RGPC Remote Control Locomotive Operator Training Course for Certified Locomotive Engineers

Learning to Operate the Cattron Quick Connect RCLS in 24 Hours
The Course

- Six Sessions of between two and eight hours duration—24 hours total
- Combination of field exercises and classroom—emphasis on hands-on
Review

- The Basics
- Rules
- Switching Operations
You’ll Learn How To:

- Start the remote and test its operation
- Operate the RCLS safely and efficiently
- Shut down the RCLS and secure locomotive when finished
Agenda—Session One

☐ Job Briefing and Orientation
☐ Definitions
☐ Distribute training and operating materials
☐ Introduction to OCU
☐ Review safety procedures, operating rules and instructions
Agenda—Session Two

- Job Briefing
- Field demonstration, to include equipment set up and operation
  - OCU, LCU, Tilt Feature, Failure Recovery Hands-on use of remote control (without cars):
  - Equipment set up (Remote Mode)
  - Controlling direction of movement
  - Using throttle and brake
  - Emergency brake applications
- Charging train brake systems
- Transferring operator control from one OCU to another OCU
- Mounting the Equipment on the Locomotive
  - Two-person job
- Equipment set up (Manual Mode)
Agenda—Session Three

- Job Briefing
- Quiz
- Classroom
  - Set Up and Testing (just highlight the equipment mounting part for now)
  - Operating
  - Securing the Equipment
  - Remote Control Zones
  - OCU Functional Description
  - Quiz
- Field Exercises (Hands On—with cars)
  - Light engine and with cars and Coupling
  - Cutting cars off in motion (kicking)
Agenda—Session Four

- Job Briefing
- Periodic Inspection of Equipment
  - Battery packs
- Hands-on operation
Agenda– Session Five

- Job Briefing
- Review
- Hands-on instruction
- Demonstration of proficiency
Agenda—Session Six (Final)

- Job Briefing
- Final Test—written
- Final field evaluation by instructor
The Basics--I

- Why are we doing this?
  - It’s a safer, more efficient way to operate.

- What if there are problems? What do we do?

- Please—don’t just complain—be a part of the SOLUTION!
The Basics--II

- Always be aware of direction of movement
- Always be aware of where your body is in relation to tracks and moving equipment
- Provide point protection where required
- Mounting the Quick Connect boxes/Equipment on to the locomotive is a 2-person job. *Never attempt to do this alone.*
- Daily locomotive inspection report to include comment on condition/operation of the RCL Equipment.
The Basics--III

REPORTS:

- Time Return—note:
  - Who was EIC
  - Number of ours spent in remote operation, number non-remote

- Locomotive Inspection
  - Note defects and operation of RCL equipment

- Accident/Incident Reporting
  - Note if using RCL
What is the difference between our RCL equipment and the UP’s?

- FRA Requirements for Operators
  - Must be certified engineer to operate ours

- Cost
  - Ours is about half the cost of UP’s

- Ours is called a “Throttle and Brake” model of Remote Control

- UP’s is called “Computer Controlled”
REMOTE CONTROL (RC)—

- The process of operating locomotives via a radio frequency established between a qualified operator using an operator control unit (OCU) and a locomotive control unit (LCU) so that the locomotive operates in the same manner as if the operator were using the controls in the cab of the locomotive.
Definitions
REMOTE CONTROL LOCOMOTIVE (RCL) —

- A locomotive (an engine, or more than one engine coupled and MU’d together) capable of being operated by an operator on the ground using an operator control unit (OCU).
REMOTE CONTROL LOCOMOTIVE SYSTEM (RCLS)

☐ Term used to describe the entire system for operating a remote control locomotive; to include the OCU, the LCU, and any other equipment required in practice or by rule (such as strobe lights/beacons, signage, harnesses, connecting hoses, electrical cables, mounting brackets, radio transmission repeaters).
REMOTE CONTROL OPERATOR (RCO)

- A locomotive engineer with a valid engineer’s license who has been trained and certified as a remote control locomotive system operator.
REMOTE CONTROL LOCOMOTIVE SYSTEM-EMPLOYEE IN CHARGE (RCLS-EIC)

