II. PANEL INTERLOCKING:

1. Panel interlocking is a modern signalling system provided at the stations wherein both points and signals are operated from a centrally located panel by means of push buttons or knobs. This system essentially provides for relay interlocking and has augmented safety features because of consolidation of interlocking. The panel operations, apart from providing ease of operation also eliminates time loss and confusion which invariably occur when the operations of a number of agencies are to be coordinated when the operational work is delegated to a number of agencies. The status of the points, signals and the reception lines is readily available on hand to the Station Master, which makes for smoother operation.

1.1 The Principal of the Zonal Railway Training Institute / Moula-ali is responsible for the proper initial/refresher training of the staff in the rules connected with the operation of panels. After the staff are examined and certified fit, only then he shall grant the necessary Competency Certificate in respect of all the panels. Such certificate shall be valid for a period of three years from the date of issue.

2. Types of Panels: On South Central Railway, there are two types of panel interlocking systems:

    (a) Siemen's panel and [German system]

    (b) Podanur workshop panel [British system]

3. In any panel interlocking system first the points have to be operated and set individually to the desired route. Then only then the signal can be taken 'off'.

4. **SIEMEN'S PANEL:**

    (a) The station diagram is depicted on the panel board.

    (b) Push buttons of the different colour codes are provided near the points, signal etc., for their operations. Buttons for the other purposes such as cancellation etc., are also provided.

    The normal set up is as follows:

Sl. No.	Buttons	Colour	Code
1.	Signal buttons.	Red	GN
2.	Route buttons.	Grey	UN
3.	Point buttons.	Blue	WN
4.	Shunt signal buttons	Yellow	GN
5.	Common/group point button	Blue	WWN
6.	Emergency signal/button	Red	EGGN
7.	Emergency point release button (sealed)	Blue	EWN
8.	Emergency sub route release button sealed and provided with counter.	Blue with dot.	EUYN

Sl. No.	Buttons	Colour	Code
9.	Emergency full route release button provided with counter.	Grey	EUUYN
10.	Point failure alarm, suppression button.	Grey	WXYN
11.	Signal failure alarm, suppression button.	Grey	GXYN
12.	Power failure alarm button.	Grey	NXYN.

c) Operation-

   i) The buttons used, are of self restoring type and return to normal position on release. NCR' indication along with audible warning appears after a button is kept pressed for a prolonged period of 10 seconds or more. Normally, buttons are not required to be pressed for more than 3 seconds.

   ii) Operation of points-

       a. No function can be performed by pressing a single button. Two related buttons have to be pressed and released simultaneously for operating a given function.

       For example, point button W and common point button WWN have to be pressed and released for operation of a point from normal to reverse or vice versa.

       b. Point indication: Normal and reverse indications of points are displayed by strip indications at the concerned points, normal on the straight and reverse on the turnout. The indications flash whenever the points are under operation and become steady when they are correctly set and locked. f the points are not properly set, the indication continues to flash.

       c. 'Points locked' indication appears as white dot near the point when it is locked by the route after the signals are cleared. Points cannot be operated when the indication is available.

       d. When the points are occupied by a train, the respective strip indications assume red.

   iii) Operation of signals**:**

       a) Indication: Only two signal indications are available for each signal on the panel - *red* for 'on' aspect and *green* for 'off' aspect (yellow, double yellow or green), when a signal lamp indication is available on the panel to indicate the same.

       b) Operation:

           1. Ensure that the route is correctly set including the overlap as well as the isolation. All point indications are steady in the required position,

           2. Ensure that the relevant track circuits on the path including the route and the overlap are clear, and

           3. Press the concerned signal button 'GN' and the corresponding route button 'UN' simultaneously and release.

c) Route Indication:

1) When signal is cleared for a route - all track including overlap indications appear on the panel,

2) Point lock dot indication appears near the concerned point, and

3) The concerned signal indication will change from Red to Green and remain steady.

