# CANAC REMOTE CONTROL LOCOMOTIVE SYSTEM

## RCLS Operation -CANAC

### Special Instructions for the use of Canac Remote Control Locomotive System (RCLS)

**1.0 General**

**1.1** All CROR, GOI and Timetable Special Instructions remain in effect, except as modified herein.

**1.2** In the application of CROR Operating Rules Notes: (vi) & (viii) the employee performing the duties of a:

- locomotive engineer, the duties will be performed by the YSE (Yard Service Employee)
- conductor, the duties will be performed by the YSH (Yard Service Helper)

**Note: UYE (Utility Yard Employee) will perform the duties of either the YSE or the YSH when relieving these positions**.

**1.3** It is prohibited to attempt a "running switch" (drop) using RCLS equipment.

**1.4** YSE and YSH must pay careful attention to the approximate number of cars being handled in relation to loads and empties in order to ensure proper train handling practices can be followed.

**1.5 Strobe Lights:**

Some RCLS Locomotives are equipped with strobe lights. If so, the following instructions are to be complied with. (This item does not apply to locomotives that are not equipped with the strobes.)

When operating in Remote mode, there are strobe lights located on each side of the locomotive which will flash RED to indicate remote operation. These lights are for operator reference only and do not affect the operation of RCLS equipment. The following instructions govern when strobe light(s) become defective:

- both strobe lights must be operative when taking charge of RCLS equipment at a Locomotive Safety Inspection Location.
- at least one strobe light must be operative when taking charge of RCLS equipment at other than a Locomotive Safety Inspection Location.
- If a strobe light fails, report to your immediate supervisor or locomotive facility so repairs can be arranged. It is permissible to continue working with one strobe light with no restrictions.
- If both strobe lights fail, it is permissible to continue working providing that a crew member is positioned on the leading end of the working consist whenever that consist is in motion.

**1.6** Except when required to stop before coupling, all movements must be slowed to approximately 1 mph with speed selector in COUPLE position when between 6 and 12 feet from equipment to be coupled to, and moved to STOP just prior to coupling.

**1.7 In the application of GOI Section 7, item 15.1, when coupling cars:**

- Do not attempt to couple a car or locomotive to another piece of equipment, unless the couplers are in line with each other.
- When it becomes necessary to adjust a mismatched coupler, the following procedure must be used:

a) Stop the movement.

b) Allow a safe distance, not less than 50 feet, for working room between equipment (whenever necessary, the controlling OCU operator should reverse the movement and stop a second time to obtain a safe amount of room).

c) Wait for the movement to come to a complete stop and for the slack to adjust and settle (do not overlook unexpected movements resulting from liquids sloshing in tank cars).

Before fouling the track or making a movement between equipment to adjust knuckles, drawbars, couple brake pipe hoses or operate angle cocks, establish three point self-protection as follows:

i) The operator requiring protection **MUST** have control (unless protection provided as per 1.7(d) below)
ii) Speed selector at **STOP** position
iii) Reverser at NEUTRAL position

**NOTE:** Train brake setting may be applied as per operational requirements at the discretion of the controlling operator while providing self-protection.

d) When a controlling operator is providing protection for another person for any reason, three point protection **MUST** be applied as follows and then communicated to the person(s) requesting protection:

i) Speed selector at STOP position
ii) Reverser at NEUTRAL position
iii) Train Brake setting at FULL position

**1.8** When coupling together two portions of a train charged with air, unless the locomotive brakes are sufficient to prevent movement, the train brake selector must be toggled to FULL position and sufficient hand brakes applied to prevent movement before opening the angle cock.

**1.9** Verbal communication between crew members relating to the nature of RCLS operation and a thorough understanding of all movements and intentions must be maintained at all times.

**1.10** Immediately after commanding direction and speed, the controlling employee must visually verify that the movement is responding in the requested direction.

**1.11** RCLS employees are responsible to ensure that they are familiar with current information regarding the remote control systems and locomotives.

**1.12** Whenever there is doubt that locomotive brakes can control and stop the movement, then sufficient air brakes must be cut-in and tested to ensure adequate braking ability exists.

