

What's the Answer?

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in. and one compartment 13 in. by 13 in. by 28 in. The ten compartments are large enough to hold a transmitter, receiver or power supply. The large compartment will hold portable test instruments and other test gear. A ½ in. plywood panel is spring-mounted on top of the rack. This panel has four bolts through it for the purpose of mounting a frequency monitor. A smaller compartmentized horizontal rack is built in behind the seats and in front of the

equipment rack. The compartments are of various sizes, and are for storing parts, accessories, tools, etc. Each vehicle is also supplied with a small folding table, large enough to set up the radio gear for testing. Thus, every maintainer supplied with a highway vehicle has, in effect, a complete traveling workshop, and can make a large percentage of repairs in the field. This means that only a minimum amount of spare equipment need be carried.

Train Operations When CTC Fails

If the CTC code line fails, how do you operate trains, i.e., authorize train movements until centralized traffic control is restored? If the communications circuits are also out of service, how do you operate trains until communications or CTC is restored? Please explain in detail.

Detailed Instructions

By A. L. ESSMAN

Chief Signal Engineer
Chicago, Burlington & Quincy
Chicago, Ill.

On the Burlington, we handle the operation of trains under CTC failure in two ways: (1) code line or CTC failure only; and (2) CTC and communications line circuit failures. We have procedures involving the use of train orders set up to handle each type of situation. When the CTC fails, the dispatcher or CTC operator is, of course, the first to know. He then calls the signal maintainer, and subsequently notifies the signal supervisor and the superintendent. The superintendent and signal supervisor confer about the nature of the failure. If, in the opinion of the signal supervisor, CTC must be taken out of service, instructions are issued.

Signals inoperative but communication facilities available. First we establish train order and block offices by train order, at points where we have operators but no train order signals, and require trains to receive Clearance Form "A" at such points.

The signal maintainer changes all selector levers on dual-control switches, throughout the limits involved, from power to hand operation, and locks them in this position with a signal lock. In the event the signal maintainer cannot get to the

switches, the first train, through the limits of failure, is instructed to change all selector levers on dual-control switches from power to hand operation, and lock in this position with switch locks. Emergency switch locks for this purpose will be located in telephone boxes or booths.

A "31" train order is issued to all trains and operators within the limits involved, and to all other trains before they enter these limits. On single track, the order reads: "CTC and Automatic Block System is suspended between ——— and ——— and movement of trains will be governed by timetable and train orders. Trains (direction) are superior to trains of the same class (direction). Extra trains will display classification signals. Manual Block Rule 318 (B) in effect. All switches must be hand operated. Trains must approach interlocking prepared to stop at home signal and interlocking rules will govern. Trains must stop and inspection be made of points before passing over facing-point spring switches."

On double track, the order reads: "CTC and Automatic Block System is suspended between ——— and ——— and movement of trains will be governed by timetable and train orders. Rules D-151, D-152, and Manual Block Rule 318(B) in effect. All switches must be hand operated. Trains must approach interlocking prepared to stop at home signal and interlocking rules will govern. Trains must stop and inspection be made of points before passing over facing point spring switches."

If no interlocking or spring switches are involved, reference to such in the train order is omitted.

When CTC operation is resumed, all dual-control switches are restored

to power by the signal maintainer. All trains within the limits are stopped, and delivered a "31" train order annulling the suspension order, and the order is annulled at the points where issued for other trains and operators.

When the communications circuits also fail, our first job is to provide emergency communications. For this purpose, we resort to radio. We have 50 fixed antennas strategically located at stations in our CTC territories, and we have portable 30-watt radio transmitter-receivers that we can "plug-in" to these antennas. Each antenna is mounted atop a high wood pole adjacent to the depot, with the lead brought into a plug coupler near the operator's desk. Also available is 110-volt commercial a.c. to operate the radio. We set up these temporary radio stations at each end of the CTC territory affected by the failure, and at as many intermediate points as necessary to provide through communication from one end of the territory to the other. In case the commercial a.c. is out at any one of these stations, we use the gas-engine generator, that is normally used to supply current for electric tie tampers to supply power. A voltmeter on the end of the radio set is marked with a red area, and the section man operating the engine-generator "revs 'er up" until the needle of the voltmeter is in the "red," which indicates that the generator is delivering 110 volts a.c. to the radio equipment.

Now that communications is established by radio, the signal maintainer, accompanied by two or three operating officers, as the situation may require, start out to place all dual-control switches on hand throw, lock in this position with a signal lock, and deliver the "31" suspension order to all trains and operators within the limits suspended. The officers, before starting out, should have a positive lineup between themselves and the train dispatcher, if in communication with him, as to just how stranded trains will be flagged out of this territory.

After these trains have been moved out of the limits of failure, the signatures of the "31" suspension order have been transmitted to the train dispatcher, and the signal maintainer has reported all dual-control switches on hand-throw, other trains are released to move on timetable and train order authority.