In case a turnout is to be negotiated, a vertical white slit indication is available on top of the signal indicating that the route indicator on the signal is also lit. A white dot below the signal will also appear when the route is locked.

iv) Automatic route release:

a) As the train passes the signal, the signal aspect goes to 'on' automatically;

b) The route release is automatic. As the train occupies each section of the route, track indication changes from White to Red. As the train clears each section of the route, the indication disappears, signifying release of the section and

c) The white point lock indication pertaining to that section also disappears, leaving the point indication 'normal' or 'reverse' as per the setting signifying that the points are free for operation.

v) Route Cancellation:

a) For cancelling signalled movement, or

b) For change of route already set.

The following steps are to be followed:

1) Ensure-train has not passed the signal,

2) Press the concerned signal button (GN) and the emergency signal button (EGGN) to replace signal to 'on' position,

3) Press 'GN' and 'EUUYN' buttons simultaneously till the white dot cancellation indication appears by the side of the relevant signals.

Then release the buttons and wait for the flashing cancellation indication to become steady after an interval of 2 minutes approximately, and

4) Now press 'GN' and 'EUUYN' buttons, keeping 'GN' pressed, release 'EUUYN' and press corresponding route button and observe the following:

a) All track indications disappear,

b) White dot cancellation indication disappears,

c) The reading of the numerical counter near 'EUUYN' button is advanced by one number, and

d) Now cancellation is complete. Record the reading of cancellation counter in the special register giving reasons.

vi) Emergency sub-route release:

If any particular sub-route has not got released automatically after the passage of a train for any reason, locking of the sub-route can be released as follows:

1) Ensure that the last preceding train has arrived completely and the portion of the track concerned is free from obstruction,

2) Give written memo to SI/ESM to unlock the emergency sub route cancellation button,

3) SI/ESM will break the seal and unlock the 'EUYN' button with his emergency key, and

4) ASM should press 'EUYN' button and point 'WN' of the concerned point on the failed sub-route. ASM should ensure the following:

a) The track indication in this sub-route disappears,

b) The reading of the numerical counter near 'EUYN' is advanced by one number; enter this reading in the special register giving correct reasons,

c) Entry made in the prescribed register should be signed by Station Master and SI/ESM for each cancellation operation, and

d) The SI/ESM should seal the cancellation button before leaving the panel

(In some panels, 'EUYN' button is housed inside the panel to which ASM has no access).

vii) Point position Indication showing RED:

(a) Ensure Station Master's key is IN and turned to unlock the panel,

(b) Verify the point track indication for occupation,

(c) If it is clear, call for ESM to attend the track failure, and

(d) If the particular point is required to be operated under conditions on track circuit failure, operate the point button 'WN' with 'EWN' button.

5. **PODANUR WORKSHOP PANEL:**

a) The station diagram is depicted on the panel along with the relevant points/signals/track indications.

b) Knobs of different colour codes are provided on the panel below the diagram for operating the points and signals. The numbers of points/signals are painted on the corresponding knobs for easy identification. Buttons for other purposes such as cancellation etc., are also provided. The set up is normally as follows.

1) Signal knobs – Red (Two positions or three positions i.e., N and R or RCS)

2) Point knobs – Black (Two positions – N and R)

3) Shunt signal – Yellow (Two positions – N and R)

4) Siding signal – White (Two positions – N and R)

5) Emergency route cancellation button with counter – Grey

6) Power failure button – Grey.

c) Operation: The points and signals are operated by turning the knob switches to the required position.

i) Point indication: Three indications are provided on top of each point button viz., 'Green', when points are normal, 'Yellow' when points are reverse and 'White' in the middle of the two, when the points are free for operation. 'Green' and 'Yellow' indications flash during operations or when the points are not correctly set / locked.

ii) Signal indication: The signal indications repeated on the panel are as per the signal in the field i.e., 'Red' for the 'on' aspect, 'Yellow' for the 'caution' aspect and 'Green' for the 'Proceed' aspect.