**The following status messages will indicate an insufficient state of charge and will not allow the movement to proceed**:

- "Brake charging in progress"
- "Brake recovery in progress"
- "Aborted brake recovery"
- "Low brake pipe pressure"
- "Low main reservoir pressure"
- "Brake cylinder pressure fault"

**Whenever state of charge is in doubt, stop the movement and recharge equipment.**

**1.13** Brakes must be kept free of ice and snow in winter conditions by doing the following:

- condition brake shoes periodically on locomotives by requesting a slower speed;

OR

- on cars charged with air, toggle the train brake selector to MIN position (at speeds of 4 mph or less).

**Note:** Some RCLS locomotives are equipped with a "Snow Shoe Brake" which will provide 6-7 psi brake cylinder pressure on the locomotive under winter conditions. Additional brake shoe conditioning for the locomotives and cars may be required in severe conditions.

## 2.0 Taking Charge of RCLS Equipment at Any Location

These instructions apply when taking charge of an RCLS consist left in Remote Mode or when initially setting up from manual to Remote. These instructions do not include direct transfer between crews or employees.

**Note:** All trailing locomotives must have air brakes set up for trail as per GOI Section 15, item 15.1.

**2.1 Initial Checks.**

| Step | Action |
|---|---|
| 1 | Apply hand brake |
| 2 | Check that flagging kit is fully supplied on RCLS locomotive. |

### 2.2 Start Engine Manually (if required as per GOI Section. 15, item 17.0 and 18.0)

**Smart-Start**

| Step | Action |
|---|---|
| 1 | Ensure hand brakes are applies as per item 2.1. |
| 2 | Ensure **Smart-Start** is activated throughout consist (as indicated by green light on electrical panel in each locomotive. **Note:** A dead locomotive with a red Smart-Start light must be started manually. |
| 3 | In locomotive set up as lead (air brakes are cut IN), depress Safety foot pedal (if equipped) and move independent brake handle to RELEASE position. |
| 4 | If locomotive RSC system activates (lights flash and tone sounds), depress yellow reset button on control stand. |
| 5 | After engine starts, move independent brake handle to fully applied position and release Safety foot pedal (if equipped). |

**Note:** Smart-Start will work with isolation switch in either RUN or ISOLATE position.

### 2.3 Perform Locomotive Inspection.

| Step | Action |
|---|---|
| 1 | Drain moisture from main reservoirs |
| 2 | Check fuel tank for fuel level and report if low |
| 3 | Check for two blue bull's eyes on the RCLS air dryer and report to supervisor if other than blue |
| 4 | Check that MU hoses, cocks, and 27 pin electrical cable are in place and properly connected (if operating multiple unit consist) |
| 5 | Inspect running gear, brake system, pilots, knuckles and pins, for any visible damage |
| 6 | Inspect for any other apparent hazards likely to cause an accident; report any exceptions, and record this information on the crew to crew form |

### 2.4 Set Up Control Stand (if necessary)

| Step | Action |
|---|---|
| 1 | Set front and back headlight to dim |
| 2 | Ensure throttle is in IDLE, reverser is centred with handle removed |
| 3 | Ensure GF switch is OFF, engine run and control/fuel pump switches are ON.<br>**Note:** All 3 switches must be OFF in trailing locomotives unless otherwise provided |
| 4 | Place automatic brake to FULL SERVICE position and allow exhaust to quit blowing |
| 5 | Cut out the automatic brake valve and move handle to HANDLE OFF position |
| 6 | Ensure independent brake handle is FULLY APPLIED |
| 7 | Place MU-2A valve in TRAIL position |

### 2.5 Set Up Electrical Control Panel (if necessary)

| Step | Action |
|---|---|
| 1 | Ensure front and rear number light switches are ON (RCLS unit only) |
| 2 | Set headlight control as per label |
| 3 | Report traction motors if cut-out; (no restrictions apply). |
| 4 | Ensure start/stop/isolate switch is in ISOLATE |