☐ For each tour of duty on which two operator control units (OCU) are used by a single RCL crew, one RCO must be designated as the RC)-EIC for purposes of controlling entrance of other trains, engines, employees, and contractors into the Remote Control Zone. The crewmembers will jointly determine the RCO-EIC for that tour of duty and promptly notify the dispatcher or other designated person (s).
At different times during a tour of duty using the RCLS with two OCU’s, one RCO will be the primary RCO, depending on his position on the ground and other circumstances. The primary RCO will control RCL movement at all couplings. The primary RCO will not always be the RCLO-EIC.
REMOTE CONTROL ZONE (RCZ)

Any section of track, to include main line and/or yard or industry tracks, the limits of which are designated by General Order or Timetable and/or by posted signs on the right of way, in which a remote control system may operate according to rules established for that purpose.
ACTIVE REMOTE CONTROL ZONE (ACTIVE RCZ)

- A designated remote control zone made active by General Order or Timetable for certain hours of specified days of the week, or made active by Track Bulletin, or made active by authority of the dispatcher via radio or telephone. If the RCZ is activated by Track Bulletin or verbal authority, all employees or contractors who might have occasion to enter the ACTIVE RCZ must be notified before the RCZ is activated.
OPERATOR CONTROL UNIT (OCU)

- A portable unit attached to the RCL operator (RCO) with a harness or specially designed vest, equipped with controls duplicating the key controls in the locomotive cab, operating on a designated radio frequency, used by the operator to control the movement of the remote control locomotive.
TILT Feature

- This safety feature is built into the OCU so that when the OCU is tilted at more than a 45 degree angle for 5 seconds, the OCU sends a signal to the Locomotive to initiate an emergency brake application.
VIGILANCE SWITCH

- A safety device that requires the operator to either press the switch button or operate some other switch on the OCU every 60 seconds. Failure to do so places the RCL into Full Service Reduction position.
QUICK CONNECT (QC)

- This term is used by Cattron, the manufacturer of our railroads’ remote control system, to apply to its product that provides for the use of any locomotive with MU capabilities to be quickly connected and used as a remote control locomotive without the need for extensive rewiring and re-piping of the individual locomotive unit. The QC is completely portable and easily moved from one locomotive to another. The QC is actually two boxes which are connected with an electrical cable after mounting on the locomotive—the LCU box and the EPI box.
LOCOMOTIVE CONTROL UNIT (LCU)

- The first of two boxes comprising the Quick Connect (QC) system. This box contains the electronic controls for communicating between the locomotive and the OCU. This box is easily distinguished by cable receptacles on the side of the box.
ELECTRO-PNEUMATIC INTERFACE (EPI)

- A completely self-contained unit that is connected to, and controlled by, the LCU. When connected to the Locomotive Pneumatic System by way of the MU connectors, the EPI allows the Automatic and Independent Braking systems to be operated under remote control. This box is distinguished by the air hose connectors on the bottom of the box.
Diagrams and Pictures of LCU/EPI and OCU--Following
LCU/EPI—the Quick Connect Boxes

- Enclosures to be mounted less than 10 Feet apart
LCU Inside
LCU/EPI Boxes
Locomotive Tag
LCU/EPI Boxes
1. 'POWER ON/OFF' SWITCH
2. DIGITAL READOUT
3. 'HORN' PUSHBUTTON
4. 'EMERG' PUSHBUTTON
5. BELL 'ON/OFF' SWITCH
6. 'VIGILANCE' PUSHBUTTON
7. SAND 'ON/OFF' SWITCH
8. 'LOW BATTERY/TRANSMIT' LED
9. THROTTLE CONTROL
10. LED INDICATOR PANEL
11. DIRECTION CONTROL
12. ANTENNA
13. INDEPENDENT BRAKE CONTROL
14. 'BAIL' PUSHBUTTON
15. AUTO BRAKE CONTROL
16. 'TILT EXTEND' PUSHBUTTON
POWER ‘ON/OFF’ SWITCH

- Used to apply power to the OCU.
OCU Buttons/Readouts
DIGITAL READOUT

- Allows the operator to review ‘real-time’ status indications from the Locomotive. Typically, such indications will be:
  - Throttle Notch Selected
  - Independent Brake Pressure
  - Train Brake Pressure
  - Warning and Alerter messages
HORN

