

Director of S & T Engineering  
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## REMOTE CONTROL STANDBY ARRANGEMENTS

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### METHODS

When a time division multiplex (TDM) system is used to transmit panel controls and indications between the control centre and a remote interlocking then use of one of the following methods must be considered to provide a standby to maintain traffic movements should the TDM link fail:-

- (a) Provide alternative line wires for the TDM system carried in different cable routes with manual or automatic changeover facilities.
- (b) Provide duplicate TDM systems with automatic changeover facilities. Alternative line wires in different cable routes should also be utilised for each TDM system where these are available.
- (c) Provide override controls transmitted over individual line wires or via non-vital FDM systems which select nominated signal routes to operate automatically with alternative selection facilities where necessary. The extent and flexibility of the override controls provided to be agreed with and justified by, the relevant Operations Department.
- (d) The provision of local emergency panels is not considered to be a suitable standby arrangement. This does not preclude the provision of Local indication panels for maintenance purposes.

The choice of standby will depend on the circumstances in each case after due consideration of the reliability of the proposed TDM system; the relative reliability of the standby arrangements; the effect on traffic operations of a complete failure of the link with the remote interlocking; and the relative costs.

When the decision is for option (c), ie, override controls, then the following shall apply.

### REMOTE CONTROL OVERRIDE

#### 1. Main Switch

- 1.1 Control of each override facility to be effected by a 3 position (point key type) rotary switch labelled SIGNALS ON (left hand position), NORMAL (centre position) and AUTO (right hand position).

1. (Cont'd)

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1.2 An indication light shall be provided for each position of the override switch to prove that the respective relays at the remote interlocking have correctly responded (see also section 5.2).

2. REMOTE CONTROL FAILURE ALARM

2.1 A separate two position rotary switch shall be provided to silence the remote control failure alarm.

2.2 When operated this switch shall also extinguish all panel indication lights which are transmitted via the failed system and cause flashing lights to be illuminated to mark the extremities of the affected area on each line on the panel faceplate. Magenta track occupied lights shall be used for the flashing light indications.

2.3 Where separate control and indication systems are provided then separate fault indications are required for each system. In these circumstances the switch mentioned in item 2.2 refers to the indication system.

3. GOING INTO OVERRIDE

3.1 When going into the override mode ie, override switch operated from the NORMAL, to the AUTO position then the following conditions shall apply:-

3.2 Running signals required to work automatically in the override mode:-

If already "off" to remain "off" and operate in the automatic mode thereafter: if "on" to await the initiation of setting the "through" routes and thereafter to operate in the automatic mode.

3.3 All other main signals (including those selected for alternative routes) and subsidiary signals:-

Where comprehensive approach locking is provided for other reasons - if already "off" and a train has entered the approach locking area to remain "off" and the route to be then automatically cancelled by the passage of the train: if already "off" and there is no train within the approach locking area then the route to be restored normal. Where comprehensive approach locking is not provided for other reasons - if already "off" then the route to be restored to normal.

3.4 All shunting signal routes to be restored normal except when pre-set by a main route.

3.5 Each through route shall set when its interlocking is free, ie, points in the correct position or free to move and opposing locking free and the signal shall operate in the automatic mode thereafter. When the type of interlocking system requires that through routes should be set sequentially then the failure of one route to set shall not inhibit the setting of the remainder of the routes.

3. (Contd')

- 3.6 When emergency replacement of automatic signal controls are carried over the remote control system these shall be maintained in the normal (signal "off") mode.

4. ALTERNATIVE ROUTING

- 4.1 Where alternative routing is required the routes involved shall be selected by push/pull buttons, push to select the route(s) and pull to cancel the route(s).
- 4.2 An indication light shall flash to indicate that the selection has been initiated at the signalbox and this shall become a steady light when the route(s) concerned have been called. The route(s) set indication shall also be utilised at the control centre to inhibit the selection of any conflicting alternative route.
- 4.3 Selection shall be arranged to use the minimum number of buttons consistent with the essential operating requirements. Generally it should be possible to select more than one non-conflicting route on each button and once selected the routes shall operate in the automatic mode until cancelled manually.
- 4.4 Where exceptionally heavy traffic conditions require the use of one button for each alternative route then consideration may be given to making the selection effective for one train movement only with the route automatically cancelled by the passage of a train. Consideration may also be given in these circumstances to relaxing the conditions of section 4.2. to allow the pre-selection of conflicting routes providing that the pre-selection only becomes effective 5 seconds after the clearance of the conflicting route.
- 4.5 In all cases the button selection shall only be effective when the main override switch is in the AUTO position.

5. EMERGENCY REPLACEMENT OF SIGNALS

- 5.1 When the override switch is placed in the "SIGNALS ON" position this shall operate a latched relay at the remote interlocking which will replace all signals controlled over the remote control link to danger, including those automatic signals with individual emergency replacement buttons.
- 5.2 This replacement feature shall be proved by a weekly test procedure. To assist with this testing procedure the "SIGNALS ON" indicator mentioned in section 1.2 shall prove that the latched relay (section 5.1) has operated.
- 5.3 The "SIGNALS ON" condition shall be cancelled when the override switch is placed in the "NORMAL" OR "AUTO" position.

6. RESTORATION OF NORMAL WORKING

- 6.1 When the remote control system is healthy and normal working is to be resumed turning the two position switch (see section 2.1) back to the normal position shall illuminate the panel indications and extinguish the special flashing demarcation lights.
- 6.2 When the override switch is turned from "AUTO" to "NORMAL" all signals which are "off" shall remain "off" but the automatic working shall be cancelled. All functions will then operate from the normal panel buttons and switches.
- 6.3 When the remote control system carries "route set" rather than "button operated" information then the routes which have been set for override must be set using the panel buttons to synchronise the system before operating the override switch to restore normal working.

7. OPTIONAL OPERATING FEATURES

- 7.1 An indicator may be provided at the PSB to show that all points required in all through routes are correctly route locked and detected. Where alternative routes are provided the steady light specified in section 4.2 shall also prove that the points required by the alternative routes controlled by that button are correctly route locked and detected. This would allow hand signalling without clipping points if a local failure prevents one of the through signals clearing although all points in the route are locked and detected correctly.
- 7.2 Where local operating staff will be available consideration shall be given to providing an alternative means of getting into override when a complete loss of communication occurs. This shall take the form of a local override switch housed in a locked cabinet positioned according to local conditions. Emergency communication with the signalbox to be provided either by means of a B.T. telephone housed with the override switch or by using the National Radio Plan facilities.

8. OVERIDE TRANSMISSION SYSTEMS

- 8.1 Where possible the override circuits should not be carried in the same cable or cable route as the remote control system circuits. It is not intended that separate cables or cable routes should be provided solely for this purpose.
- 8.2 The override system need only be engineered to a non-vital specification.