

REMOTE-CONTROL LOCOMOTIVES

Key Facts

- RCLs have improved rail yard safety for over 20 years.
- Only specially trained employees operate RCLs.
- The FRA doesn't have specific concerns about RCLs.

For more than 20 years, freight railroads have successfully used Remote-Control Locomotive (RCL) technology. Also known as Remote Control Operations, RCL enhances the safety and efficiency of locomotive operations within rail yards.

REMOTE-CONTROL LOCOMOTIVES ARE SAFE.

Widely accepted throughout the industry, RCL has proven to be as safe or safer than conventional methods in facilitating yard operations. RCL has been longstanding and extensively considered by the FRA. In 2023, FRA [noted](#) that “there are no specific concerns with the use of remote-control operators.”

RAILROADS PRIMARILY USE REMOTE-CONTROL LOCOMOTIVES IN YARDS FOR ESSENTIAL TASKS LIKE BUILDING TRAINS.

A Remote Control Operator (RCO) can stand anywhere along the train, reverse the locomotive, and stop it precisely—without relaying directions over the radio. By controlling the locomotive from a safe distance, Remote Control Locomotive (RCL) technology reduces accident risk and improves efficiency through optimized train movements.

TRAINED EMPLOYEES OPERATE REMOTE-CONTROL LOCOMOTIVES.

All RCO employees hold FRA certification and receive specialized remote-operation training. They follow safety standards and operating rules equal to those for locomotive engineers. FRA regulations require ground employees to maintain line of sight or establish zones where only one RCL operates. RCOs also undergo continuous testing, including tri-annual recertification and an annual supervisor “check ride.”

CLASS I REMOTE-CONTROL LOCOMOTIVE OPERATIONS GENERALLY WORK THROUGH A TRIFECTA OF REMOTE OPERATIONS, SAFETY FEATURES AND MONITORING.

Remote Operation & Monitoring

One or two RCOs stationed near the train or on the locomotive itself use transmitters called Operator Control Units (OCUs) to communicate with and operate the RCL. The operator can remotely control locomotive movements within the rail yard or industrial facility, including acceleration, deceleration,

direction, and other functions necessary for shunting, coupling and uncoupling cars. The control system typically provides real-time feedback to the operator, allowing them to monitor the status of their locomotive, track their movements and respond to any issues or alarms that may arise during operations.

Safety Features

Remote control systems use multiple safety features to prevent mistakes and accidents:

- **Man Down:** OCUs stop the locomotive and send an emergency radio alert if the operator falls. Operators test this feature at the start of each shift.
- **Vigilance Test:** OCUs stop the locomotive after an audible warning if the operator shows no activity and fails to press a button.
- **Registration:** OCUs register digitally to the assigned locomotive to ensure operators control only their intended unit.

RCO TIMELINE

Early train operations relied on manual control by skilled engineers, requiring precise coordination for safety. Since the 1970s, railroads and industrial customers have advanced RCL technology, enabling operators to control movements accurately and reduce miscommunication errors.

- **1970s:** Customer industrial sites begin using RCL in the U.S. and Canada.
- **1980s:** Canadian National begins extensively using RCL to support safe, efficient yard operations. During this time, CN pioneered the “speed control,” whereby the operator selects a speed, and the onboard computer decides on brake and throttle settings.
- **1992:** FRA attends a demonstration of RCL technology on the Wheeling and Lake Erie Railway.
- **1994:** FRA begins reviewing RCL safety with its first hearing in 1995. At this time, no regulatory action is taken. During this year, FRA also grants a waiver to experiment with the technology.
- **1995-1996:** FRA holds hearings in DC and Appleton, WI.
- **July 2000:** FRA holds a technical conference with all parties to discuss how the technology is being used, the safety of its use and lessons learned from operations to date. The goal of that meeting is to inform the development of best practices for RCL usage.
- **February 2001:** FRA issues a safety advisory outlining recommendations and guidance for RCL operations based upon the July 2000 conference.
- **September 2003:** Senate Commerce asks the FRA to assess the impact and safety of RCL operations.
- **May 2004:** FRA provides an interim report to Congress noting that RCL accident rates were 13.5% lower than train accident rates caused by conventional switching operations and employee injury rates were 57.1% lower for RCL operations than for conventional switching operations.

- **March 2006:** FRA releases their most comprehensive analysis on RCL technology, which found in part that RCL operations were as safe as conventional operations. “The FRA encourages the advancement of modern technology into the rail industry, for both efficiency and safety. The future of the country’s rail transportation system depends on it. As stated above, FRA’s assessment of RCL operations shows that these operations currently appear as safe as conventional operations.” (P. 11)
- **2008:** FRA provides guidelines for training, including on-the-job training for RCL operations.
- **2014-2016:** Through the RSAC process, FRA again considers RCL operations. No regulatory action is taken based off those meetings. FRA has oversight for RCL training (see Part 240 Locomotive Engineer Certification) and has holds periodic conversations with the industry about training practices for RCOs.