☐ This (momentary ‘ON’) push-button switch activates the locomotive horn.
EMERG

- This latching pushbutton switch is used to stop the locomotive in an emergency. When the pushbutton switch is depressed, the locomotive throttle will be returned to ‘IDLE’ and the brakes set to ‘EMERGENCY’.
BELL

- Two-position toggle switch used to ring the locomotive bell.
VIGILANCE SWITCH

A safety device that requires the operator to either press the switch button or operate some other switch on the OCU every 60 seconds. Failure to do so places the RCL into Full Service Reduction position.
SAND ON/OFF

- Applies sand in the direction of travel. Sand will also be commanded automatically when a wheel slip condition is detected.
LOW BATTERY/TRANSMIT’ LED

☐ This LED flashes green when the OCU’s Power ON/OFF Switch is set to ‘ON’ and the controller is transmitting with a good battery installed.

☐ The LED flashes red when the battery is low and sounds a beep to alert the operator.

☐ A low battery cut-off circuit stops the OCU’s micro-processor when voltage goes below safe operating range.
THROTTLE CONTROL

- Paddle lever has a “spring return to idle”. Eight individual throttle steps are available corresponding to the eight steps available from the locomotive’s manual throttle.
LED INDICATOR PANEL

- Each LED indicator provides the operator with ‘real-time’ status indications from the Locomotive. Typically, such indications will be:
  - Locomotive Direction (Forward or Reverse)
  - Throttle Advanced
  - Wheel Slip
  - Engine Alarm

- Note: When the Engine Alarm indicator is illuminated, it will remain latched, requiring the operator to return to the locomotive to investigate and correct the alarm condition. This alarm condition will disable the throttle and apply the independent brakes until the fault condition is corrected and the ‘ALARM RESET’ pushbutton on the LCU cabinet is depressed.
DIRECTION CONTROL

- Paddle lever with three separate 'zones' of operation: FORWARD, NEUTRAL, and REVERSE.

- Typically, direction cannot be changed until the throttle selection is in ‘IDLE’ for more than 3 seconds.

- If a change in direction is commanded with the throttle advanced, the throttle is returned to idle signifying an illegal direction change.
ANTENNA

- Allows 2-way RF communication between the OCU and QC LCU
INDEPENDENT (locomotive) BRAKE CONTROL

- Paddle lever has ‘RELEASE’ plus eight steps of braking (5 pound increments up to 45 pounds). When ‘RELEASE’ is commanded, the independent brakes will release.
- When the lever is moved to any of the remaining positions, the LCU computer will maintain the requested pressure in the independent brake control pipe.
BAIL PUSHBUTTON

- Duplicates the independent brake-bail feature available on the manual control stand.
AUTOMATIC TRAIN BRAKE CONTROL

- Paddle lever has ‘RELEASE’ plus four steps of braking (7 pound reduction, 10 pound, 15 pound, 27 pound)
- When ‘RELEASE’ is commanded, the automatic brakes will release.
- When the lever is moved to any of the remaining positions, the LCU computer will maintain the requested pressure in the train brake control pipe.
TILT EXTEND SWITCH

- Extends time the OCU may be in “tilt” position from typical 5 seconds before placing RCL throttle into IDLE and initiating full Emergency Brake Application to allow the operator of the OCU, by pressing this switch, to gain an extra 50 seconds to bend over, throw switches, etc. without triggering the tilt feature.
- It does sound the alarm but does not activate the penalty brake application.
- There is an indication on the OCU’s LED display when the tilt bypass feature has been activated.
- Should the amount of time in tilt bypass be exceeded, the throttle will return to idle and full-service brake application initiated.
OCU Status Messages

- What they say, what they mean
OCU Status Messages

- **EMERG BRAKE** -- An EMERG braking application has been commanded by the OCU.

- **OCU TILTED** -- An OCU TILT condition has been detected.

- **AUTO BRAKE FAULT – CHECK LCU** -- An Automatic brake check fault has been detected. A pressure greater than the commanded brake reduction has been detected for a predetermined length of time. The fault must be corrected and then cleared on the LCU by pressing the ALR/RST pushbutton located on the LCU box.