Until communication is established at sufficient intermediate points, we do not attempt to establish manual block. But trains are spaced 10 minutes as provided by Rule 91.

When CTC operation is resumed, if communication has also been restored, the same procedure should be followed as where we have had communication. If communication is still interrupted, "31" train orders annulling the suspension of CTC are delivered by an operating officer or signal maintainer to all trains and operators within the limits of no communication, and the signatures are transmitted to the train dispatcher before any other trains may enter such limits.

In both cases, "Failure of CTC" or "Failure of CTC and Communication," passenger trains are restricted to 50 mph, freight trains to 35 mph.

After CTC operation is resumed, the radio sets are disconnected and returned to the signal supervisors' headquarters, where they are kept when not in use.

In addition to the above instructions, we have a "practice alert" about once every six months, to train everyone in the procedures to follow if the communications should fail. Only the chief dispatcher and one or two others know the date and time of the alert. When the time arrives, the chief starts the "ball rolling" on these emergency instructions. Each man acts as though trains were not running, and the maintainers, signal and operating officers are notified of a simulated failure. The emergency radio stations are set up and put into operation.

Walkie-Talkies

When providing walkie-talkies as auxiliary radio on caboose and/or locomotives, are the radios taken from the caboose after each run, or are they left in the caboose and taken out only for use by the train crew, and for battery charging?

Packsets Removed After Each Run

By C. J. NELSON
Assistant Superintendent
Communications
Chicago, Rock Island & Pacific
Chicago, Ill.

The Rock Island utilizes only walkie-talkies in its cabooses for radio communication. These are normally mounted in racks and connected to an antenna on the top of the caboose. In emergency they may be removed from the rack and the fixed antenna replaced with a short whip, allowing them to be carried alongside the train for direct communication to the diesel.

These sets are turned in by the conductor at the end of the run to a yard clerk, or some other designated individual, who then removes the batteries and charges them. When the set is again issued, a freshly charged set of batteries are installed and the walkie-talkie checked with the local base radio station to be certain it is operating properly.

Auxiliary Use

By S. W. MILLER
Superintendent of Communications
New York, Chicago & St. Louis
Cleveland, Ohio

Walkie-talkie type radio sets are provided in cabooses on the Nickel Plate as auxiliary radio sets. As the assigned caboose system is used, the walkie-talkie type sets are left on the cabooses, and only removed in case of set trouble when a spare set is substituted.

One-watt storage battery sets have proven to be very satisfactory for auxiliary use. The storage battery cells are replaced with fully charged cells by electricians when cabooses are placed on repair tracks for their monthly checks.

Left in Caboose

By H. W. BURWELL
Telephone Engineer
Louisville & Nashville
Louisville, Ky.

On the Louisville & Nashville the walkie-talkies are assigned to the caboose. We use the dry battery type of power supply. The walkie-talkies are left in the caboose after each run and are given a talking test by the maintenance force using the station on the caboose as a monitor. In case trouble is reported by the crew or improper operation is noted by the test, the set is replaced and sent to the radio shop for repairs. Our failures with walkie-talkies on line-of-road have been negligible.

Dry-Battery Sets

By R. W. TROTH
Superintendent
Communications & Signals
St. Louis-San Francisco
Springfield, Mo.

We have packsets as auxiliary radio equipment on all our radio-equipped cabooses. None are assigned to engines. Dry battery sets are used exclusively, and we do not have the problem of battery charging. Sets remain with the cabooses either until they fail or until they are removed for maintenance. All radio

cabooses are pooled on the Frisco, and packsets are checked along with the standard radio as the cabooses pass through our larger terminals where we have maintainers on duty.

Sets Assigned

By R. B. HENDRICKSON
Signal Engineer
Chicago, South Shore & South Bend
Michigan City, Ind.

On the South Shore, each caboose has a walkie-talkie assigned to it. This set remains in the caboose at all times except when removed by the train crew to aid in switching operations, or when removed for a service check or repairs. These walkie-talkies are powered by dry batteries, and thus do not require removal for battery charging.

Signal Lamp Test

Do you test signal lamps by burning them a certain number of hours before placing them in service? Why or why not? Please give reasons.

Observe When Installed

By E. P. STEPHENSON
Signal Engineer, System
Canadian National
Montreal, Que.

The only testing carried out in general on Canadian National consists of observing the lamp for a few minutes after it is installed, to see if it burns with excessive brightness or the bulb clouds. If operation appears normal, then the lamp is considered satisfactory. Our experience has been that this testing is satisfactory and that more elaborate tests are not warranted.

10-Min. Check

By T. L. CARLSON
Superintendent of Signals
Chesapeake & Ohio
Richmond, Va.

On the C&O we do not burn signal lamps a certain number of hours before placing them in service. We do burn all lamps for about 10 min. to test for defective filaments. A number of years ago we burned lamps a certain number of hours, but we could not definitely determine that there was any true relation between lamp failures and "burning in" periods. We believe that the 10 min. check we are giving lamps is as effective in holding down lamp failures as our former longer burning periods.