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Module

Chapter C: Examples 3 & 4

For endorsement, authorisation and issue record of this document, please refer to the SSI Applications Manual Contents, NR/L2/SIG/17002.

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User information

This Network Rail standard contains colour-coding according to the following Red–Amber–Green classification.

Red requirements – No variations, could stop the railway

- **Red requirements shall** always be complied with and achieved.
- Red requirements shall be presented in a red box **with the word “shall” or expressed as a direct instruction**.
- Accountability for the efficacy of red requirements lies with the Professional Head/Standard Owner.
- Red requirements are monitored for compliance.
- Corrective actions shall be enforced if deviations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Amber requirements – Controlled variations, approved risk analysis and mitigation

- **Amber requirements shall** be complied with unless variation has been approved in advance.
- Amber requirements shall be presented with an amber sidebar **and with the word “shall” or expressed as a direct instruction**.
- Accountability for the efficacy of these requirements lies with the Professional Head/Standard Owner, or their nominated Delegated Authority.
- Amber requirements are monitored for compliance.
- Variations **may** be permitted. Variations are approved by the Standard Owner or through existing Delegated Authority arrangements.
- Corrective actions shall be enforced if **non-approved** variations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Green – Guidance

Guidance is based on good practice. Guidance represents supporting information to help achieve **Red** and **Amber** requirements.

Guidance shall be presented with a dotted green sidebar **and with the word “should” (usually in notes) or as a direct instruction**.

Guidance is **not mandatory** and is not monitored for compliance.

Alternative solutions may be used. Alternative solutions do not need to be formally approved.

Decisions made by a competent person to use alternative solutions should be backed up by appropriate evidence or documentation.

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Issue record

Issue	Date	Comments
5	April 2008	5 th Issue
6	03/03/2012	6 th Issue
7	05/09/2015	Section 1.2 & 2.3 amended to correct error

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 06/12/2015.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 3 (Option Selection) to continue to comply with the issue of any relevant Network Rail standards current when GRIP Stage 3 was completed and not to comply with requirements contained herein, unless stipulated otherwise in the scope of this standard.

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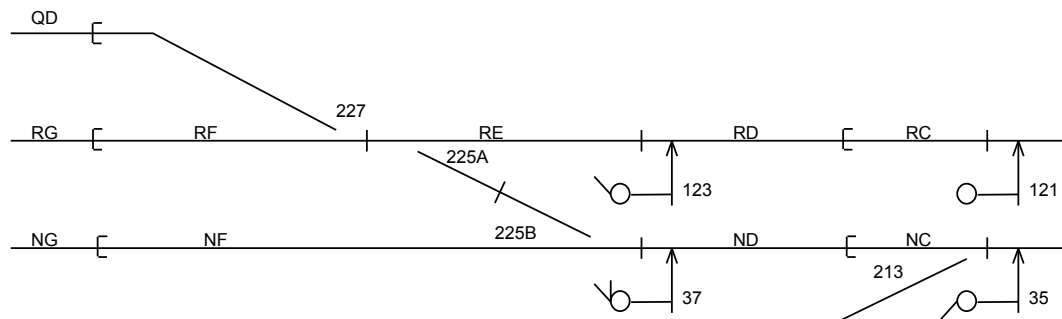
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1 Example 3

1.1 Track Layout and Control Tables

This layout has two facing connections in the overlap, one a crossover, and no separate trailing connections.



The Control Tables will require the following for points 225:

Locked by track circuits occupied: NF, RE

Set and locked normal by routes: 37A, 121 (as part of overlap), 123A, 123B

Set and locked reverse by routes: 37B, 37C

Route locking subsequently released by:

(NF clear, route 37A normal)

(NF, RE clear, routes 37B, 37C normal)

(RE clear, routes 123A, 123B normal)

[(RC, RD, RE clear or RD occ for 60 secs), route 121 normal]

Overlap locking on point setting after route 35B is set:

R -> N: Nil

N -> R: [RF clear #]

This overlap locking subsequently released by:

[route 35B normal,

(35B route locking released up to ND inclusive

or ND occ for 60 sec)]

There may be additional conditions here for points 227 in the data to cover the situation after a Mode 1 or 2 start-up of the Interlocking but these will not normally be shown in the Control Tables. These conditions are covered later.

If points 225 were sufficiently close to signal 37, such that time of operation locking were required, then, after the setting of route 35B, points 225 would be locked in both directions unless ND was clear or occupied for a time period. This is added as a separate extra condition in the PFM file data for points 225 normal and reverse. See [SSI8003-10E](#) Section 2 for further details.

The Control Tables will contain the following for points 227:

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Locked by track circuits occupied: RF

Set and locked normal by routes: 37B, 123A

Set and locked reverse by routes: 37C, 123B

Route locking subsequently released by:

(NF, RE, RF clear, routes 37B, 37C normal)

(RE, RF clear, routes 123A, 123B normal)

(RF clear after 37B, 37C, 123A, 123B)

Overlap locking on point setting after routes 35B (with 225R) or 121 are set:

R -> N: Nil

N -> R: Nil

1.2 Panel Request Data

/ Panel request data for routes requiring overlaps

*QR35B

```

if R35B a
  P213 cnf
  @OL225A
then R35B s
  P213 cn
  UNC-AC 1 , UND-AB 1
  @OL225Q
  S35 clear bpull
\ .