- **RECOVER EMG PENALTY** -- The operator must perform an EMG Penalty recovery procedure.
OCU Status Messages

- INVALID DIR CHANGE -- A direction opposite the previously selected direction is detected for 20 seconds while a throttle position other than idle is selected.

- ENGINE ALARM DETECTED – CHECK LCU -- An Engine Alarm from the Locomotive has been detected. The fault must be corrected and then cleared on the LCU by pressing the ALR/RST pushbutton located on the LCU box.

- IND BRAKE FAULT-CHECK LCU -- An Independent brake check fault has been detected. A pressure less than the commanded pressure has been detected for a predetermined length of time. The fault must be corrected and then cleared on the LCU by pressing the ALR/RST pushbutton located on the LCU box.
OCU Status Messages

- **LCU FAULT – CHECK LCU -- RS485 check fault has been detected or a decoder fault has been detected.** This is an internal LCU fault. The fault must be corrected and then cleared on the LCU by pressing the ALR/RST pushbutton located on the LCU box.

- **RECOVER FS PENALTY --** The operator must perform an EMG Penalty recovery procedure.

- **LOW MR AIR PRESS --** Low air pressure has been detected on the Main reservoir. Once the low air condition goes away, the throttle must be returned to idle & Vigilance button pressed to clear the fault.

- **RECOVER SERVICE PENALTY --** Neutral is selected, or a direction opposite the previously selected direction is detected.
OCU Status Messages

- COMM LOSS -- A radio frequency Communication fault has been detected.
- VIGILANCE EXPIRED – RECOVER FS PENALTY -- The vigilance timer has expired. The operator must recover a FS penalty to clear this fault.
- THROTTLE SELECT WITHOUT VIG PB -- The throttle lever has been moved from the idle position without first pressing the Vigilance pushbutton. To clear this condition, return the throttle lever to the idle position.
- STUCK VIG PB -- A stuck Vigilance pushbutton has been detected. The fault must be corrected and then recover a FS penalty
Rules and Instructions for RCLS Operation (1.1)

- Employees assigned to and working on a remote control (RC) crew are governed by these instructions and must have a current copy they can refer to while on duty.
Rules and Instructions
Rules and Instructions for RCLS Operation (1.2)

- Job briefing must be held among all crewmembers.
- All RCLS crewmembers must be informed and clearly understand which crewmember is controlling movement of the RCL at all times (the primary RCO), and who is the RCL-EIC.
- Before the control of the OCU can be transferred from one crewmember to another, the receiving RCO must be notified and acknowledge they are in a position to assume control.
A crewmember must not go under or between cars coupled to a RCL (enter the Red Zone) or when a RCL is on the same track until each member of the crew has been informed of the work to be performed.

The RCO must ensure that the OCU’s throttle is reduced to idle, and the independent brake is APPLIED.
The RCO must acknowledge that he/she understands that another employee will be entering the Red Zone announcing via radio “set and centered.”

The throttle control, direction control, and air brakes must not be repositioned on the OCU or control of the OCU transferred to another operator until each crewmember has advised the RCO that they are “in the clear.”
Each RCL crewmember shall be equipped with an operative holstered hand-held radio equipped with a wired microphone.
Rules and Instructions for RCLS Operation (1.5)

- OCUs must not be left unattended unless secured.
- Spare OCUs shall not be stored with batteries installed.
- The LCU will not permit control from more than one OCU at one time
When cars or engines are shoved and conditions require, a crewmember must take an easily seen position on the leading car or engine, or be ahead of the movement to provide protection unless the leading end of the movement is within an active RCZ.
Movements past any block, interlocking, or controlled signal (regardless of indication) or through an interlocking shall be made only when a RCL crewmember, or other authorized employee who can signal or communicate with the RCL crew, has taken a position where the signal aspect can be observed and the indication is PROCEED.
Rules and Instructions for RCLS Operation (1.8)

Movements over public crossings at grade must be made only when a RCL crewmember, or another qualified person, has taken a position where the crossing and crossing signals can be observed.
Rules and Instructions for RCLS Operation (1.9)

- Prior to leaving the locomotive cab to operate the RCL from a position other than in or on the locomotive, a RCL crewmember must place a tag on control stand indicating the locomotive is in REMOTE mode. The tag must be removed and secured when placing the locomotive into MANUAL mode.