### 2.6 Set up Electrical Cabinet (if necessary)

| Step | Action |
|---|---|
| 1 | Ensure battery knife switch is fully CLOSED |
| 2 | Ensure all circuit breakers in the black area are ON |
| 3 | Ensure LCS and LCS AUX breakers are ON |
| 4 | Ensure headlight circuit breaker is ON |
| 5 | Turn radio circuit breaker ON and ensure locomotive radio has power |

**Note: The radio breaker must be OFF when manually starting engine**.

**2.7 Set up Short Hood Equipment (if necessary)**

| Step | Action |
|---|---|
| **1** | Set selector switch to A / B |

**2.8 Set up RCLS Changeover (if necessary)**

| Step | Action |
|---|---|
| **1** | Place changeover switch on electrical panel to BELTPACK |
| **2** | Press 'Attention' button and ensure RCLS indicator light is illuminated |
| **3** | Observe if strobe lights are working |
| **4** | Place isolation switch in RUN position |

**2.9 Power up OCUs**

| Step | Action |
|---|---|
| **1** | Obtain OCUs. |
| **2** | Insert batteries. |
| **3** | Program OCU (if necessary) |
| **4** | Turn OCUs ON |
| **5** | Wait (approximately 60 seconds) for the OCU self diagnostic check to finish |
| **6** | Press STATUS button on OCU and perform recovery as requested by the message |

**2.10 Programming Version 2 OCUs**

| Step | Action |
|---|---|
| **1** | Turn the OCU OFF |
| **2** | Push the F1 or F2 radio frequency button on the OPP to pick the radio frequency you require |
| **3** | Push A or B letter button on the OPP to designate which OCU letter you require |
| **4** | Line up the infrared eye on the OPP with the infrared eye on the OCU and turn the OCU ON |
| **5** | Verity assignment read out on OCU alphanumeric display. |

**Note: If the screen shows "FAILED", repeat procedure. When screen displays "OK" it will also display the programmed features including locomotive number, OCU letter and radio frequency.**

**2.11 Perform the following Required Tests:**

1. Status test (both OCUs)
2. RSC test (both OCUs)
3. Tilt test (both OCUs)
4. Miscellaneous tests (both OCUs)
5. Locomotive/OCU brake test (controlling OCU)

## 3.0 RCLS Tests

**Note: Prior to performing any of the following tests ensure that the equipment is properly secured to prevent movement**.

**3.1 Status Test** (to ensure proper communication between OCU and locomotive)

| Step | Action |
|---|---|
| **1** | Press STATUS button on both OCUs. |
| **2** | Ensure operators receive talker message on portable radios |

**Note: If talker message is not heard on one or both portable radios, ensure that locomotive and portable radios are turned on, on the same channel and that selector switch is A&B and repeat test.**

**3.2 RSC Test (to ensure Reset Safety Control feature is functioning)**

| Step | Action |
|---|---|
| **1** | Ensure reverser is In NEUTRAL |
| **2** | Press RSC and place speed selector in COAST |
| **3** | Ensure locomotive(s) rev up |
| **4** | Ensure pulsing alarm sounds after 50 seconds |
| **5** | After 10 more seconds, verify locomotive(s) return to IDLE and brake pipe pressure drops as indicated on locomotive gauge. **Note:** BP pressure must drop at least 25 psi |
| **6** | Recover train brake from beltpack |
| **7** | Verify recovery message |

**3.3 Tilt Test (to ensure tilt feature is functioning)**

| Step | Action |
|---|---|
| **1** | Ensure reverser is in NEUTRAL |
| **2** | Press RSC and place speed selector in COAST |
| **3** | Ensure locomotive(s) rev up |
| **4** | Tilt RCLS more than 45 degrees and shake |
| **5** | Verify continuous tone alarm sounds then upright RCLS |
| **6** | Press Tilt Time-out button, (until double beeping alarm sounds with version 2 |
| **7** | Tilt RCLS over 45 degrees to verify tilt feature is bypassed<br>• Wait 20 seconds, then press RSC (except on "version 2" RCLSs).<br>• Ensure that tilt alarm re-activates after 60 seconds<br>Verify locomotive(s) return to IDLE and that emergency brakes have applied as indicated on the locomotive gauge |

