



## Appendix F, *Statement of application and compliance*

Network Rail guidance

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## 1 Introduction

### 1.1 Background

The concept of Modular Signalling has been adopted and developed within Network Rail to introduce new products and changes in the implementation of signalling projects in order to bring about significant cost savings.

### 1.2 Scope

This document applies to all projects deemed to be Modular Signalling Schemes and being implemented on Network Rail infrastructure.

The handbook contains principles and derogations which may only be used in the context of a Modular Signalling Scheme and use in any other context or project type is not supported by this handbook.

This document details the scope of derogations/variations from RSSB Group and Network Rail standards which have been agreed with the standard owners as being suitable for use in Modular Signalling Schemes.

### 1.3 Definitions

Common definitions are contained within NR/L2/SIG/30097.

### 1.4 References

| Name                      | Version | Date      | Number          | Location                                 |
|---------------------------|---------|-----------|-----------------|------------------------------------------|
| TNC Register              | 2.40    | 11/7/2013 | 9341544         | CCMS                                     |
| Repository of Information | 1.0     | 11/7/2013 | 63906049        | CCMS                                     |
| Modular Signalling        | 2       | 2/6/2012  | NR/L2/SIG/30097 | Connect/Network Rail Standards Libraries |

Please note that the appendices of NR/L2/SIG/30097 contain requirements. Within this document, these are detailed as (NR/L2/SIG/30097 Requirement **MSAC 1.4**) for example.

## 2 Statement of application and compliance

### 2.1 Standards Applicable to Modular Signalling Schemes

Modular Signalling schemes authorised during ORR Control Periods 4 and 5 shall apply the Railway Group and Network Rail Company Standards applicable at the start of December 2011 (as reiterated in Clause 10 of NR/L2/SIG/30097).

Standards changes and their impact during this period will be reviewed by the Modular Signalling System Authority and NR/L2/SIG/30097 revised accordingly where a worthwhile safety or commercial benefit can be obtained.

### 2.2 Standards Review Process

The Modular Signalling System Authority will maintain a List of Standards that will use, as its baseline, the standards at the end of December 2011.

Periodically, the Modular Signalling System Authority will meet to review standards issued as a result of the RSSB or Network Rail standards issuing processes.

Information will also be obtained from Modular Signalling suppliers regarding new standards or requirements particularly where standards are issued from a source other than RSSB or Network Rail Standards Management (such as contract documentation and Project Requirements Specifications). These standards or requirements can sometimes impact upon suppliers.

A list will be maintained of the standards issued and a review will be undertaken, and recorded, that will determine if the standard issued has no impact, has an impact but will not be applied, has an impact but will require a variation application or has an impact and will be applied.

If a standard has an impact and will be applied, it will be added to the List of Standards in a controlled manner.

If a standard has an impact and requires a variation application, it will be added to this Appendix (see **2.4.7**) and the TNC Register.

## 2.3 Variation Identification

NR/L2/SIG/30097 is the culmination of a significant development by Network Rail and as such has generated a large number of variations and derogations which have been progressed in line with Company Standards. There are also interpretations and decisions regarding standards compliance that never went to a formal variation application.

The issues and ideas that have either required derogations or have been subject to review and interpretation have arisen from a number of sources namely:

- Submissions for GRIP 3 and GRIP 4 contracts by SSL, Invensys and GE/First Engineering
- Development of the Modular Signalling proposals by both the suppliers and Network Rail
- A series of workshops with SSL and Invensys in Autumn 2009
- Review meetings with SSL and Invensys from May 2010
- Design of the Modular Signalling systems
- Testing of the Modular Signalling systems

The identification of an issue does not necessarily mean a variation application was required but was the first point for review and research which involves discussions on practicality of applying for the derogation and the benefits it would bring, interpretation of standards, discussions with Professional Heads, etc.

These issues are documented within a spreadsheet known as the TNC Register which is a document within Network Rail's CCMS2 system ([9341544](#)). In order to view the latest status of derogations associated with Modular Signalling please refer to the TNC Register. This Register details what decisions have been made and any assumptions. Additionally, a Repository of Information is available within CCMS2 ([63906049](#)) which contains certificates and documentation associated with the derogations in the subsequent sections of this document. Its folder structure directly relates to the clause numbers within this document.