- If tag is unavailable, a handwritten message must be used.
Rules and Instructions for RCLS Operation (1.9--tag)
Rules and Instructions for RCLS Operation (1.10)

- Operation of passenger or excursion trains with RCLS is prohibited.
Setup and Testing

- Prior to operating the RCLS, ensure the proper setup and testing procedures are completed.
- If two control units are to be used in shared operations, test both.
- Requirements for Locomotive Air Brake testing must be followed in accordance with Rule 30.3.3 (modified).
RCLS Operations
RCLS Operation

- Only Certified RCO’s are permitted to operate the RCLS.
- A RCO shall control only one RCL consist at a time, and shall not operate simultaneously any other locomotive.
- Dropping cars while in REMOTE mode is prohibited.
RCLS Operation

- When using a Remote Control locomotive to make a coupling, the RCO located at the coupling must be the primary RCO.
- Only operate the RCL remotely from the ground, or while riding or standing on locomotive, freight car, or a caboose platform.
- Do not operate the RCLS from a motorized vehicle.
RCLS Operation--Changing control of the RCL from one operator to the other in a shared control situation

- Bring movement to a stop.
- Switch OFF controlling (primary) OCU (OCU 1).
- Switch ON the new primary OCU (OCU 2).
- Recover from full-service application
- Verify control has transferred by activating horn or other control on OCU 2.
- Ensure all crewmembers understand which operator is controlling movement (job briefing).
- On the first move of the RCL, move it slowly and make sure it is under your control.
RCLS Operation—Tilt Activation and Recovery

- Tilt switch activation causes an emergency brake application, returning the RCL throttle to idle, and setting all air brakes.
- THE OCU causing the tilt switch activation is the OCU that must be used to recover from the shutdown.
- The “man-down” feature is an automated process that broadcasts an emergency message over the locomotive radio
  - Broadcasts once per minute until the operator corrects the activation condition and recovers
Tilt Bypass

- Allows RCO to press the switch and:
  - Gain extra 50 seconds to bend over, throw switches, etc. without triggering the tilt feature.
  - Does sound the alarm but does not activate the penalty brake application.
  - Indication on the OCU’s LED display when the tilt bypass feature has been activated.
  - If tilt bypass time is exceeded, the throttle will return to idle and full-service brake application initiated.
Recovering from Stop Condition

- Identify the reason for the STOP condition
  - *NOTE: Operator Control Unit commanding an Emergency or Full Service shutdown must be the one to recover.*
Stop Condition---**EMERGENCY APPLICATION**

- **Cause**
  - An EMERG brake has been commanded by the OCU.
  - An OCU TILT condition has been detected.
  - An extremely low pressure has been detected on the Automatic Brake Pipe.
  - An Automatic brake check fault has been detected. A pressure greater than the commanded brake reduction has been detected for a predetermined length of time. The fault must be corrected and then cleared on the LCU by pressing the ALR/RST pushbutton located on the LCU box.
  - When any of these events occur a full independent brake and emergency brake application is commanded with the throttle returned to IDLE.
Stop Condition--*Recovery from Emergency:*

1. Return Throttle to idle.
2. Place Independent brake lever into 45LB (Full Service) application.
3. Place Automatic brake lever into 27LB (Full Service) reduction.
4. Depress Push-To-Operate bar or Vigilance pushbutton.
5. Place Automatic brake lever into REL position
Stop Condition--**FULL SERVICE PENALTY -- 1**

- **Cause**
  1. A direction opposite of the previously commanded direction is detected for 20 seconds while a throttle position other than IDLE is selected.
  2. An Engine Alarm from the Locomotive has been detected. The fault must be corrected and then cleared by pressing the ‘ALARM RESET’ Pushbutton located on the LCU Enclosure.
  3. An Independent brake check fault has been detected. A pressure less than the commanded pressure has been detected for a predetermined length of time. The fault must be corrected and then cleared by pressing the ‘ALR/RST’ Pushbutton located on the LCU Enclosure.
Stop Condition—**FULL SERVICE PENALTY -- 2**

**Cause**

4. A “RS485” check fault has been detected. This is an internal LCU fault. The fault must be corrected and then cleared by pressing the ‘ALR/RST’ Pushbutton located on the LCU Enclosure.