**3.4 Miscellaneous Tests**

| Step | Action |
|---|---|
| **1** | Check that the bell and whistle are working from OCU |
| **2** | Check that headlights are operating properly from OCU |

### 3.5 Locomotive/OCU Air Brake Test

**Note: This test is required after RCLS locomotive has been initially set up from manual to Remote, when status message indicates System Reset, when taking charge of RCLS equipment or when adding a locomotive to the consist.**

| Step | Action |
|---|---|
| 1 | Ensure handbrakes are released - locomotive will move while performing this test |
| 2 | Ensure train brake selector has been in RELEASE for at least 2 minutes |
| 3 | Take up a position on the ground to observe the brake cylinders during the test |
| 4 | Set reverser switch to FORWARD or REVERSE |
| 5 | Press RSC, move speed selector to COUPLE within 3 seconds |
| 6 | Ensure locomotive(s) begins moving in selected direction and all brakes release |
| 7 | Set brake override to LOW and ensure brakes apply |
| 8 | Set brake override to RELEASE and ensure brakes release |
| 9 | Toggle train brake selector to MIN position and ensure brakes remain released |
| 10 | Toggle train brake selector to FULL position and ensure brakes apply and locomotive consist stops. |
| 11 | Place speed selector in STOP |
| 12 | Toggle train brake selector to RELEASE |
| 13 | Listen for the unsolicited “Brake Recovery Complete” message |

**Note: When the “snow brake” feature is active on the RCLS locomotive, the brake cylinder pistons will not retract during brake tests, but the brake cylinder gauge will display the rise and fall of brake cylinder pressure. In this case, a member of the crew must be in position in the locomotive cab to observe the gauges during the test.**

### 3.6 Running Brake Test

| Step | Action |
|---|---|
| 1 | Release hand brakes |
| 2 | Set reverser switch in FORWARD or REVERSE |
| 3 | Press RSC, move speed selector to 4 MPH within 3 seconds |
| 4 | Set brake override selector to LOW. Verify that brakes apply with sufficient force to indicate they are operating properly. |
| 5 | Move brake override selector to RELEASE |

**Note: If brakes do not operate correctly, stop IMMEDIATELY. Check equipment set-up and perform a Locomotive/OCU brake test as per Item 3.5.**

## 4.0 Resuming RCLS Operations

**4.1** After direct transfer of OCU to relieving employee or whenever an OCU has been turned off.

**Note: Direct transfer is defined as when an OCU is handed directly to the relieving employee**.

Secure equipment, if necessary, to prevent unintended movement.

**Resuming Operations**

| Step | Action |
|---|---|
| 1 | Turn ON OCU(s), wait for self diagnostic test to complete, approximately 60 seconds (if OCUs have been turned off |
| 2 | Recover train brake from beltpack as per recovery message (if OCUs were required to be turned on |
| 3 | Perform status test |
| 4 | Ensure OCU reverser is in NEUTRAL |
| 5 | Perform tilt test to first audible alarm only |
| 6 | Perform RSC test to audible alarm only. Move speed selector to STOP position. |
| 7 | Perform a running brake test as per item 3.6 above |

### 4.2 After Replacing a Defective OCU

| Step | Action |
|---|---|
| 1 | Replace defective OCU, put batteries in, power on and wait for self diagnosis test to complete, approximately 60 sec. |
| 2 | Program OCU (if necessary) as per Item 2.10, and perform tests as per Items 3.1 to 3.4 on replacement OCU |

## 5.0 Recovery Procedures

**Note:** If RCLS encounters any problems, it will stop the movement with one of 3 penalty brake applications.

| Penalty Name | Resulting Brake Application |
|---|---|
| **1.** Service Brake | Full independent brake application on locomotive(s) |
| **2.** Train Brake | Full independent brake application plus full train brake application. |
| **3.** Emergency Brake | Full independent brake application plus a sudden reduction on the brake pipe to zero psi. |

