**Training Aid**

**S&TC-0-1: Instructor’s Guide**

**History & Evolution of Signal Systems**

1. What invention prompted the first major advancement in train operations?
   1. The track circuit.
   2. The telegraph.
   3. The electric relay.
   4. The trainmaster.
2. The invention mentioned in Question 1 led to the development of what method of train operations?
   1. Absolute Block.
   2. Centralized Control.
   3. Automatic Block.
   4. Train Orders.
3. What invention for the first time provided a physical connection between the signal system and the train?
   1. The D.C. track circuit.
   2. The electric relay.
   3. The telegraph.
   4. The transistor.
4. The invention of the device mentioned in Question 3 led to the development of what form of railroad signal systems.
   1. Centralized Traffic Control (CTC).
   2. Automatic Block Signal System (ABS).
   3. Interlocking (INT)
   4. Track Warrant Control (TWC).
5. The first mechanical interlocking machines were designed to do what?
   1. Provide safer and more efficient train movements between stations.
   2. Provide safer and more efficient train movements at junctions and crossings.
   3. Provide safer and more efficient train movements into and through signal blocks.
   4. Provide safer and more efficient train movements in yard operations.
6. Mechanical Automatic Train Stop (ATS) was first installed in 1901 and became very popular in what type of train operations?
   1. Inter-city passenger service.
   2. Freight service.
   3. Commuter railroad service.
   4. Rapid transit service.
7. The first manual block signal systems required what component?
   1. A human operator to set the signals.
   2. A human dispatcher to coordinate train movements.
   3. A communications system.
   4. All the above.
8. Automatic Train Control (ATC) is a system that will:
   1. Automatically apply the train brakes until a target speed in achieved.
   2. Automatically operate the train, including station stops.
   3. Automatically stop the train if the operator fails to take appropriate action.
   4. All the above.
9. An arrangement of signals and signal appliances so interconnected that their movements must succeed each other in proper sequence is the definition of what type of system?
   1. Centralized Traffic Control (CTC).
   2. Automatic Block Signal System (ABS).
   3. Interlocking (INT)
   4. Track Warrant Control (TWC).
10. Automatic Block Signal Systems (ABS) increased efficiency of the railroad by allowing more than one train to move between stations in the same direction. What derivative of ABS also provided protection from trains moving in the opposite direction?
    1. Centralized Traffic Control (CTC).
    2. Automatic Permissive Block Signal System (APB).
    3. Interlocking (INT)
    4. Track Warrant Control (TWC).
11. In the early 20th Century two technologies were combined to form a new method of train operation. What were those two technologies?
    1. Manual block and automatic block.
    2. Track Warrant Control and automatic block.
    3. Interlocking and manual block.
    4. Interlocking and automatic block.
12. The two technologies mentioned in Question 11 resulted in the establishment of a new method of train operation called:
    1. Track Warrant Control (TWC).
    2. Absolute Permissive Block (APB).
    3. Traffic Control System (TCS).
    4. Interlocking (INT).
13. What are the two primary functions of an Automatic Cab Signal System (ACS)?
    1. Monitor the performance of the signal system and display performance information in the locomotive cab.
    2. Display signal aspects in the locomotive cab and stop the train if the operator fails to take appropriate action.
    3. Monitor locomotive performance and display the data to the operator in the locomotive cab.
    4. Monitor the wayside signal system and automatically adjust the speed of the train.
14. Where passenger train speeds are 60 or more miles per hour, or freight train speeds are 50 or more miles per hour:
    1. A block signal system shall be installed.
    2. A manual block system shall be placed permanently in effect.
    3. Both a and b.
    4. a or b.
15. American railroad signaling has evolved from:
    1. Mechanical technology.
    2. Electric technology.
    3. Digital electronic technology.
    4. All the above.