5. A decoder fault has been detected. This is an internal LCU fault. The fault must be corrected and then cleared by pressing the ‘ALR/RST’ Pushbutton located on the LCU Enclosure.

6. A radio frequency Communication fault has been detected; for example, the OCU moves out of communication range of the LCU.

7. If Vigilance time (greater than 60 seconds) expires.

8. If system detects that Vigilance button is stuck down.
Stop Condition--**FULL SERVICE PENALTY** -- Recovery

1. Return Throttle to idle.
2. Place Independent brake lever into 45LB (Full Service) application.
3. Place Automatic brake lever into 27LB (Full Service) reduction.
4. Depress Vigilance pushbutton.
5. Place Automatic brake lever into REL position.
Stop Condition--**Service Application**

Full independent brake application is commanded, and the throttle is returned to idle.
Stop Condition--Service Application

Causes:
1. Low air pressure has been detected on the Locomotive's Main Reservoir. Once the low air condition has cleared, return OCU THROTTLE Lever to ‘IDLE’ and depress the Vigilance Button to clear the fault.
2. NEUTRAL is selected on the OCU.
3. A direction opposite of the previously commanded direction is detected.
4. Automatic brake pressure less than 45psi is detected.
Stop Condition--Service Application -Recovery

**RECOVERY FROM A ‘SERVICE APPLICATION’ SHUTDOWN occurs automatically when the penalty condition is removed.**
Reporting Non-Operator Problems

- A RCL/OCU Malfunction Reporting must be completed when the operator (RCO) encounters a malfunction of any part of the RCLS during operation of the RCLS equipment.
- Space has been added to the daily locomotive inspection form for this purpose.
- For any inspections reporting defects, a copy of the completed form must be submitted no later than the end of shift to the local manager, and manager or dispatcher must be verbally notified of the problem prior to end of shift.
Securing Equipment

Remote control locomotives (RCL) and Operator Control Units (OCU) must not be left unattended unless secured or disabled.
Securing Equipment

- To secure an unattended, operating, RCL, follow these steps:
  - Set throttle to idle
  - Fully apply brakes
  - Set hand brake
  - Switch OCU to OFF
  - Remove battery from OCU
Securing Equipment

- When ending tour of duty, the Remote Control operator (RCO) must place the locomotive in the manual mode unless being relieved by another RCO.
  - Throw power ON/OFF switch on LCU of OFF--This applies emergency brakes.
  - Turn the MU-2A valve to the “LEAD or DEAD” position and apply the Independent brakes.
  - Set automatic brake valve to RELEASE position.
  - Set automatic brake valve cutoff valve to IN position.
  - Turn off the lights.
  - Apply sufficient handbrakes.
  - Set the isolation switch to the START/STOP/ISOLATE position.
  - Set Generator Field switch to OFF.
  - Remove the red “Remote Control” tag from control stand and attach to your OCU for future use.
Remote Control Zones

- Designated by Special Instructions, General Order
  - Signs are also posted
- May also be designated or activated by issuance of Form C Track Bulletin
  - Issued to all potential users of the track segment designated.
Remote Control Zones

- The RCO-EIC in control of a Remote Control locomotive must be notified of any track removed from service or working limits established for the protection of another craft.
- Job briefings as appropriate
Remote Control Zones

- Before a train, engine, or other men/equipment enter a Remote Control area (RCZ), a crewmember must communicate with the supervisor in charge of the RCZ, or with the RCLS-EIC
Remote Control Zones

- Activating the Remote Control Zone (RCZ):
  - Only the RCO-EIC may activate a Remote Control zone.
  - Remote Control zone limits do not include tracks within CTC or interlocking limits (CTC or interlocking rules apply).
- The RCO-EIC must notify the dispatcher or designated person when activating the RCZ.
- An activated RCZ is under the jurisdiction of the RCO-EIC.
Remote Control Zones

- When a Remote Control zone is activated, the Remote Control operator is relieved of point protection for pullout movements (locomotive on leading end) only.