**Note: Whenever an emergency application of the brakes occurs while moving, a crew member must perform a pull-by inspection of equipment being handled.**

### 5.1 Recover emergency, train brake or service from consist.

| Step | Action |
|---|---|
| 1 | Identify and correct any problems on the locomotive(s |
| 2 | Press the RCLS ATT'N button in the cab of RCLS locomotive |
| 3 | Press STATUS button and follow recovery instructions. |

### 5.2 Recover Emergency From Beltpack

| Step | Action |
|---|---|
| 1 | Move speed selector to STOP |
| 2 | Ensure train brake selector is toggled to RELEASE |
| 3 | Move brake override selector to ES position |
| 4 | Press RSC button and, within 3 seconds |
| 5 | Move brake override selector to RELEASE position |
| 6 | Ensure unsolicited "Brake Recovery Complete" message is received |

### 5.3 Recover Train Brake From Beltpack

| Step | Action |
|---|---|
| 1 | Move speed selector to STOP |
| 2 | Toggle train brake selector to FULL position |
| 3 | Press RSC button and, within 3 seconds |
| 4 | Toggle train brake selector to RELEASE position |
| 5 | Ensure unsolicited "Brake Recovery Complete" message is received. |

### 5.4 Recover Service From Beltpack

| Step | Action |
|---|---|
| 1 | Move speed selector to STOP |

**Note: Status message will still indicate "Recover Service From Beltpack" until consist has accepted a subsequent movement command.**

### 5.5 Release Train Brake From Beltpack

| Step | Action |
|---|---|
| 1 | Move speed selector to STOP |
| 2 | Toggle train brake selector to RELEASE position |
| 3 | Ensure unsolicited "Brake Recovery Complete" message is received |

## 6.0 Pitch and Catch - transferring operator control

| Step | Action |
|---|---|
| 1 | Movement must be stopped |
| 2 | Set both OCU speed selectors to STOP |
| 3 | Ensure both OCU Train Brake controls are at identical settings |
| 4 | Controlling operator presses PITCH button |
| 5 | Within 10 seconds, receiving operator presses RSC button |
| 6 | Status button may be pressed to confirm successful pitch. |

**Note:** If transfer fails, repeat procedure.

## 7.0 Single OCU Operation

| Step | Action |
|---|---|
| 1 | Place brake override selector in EMERGENCY position prior to entering nose of locomotive |
| 2 | Place RCLS selector switch on MCU in nose of locomotive to the operative OCU letter (A or B) |
| 3 | Press RCLS ATT'N button |
| 4 | Press Status button on operative OCU and follow indicated recovery procedure. |

**Note:** If an OCU becomes inoperative during a shift (e.g. dead battery with no replacement), it is permissible to continue to work, but only to:

- Clear a main track or lead
- Clear public crossings at grade or cut the train as required.
- Move the locomotive(s) to a designated track.
- Complete spot (if no switching involved) as long as controlling OCU operator is at spot location.

## 8.0 Transfer Movement

**Note:** All RCLS transfer movements require a brake test.

### 8.1 Initial Charging

| Step | Action |
|---|---|
| 1 | Couple onto cars and test coupling |
| 2 | If locomotive brakes are not sufficient to prevent movement, ensure sufficient handbrakes are applied to cars |
| 3 | Set reverser selector to NEUTRAL |
| 4 | Toggle train brake selector to CHARGE position |
| 5 | Ensure (a) all air hoses are coupled, (b) angle cocks are open from consist throughout cars to be put on air and (c) that last angle cock is closed |
| 6 | Toggle train brake selector to RELEASE position |
| 7 | Listen for unsolicited "Brake Recovery complete" message |

### 8.2 Brake Test

| Step | Action |
|---|---|
| 1 | Ensure last car has had the air cut in for at least 5 minutes since receiving Brake Recovery Complete message. |
| 2 | Toggle the train brake selector to FULL position |
| 3 | Ensure that brakes apply on the last car with air cut in. |
| 4 | Toggle the train brake selector to RELEASE position |
| 5 | Ensure that brakes release on last car and listen for unsolicited "Brake Recovery Complete" message. |
| 6 | RCLS transfer movements must also be governed by GOI Sec. 13, Item 15.3. |

