
    1. Positioned and aligned so that its aspect can be clearly associated with the track it governs.
    2. Positioned and aligned so that its aspect can be clearly seen by a crewmember in the cab of a locomotive.
    3. Both a and b.
    4. None of the above.
25. How much clearance must there be between a semaphore signal arm and any object that may interfere with its operation:
    1. 1/16th of an inch.
    2. 1/8th of an inch.
    3. ¼ of an inch.
    4. ½ of an inch.
26. By Federal regulation all time releases, timing relays, and timing devices must be tested:
    1. Every month.
    2. Every three months.
    3. Every six months.
    4. Every year.
27. Federal regulations require that each railroad publish in its timetable or special instructions which of the following?
    1. How each signal aspect will be shown.
    2. The name of each signal aspect.
    3. The indicated action to be taken for each signal aspect.
    4. All the above.
28. Each Roadway signal shall be located with respect to the next signal or signals in advance which govern train movements in the same direction so the indication of the signal displaying a restrictive aspect can be complied with by:
29. Use of dynamic braking only.
30. A normal application of the train air brakes.
31. Using an emergency application of the train air brakes.
32. Using whatever means available to slow the train.
33. Track relay controlling home signals shall be in de-energized position, or device that functions as a track relay controlling home signals shall be in its most restrictive state, and the track circuit of an automatic train stop, train control, or cab signal system shall be de-energized in the rear of the point when the following condition exist:
    1. A rail is broken.
    2. A switch frog is removed.
    3. The track circuit or fouling circuit is occupied by a train, locomotive or car.
    4. All the above.
34. The minimum length of any track circuit is:
    1. The maximum wheelbase of any locomotive operating over the track circuit.
    2. The maximum wheelbase of any car operating over the track circuit.
    3. The maximum wheelbase of any locomotive or car operating over the track circuit.
    4. None of the above.
35. The maximum length of any “Dead Section” in a signal system must not exceed:
    1. 35 feet without installation of a special circuit.
36. The shortest outer wheelbase of any locomotive operating over the dead section without installation of a special circuit.
37. None of the above.
38. Two of the above.
39. Track circuits that control signal aspects or electric locking must be de-energized whenever a shunt of what value in placed across the rails of the circuit:
40. 0.006 ohms.
41. 0.06 ohms.
42. 0.6 ohms.
43. 6 ohms.
44. Where signal protection is provided at a switch turnout by a shunt fouling circuit two fouling wires are required at:
45. At the heel of the reverse switch point.
46. At the toe and heel of the switch frog.
47. Between the outer rails of the main track and turnout..
48. All of the above.
49. Rail joints in the fouling section of a turnout must be boned and the fouling section will extend at least:
50. 39 feet into the turnout from the heel of the frog.
51. To a point where sufficient track centers allow for clearance including maximum car overhang.
52. To a point where two locomotives with the maximum overhang used on the territory can clear each other at the turnout..
53. To a point where no two cars or locomotive can interfere with each other.
54. Insulated rail joints shall be maintained in condition to prevent sufficient track circuit current from flowing between the rails separated by the insulation to cause a failure of any track circuit involved applies to what systems?
55. Traffic Control Systems and Interlockings.
56. Automatic Block Signal Systems and Traffic Control Systems.
57. Highway grade crossings and Traffic Control Systems.
58. All systems.
59. A record must be maintained for:
    1. All tests and inspection required by Federal regulations.
    2. All tests required by Federal regulation.
    3. All inspections required by Federal regulation.
    4. None of the above.
60. Signal wires on pole line securely tied to an insulator and properly supported by a crossarm. Aerial cable:
61. Is considered to be line wire and must meet the same standard.
62. Must be supported by messenger.
63. Must be properly tied into a support bracket.
64. Must not be used in vertical runs.
65. No signal wires can be located closer than four feet from electrical transmission wire carrying:
66. 750 volts or more.
67. 240 volts or more.
68. 440 volts or more.
69. 110 volts or more.
70. All wires of signal circuit will be tagged. The tags will:
71. Identify the circuit.
72. Be made of insulating material.
73. Not interfere with any moving apparatus.
74. All the above.