- **Rule 6.28 requirement to stop within one-half the range of vision is suspended for the RCL crew only.**

- After the Remote Control zone is activated, the RCO-EIC must ascertain that switches/derails are properly lined and track(s) within the zone are clear of trains, engines, railroad cars and men or equipment fouling track before initial pullout movement.

- This process must be repeated each time the Remote Control zone is activated.
Remote Control Zones

- A RCL crew going off duty may turn the RCZ over to the relieving RCL crew provided the relieving RCO-EIC notifies the dispatcher or other designated person of the change.

- Prior to operating an RCL in an activated RCZ; the relieving crew must conduct a job briefing with the RCL crew going off duty.
Remote Control Zones

- When the RCZ is vacated and no longer needed by that crew or an immediate relief crew, the RCO-EIC must deactivate the RCZ by promptly notifying the dispatcher or other designated person.

- The RCZ may remain active by General Order or Timetable special instruction if such document specifies the hours and days that the RCZ is active.
ENTERING/USING REMOTE CONTROL ZONES

Before entering a Remote Control zone, all employees that are not part of the Remote Control crew must determine whether the zone is activated.

Employees may receive this information from:

- the RCO-EIC, or
- the supervisor in charge of yard movements, or
- the operations coordinator or
- other designated employee
ENTERING/USING REMOTE CONTROL ZONES

- When the Remote Control zone is activated, track(s) within the zone must not be fouled, occupied, or switches operated:
  - Until the Remote Control zone has been deactivated or
  - Authority is granted by the RCO-EIC to enter the Remote Control zone.

- The RCL crew must fully comply with Rule 6.28 (unmodified) while other employees are in the Remote Control zone.

- The RCO-EIC must ensure the track is clear and switches are properly lined after other employees are clear of the RCZ.
ENTERING/USING REMOTE CONTROL ZONES

- Maintenance of Way and Maintenance of Equipment employees and contractors must receive permission from the RCO-EIC before occupying or fouling any track within or adjacent to the activated RCZ.

- Permission must be repeated and acknowledged.
ENTERING/USING REMOTE CONTROL ZONES

- Upon receiving permission to work within or foul the RCZ, M of W and M of E personnel must display red flags (or blue flags, as applicable to craft) and lock out tracks against movement into them.

- RCO-EIC must be advised of the location of all flags and which switches have been lined.

- After all men and equipment are clear, all flags are removed and switches returned to the proper position, the employee in charge of the work crew must notify the RCO-EIC.
ENTERING/USING REMOTE CONTROL ZONES

- Train or engine crews must receive permission from the RCO-EIC before occupying or fouling any track within an activated RCZ. Permission must be repeated and acknowledged.

- Upon receiving permission to enter the RCZ the train or engine crew must comply with instructions from the RCO-EIC in charge of the RCZ.
ENTERING/USING REMOTE CONTROL ZONES

- A job briefing among all members of the RCL crew must be held any time other employees are granted permission to occupy the activated RCZ.

- A supervisor or dispatcher may relay instructions from the RCO-EIC to employees requesting permission to enter an activated RCZ.
ENTERING/USING REMOTE CONTROL ZONES

- When permission is granted to other employees to occupy an activated RCZ, the RCL crew is responsible for providing protection against such employees.
- At specified RCZ crossings, employee foot traffic and off-track vehicles may cross the RCZ without permission from the RCO-EIC.
- Employees crossing the RCZ must be alert for movement of equipment at any time in either direction. Such crossings will be designated by a sign reading:
  
  "REMOTE CONTROL ZONE
  STOP
  PROCEED WITH CAUTION"
PERIODIC INSPECTION OF THE RCLS

Checks must be performed and noted on the daily inspection form:

- Check the QC boxes and mounting brackets for obvious cracks or dents in the metal cases.
- Check the external connectors on the QC boxes for signs of unusual wear and tear.
- Check all MU hoses and cables used to connect the QC boxes for unusual wear and tear, especially at the ends of each hose.
- Check the operation of the locomotive strobe light used as a visual indication that the locomotive is in remote operation.
RCLS Inspection
PERIODIC INSPECTION OF THE RCLS

- If any part of the locomotive RCLS equipment is found to be defective, it must be repaired immediately or the locomotive must not be used in remote operation.