```

*QR121

```

if R121 a
  P225 cnf
  @OL227A
then R121 s
  @P225QN
  URC-AB 1 , URD-AB 1 , ORE-AC 1
  @OL227Q
  S121 clear bpull
\ .

```

The "carry out tests at" list OL225A is to check that an overlap is available. In other circumstances, conditions such as tests for other overlaps-not-set that directly oppose a particular position of this intended overlap, should be included.

```
*OL225A  if ( P225 cnf or P225 crf , @OL227A ) \
```

The "carry out commands at" list OL225Q is to choose and lock an overlap. If possible the overlap is set in the direction in which points 225 (and 227 if the overlap is via 225 reverse) are controlled, otherwise the points are called to the required position. After a Mode 1 or 2 Interlocking start-up where neither control bit is set and either overlap is available then the normal direction is preferred.

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```

*OL225Q
( if P225 cr , @OL227A / via 225 already R
  then @OL227Q , ONF-AC 1 , ORE-BC 1
  \
or if P225 cnf / via 225 already or called N
  then P225 cn , ONF-AB 1
  \
or P225 cr , @OL227Q , ONF-AC 1 , ORE-BC 1 / via 225 called R
)

```

Note the use of the "alternative execution clause" type of data construct. The last alternative is executed by default, rather than test again for "P225 fr , @OL227A", in order to reduce data processing time, as this implied test has already been done in list OL225A [" P225 crf , @OL227A " equates to " (P225 cr or P225 fr) @OL227A "].

With the use of this default method, **it is essential** that the alternative tests in list OL225A are exactly equivalent to the actual and implied alternative tests in list OL225Q, i.e. no additional tests are included either in list OL225A or in list OL225Q. This is explained in detail in Chapter D, Section 4.

The "carry out commands at" lists below are to call the points and swing the overlap if previously locked in the opposite direction. These lists are referred to in place of the usual command to control the points when locking a forward or flank route, or as a result of a key switch operation (see below) or in the above example where the commands to control the points will swing other overlaps. For points for which these lists are provided, **it is essential** that all commands are examined, irrespective of file, and changed to references to these lists wherever overlap swinging can result.

The structure of the data in these lists, especially the inclusion of the "points not controlled" test and the position of the facing points command, shall be complied with. This is a defensive measure to help confirm that, with an overlap set, the commands for controlling points in the new overlap are only executed if the associated tests in the hinge points PFM file data have been carried out.

```

*P225QN
  if ONF-AC 1 , P225 xcn
  then ONF-AC f , ONF-AB 1
    if P225 dr then EP225 = 0 \
  \
  P225 cn
\

*P225QR
  if ONF-AB 1 , P225 xcr
  then ONF-AB f , ONF-AC 1 , ORE-BC 1 , @OL227QS
    if P225 dn then EP225 = 0 \
  \
  P225 cr
\

```

Similar "carry out tests at" and "carry out commands at" lists are provided for points 227 which are also hinge points in the overlap, with an additional "carry out commands at" list OL227QS which is used to select and lock an overlap over points

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227 as a result of swinging an overlap previously set over points 225 normal. This includes additional tests on "not route request" to make sure that the points are not unnecessarily moved into conflict with a forward route being set. These tests match those provided in the corresponding "carry out tests at" list OL227AC provided in the PFM data for evaluating the availability of the overlap in this situation (see Section 1.3 below). ALL route requests for the forward routes concerned that access these sub-routines should be tested (i.e. including QAR and QZR requests, split-part requests and cross-boundary AK requests, as appropriate).

Again, it is essential that the alternative tests in lists OL227A and OL227AC match the alternative actual and implied tests in the alternative execution clauses in lists OL227Q and OL227QS respectively (see Chapter D, Section 4 for further details of this matching).

Excessive data processing times often arise from data constructs for setting overlaps. The data in these OLxxxA & OLxxxQ type data constructs allows overlaps to be established immediately after a Mode 1 or 2 start-up, but a more restrictive option is shown in Chapter D, Section 1.1 that simplifies the data and reduces data processing time. Another option is shown in Chapter D, Section 1.2 which allows the splitting up of the data for each alternative overlap into separate requests.

```
*OL227A    if ( P227 cnf or P227 crf ) \

*OL227Q
  ( if P227 cr                               / via 227 already R
    then ORF-AC 1
    \
  or if P227 cnf                             / via 227 already or called N
    then P227 cn , ORF-AB 1
    \
  or P227 cr , ORF-AC 1                       / via 227 called R
  )
\

*OL227QS
  ( if ~QR37B , P227 cr                       / via 227 already R
    then ORF-AC 1
    \
  or if ~QR37C , P227 cnf                     / via 227 already or called N
    then P227 cn , ORF-AB 1
    \
  or P227 cr , ORF-AC 1                       / via 227 called R
  )
\

*P227QN
  if ORF-AC 1 , P227 xcn
  then ORF-AC f , ORF-AB 1
    if P227 dr then EP227 = 0 \
  \
  P227 cn
\
```