## 9.0 Leaving Locomotive Unattended (with or without cars)

### 9.1 Leaving a locomotive unattended in Remote Mode

| Step | Action |
|---|---|
| **1** | Apply sufficient handbrakes on cars and test their effectiveness as per GOI Section 14, item 1.2 |
| **2** | Apply handbrakes on all locomotives in the consist and test their effectiveness as follows<br>• select a direction<br>•. press RSC<br>•. speed selector to COUPLE<br>•. ensure locomotive brakes release<br>•. speed selector to COAST<br>•. verify locomotive stops<br>•. speed selector to STOP |
| **3** | Turn OFF headlight circuit breaker |
| **4** | Turn OFF both OCUs. |

**Note: OCUs must remain in the possession of employees responsible or otherwise secured**.

### 9.2 Leaving Locomotive Unattended in Conventional Mode

| Step | Action |
|---|---|
| **1** | Set both OCU speed selectors to STOP. |
| **2** | Apply and test handbrakes as per Item 9.1 |
| **3** | Turn OFF both OCUs |
| **4** | Place isolation switch in STOP/START/ISOLATE position |
| **5** | Set RCLS changeover switch to MANUAL. |
| **6** | Turn radio and headlight breakers OFF. |
| **7** | Ensure independent brake is fully applied |
| **8** | Place the MU-2A valve to LEAD position |
| **9** | Turn Automatic Brake Valve cut-out to IN position |
| **10** | Move automatic brake valve handle to EMERGENCY position, wait 1 minute |
| **11** | Move automatic brake valve handle to HANDLE OFF position and ensure PCS light goes out. If not, return handle to EMERGENCY, wait and repeat step |
| **12** | Move handle to RELEASE and ensure brake pipe pressure rises |
| **13** | Turn OFF all lights, close windows and doors |

## 10.0 Multiple Unit Setup

### 10.1 Coupling RCLS Consist to Another Locomotive

| Step | Action |
|---|---|
| **1** | Couple on to locomotive(s) and stretch to ensure coupling. |
| **2** | Connect 27-pin electrical trainline cable between locomotives and secure |
| **3** | Couple brake pipe, open angle cocks, couple 3 MU pipes and open cut-out cocks |
| **4** | On trailing locomotives<br>• Ensure throttle is in IDLE and reverser handle is removed<br>• Ensure GF switch, engine run and control/fuel pump switches are OFF<br>• Cut-out the automatic brake valve and move handle to HANDLE OFF position.<br>• Ensure independent brake handle is fully applied<br>• Place MU-2A valve in TRAIL position<br>• Ensure headlight control switches on all locomotives are properly set if additional locomotives are to form part of RCLS consist for working purpose |
| **5** | Perform a locomotive/RCLS air brake test |

**Note: If the locomotive that is being coupled to is Smart Start equipped, unless otherwise directed, Smart Start must be deactivated by mechanical personnel before 27-Pin electrical trainline cable is connected.**

## 11.0 Removal of OCU for Specific Tasks

**NOTE:** These instructions apply only when protection from your own movement is required

### 11.1 Before Removing OCU

| Step | Action |
|---|---|
| **1** | Locomotive must be stopped |
| **2** | Confirm intent to remove OCU with other crew members |
| **3** | Control must be transferred to operator removing the OCU |
| **4** | Apply 3-point protection as per Item 1.7(c). |

**Note: After removing OCU, it must be placed in close proximity (to prevent tampering).**

### 11.2 Before Movement Commences.

| Step | Action |
|---|---|
| **1** | OCU must be re-attached to harness |
| **2** | Other crew members must be informed of intent to release train brake |
| **3** | Toggle train brake selector to RELEASE and wait for unsolicited recovery message. |

**Note: If both operators need to remove the OCU from their harnesses, the non-controlling operator need not take any special steps other than to confirm that 3-point protection has been applied by requesting a status message (status message will indicate "Release Train Brake from Beltpack) and a job briefing has been done with controlling OCU operator.**