- The LCU is checked at the beginning of each tour of duty. If defective, it must not be used and must be turned in for immediate shipment to Cattron for repairs.
PERIODIC INSPECTION OF THE RCLS

☐ OCU Batteries:

- **Nickel-Cadmium (Ni-Cad) Battery Pack** provides approximately 23 hours of continuous OCU operation. This battery pack is **re-chargeable** using the CATTRON-THEIMEG™ 70C-0004 Battery Conditioner.

- It requires 3 hours to fully charge and each battery is good for over 200 cycles of use.
PERIODIC INSPECTION OF THE RCLS—OCU Battery Replacement--1

☐ When the OCU’s ‘TRANSMIT/LOW BATTERY’ LED starts flashing red, the battery has approximately one hour of continuous operation remaining

☐ Battery pack must be replaced or re-charged before time expires
1. Set the OCU’s Power ON/OFF switch to the ‘OFF’ position.
2. Referring to the diagram, unlock the battery door by inserting a coin into the slot and twisting.
3. Open the battery door and lift the battery pack out of the tray.
4. Install a fresh, fully charged battery pack in the OCU, making sure the contacts on the underside of the battery pack locate with their corresponding pick-up contacts in the battery tray.
5. Close the battery door and secure by pressing firmly until it snaps into the locked position.

6. Set the OCU’s Power ON/OFF switch to ‘ON’.

- Observe that the ‘TRANSMIT/LOW BATTERY’ LED momentarily flashes yellow and two quick beeps are heard.
- When resuming your remote control operation, observe the ‘TRANSMIT/LOW BATTERY’ LED as you operate a non-motion function toggle switch such as a horn or bell.
- If this LED is now flashing green, your OCU is fully operational.
PERIODIC INSPECTION OF THE RCLS—OCU Battery Replacement
PERIODIC INSPECTION OF THE RCLS—OCU Battery Replacement

- The CATTRON-THEIMEG™ Battery Conditioner (Charger) incorporates an LED that indicates status as follows:
  - **Amber Color** – indicates the battery pack is being discharged.
  - **Red Color** - indicates the battery pack is being charged at a rapid rate.
  - **Green Color** - indicates the battery pack is fully charged and that a ‘trickle’ charge is being applied to maintain the fully charged state.
Radio Frequency Operation

- If the RCO suspects that there is a radio frequency problem, it must be reported at once. The OCU and the matching LCU have been color coded or numbered to prevent accidental misuse.
- Do not attempt to alter the radio frequency of any OCU or LCU without the permission of a manager or other designated person.
- Radio frequencies operate on a line of sight string. If the RCO cannot see the locomotive, it is possible that the RCL will not receive commands from the OCU. When in doubt, stop the movement, and adjust position.
- Each LCU is equipped with an Automatic Safety Override (ASO) feature that monitors STOP commands and fault conditions and will disconnect the RCL’s generator field and set the independent brake when triggered.
Job Briefing 1

- Initiate a job briefing prior to any work to ensure complete understanding of all concerned who will be performing the specific task.
- Review the task to be accomplished as well as location and characteristics of the work area.
- Divide the task into step-by-step procedures addressing existing and potential hazards of each task and list precautionary measures that are to be implemented.
- Identify tool, equipment, and material requirements.
- Explain the task to the employees when conducting job briefings.
- What, Why, When, Where, How, Who, and any special considerations pertaining to the task.
Job Briefing 2

- Consider existing / potential hazards (not all inclusive):
  - weather conditions; tools, equipment and materials to be used; train, vehicular and pedestrian traffic; slip/trip/falls
- If the task is more complex than routinely performed, advise the employees and brief only a portion of the job. Give additional briefings as the job progresses.
- Ensure complete understanding of the task, clearly define work assignments, and other requirements at hand by obtaining an acknowledgment from each employee.
- Conduct additional briefings as necessary due to change in plans, protection afforded, or workplace conditions.

- **Examples of Changes:**
  - changes in personnel
  - changes in weather conditions
  - assignment changes
  - changes of equipment