Within the TNC Register, derogations are arranged into three main sections (separate worksheets) which are documented in the following sections of this Appendix:

- Derogation List (Active) – covered in Pilot Scheme Derogations (National) (Section 3.1 for overview and Section 4 for a detailed list) and Pilot Scheme Derogations (Site Specific) (Section 3.2 for overview and Section 5 for a detailed list)
- Derogation List (Future) - covered in Future Scheme Derogations (Section 3.3 for overview and Section 6 for a detailed list)
- Derogation List (Archive) – covered in Derogations not Progressed for Pilot Schemes (Section 3.4 for overview and Section 7 for a detailed list)

Within each section, issues were further classified into topic areas. Please note that the topic classifications are sometimes arbitrary and overlapping and are a continuation of the initial classification done as part of the Autumn 2009 workshops.

## 2.4 Additional Variations

### 2.4.1 Preamble

Whilst significant work has been undertaken on determining variations during the two pilot schemes, it is probable that additional variation applications will emanate from the following sources identified below.

### 2.4.2 Pilot Scheme Standard Freeze Dates

It shall be noted that the pilot schemes were developed and let under traditional signalling framework contracts and therefore have the following standards freeze dates:

- ETN Pilot Scheme (Signalling Solutions) April 2010
- SYC Pilot scheme (Invensys) December 2010

It is therefore quite likely that there will be standards issued after the pilot scheme freeze dates and the December 2011 standards cut-off date (NR/L2/SIG/30097 Clause 10) that could have implications and a potential variation issue to be investigated and applied for.

The Modular Signalling System Authority will consider these standards as part of the Standards Review Process.

### 2.4.3 Additional Modular Signalling Suppliers

If there were further suppliers of Modular Signalling systems, then different technology and/or approaches would mean that additional variation issues might be present and require identification, research and applications.

It is probable that additional suppliers would require a pilot scheme. It is expected a similar process of collaborative working would happen that would result in the Modular Signalling System Authority actively being involved in the identification of variation issues.

### 2.4.4 Conversion of Pilot Scheme Derogations (Site Specific)

These issues, detailed in Section 5, that will need to either be converted to a National derogation or reapplied for per scheme.

## 2.4.5 Conversion of Future Scheme Derogations

These issues, detailed in Section 6, would be investigated either at the request of a project or a decision by the Modular Signalling System Authority where a worthwhile safety or commercial benefit can be obtained.

## 2.4.6 Derogations Not Progressed for Pilot Schemes

These issues, detailed in Section 7, would be investigated either at the request of a project or a decision by the Modular Signalling System Authority where a worthwhile safety or commercial benefit can be obtained.

## 2.4.7 Mandatory Standards

There might be standards that, despite the December 2011 freeze, are potentially required to be implemented. If necessary, as part of the Standards Review Process, the Modular Signalling System Authority would review this standard and, if appropriate, would need to make an application for variation.

## 2.4.8 Additional Development Work after Pilot Scheme

There might be several reasons why a supplier, having completed a Modular Signalling pilot scheme, would like further variation investigation works undertaken (e.g., changes in applicable technology, development constraints with the pilot scheme, etc.).

A Project Team will need to discuss who will undertake this additional investigation work with the Modular Signalling System Authority. Also, any investigation work will need a worthwhile safety or commercial benefit obtaining as a result.

## 2.4.9 Non-Modular Signalling Schemes

There might be schemes that are not designated as Modular Signalling schemes, due to their development and/or complexity, but there might be a requirement to extend variation certificates obtained for Modular Signalling. Examples include application of Modular Signalling technology on conventional schemes, etc.

A Project Team will need to discuss who will undertake this additional investigation work with the Modular Signalling System Authority.

It is also worth noting that schemes, not designated as a Modular Signalling schemes, will not be subject to the standards freeze of December 2011 potentially requiring additional variation investigation and application work.

#### 2.4.10 Application Process

The decision to apply for additional variations will require Project Teams to involve the Modular Signalling System Authority. Apart from its ownership of NR/L2/SIG/30097, there might be a need for resources from within the Modular Signalling System Authority to assist in the variation investigation and application process.

The above will be required to a greater or lesser degree for all the circumstances where additional variation investigation and application is required.

Where a variation to a Standard is required but not included in the list of variations granted under NR/L2/SIG/30097 Appendix F, it shall be identified, justified and supported, as necessary, by risk assessments and draft Tracker Forms from the suppliers. The approval shall be by following conventional company processes.

### 3 Derogation Classification

#### 3.1 Pilot Scheme Derogations (National)

These are the issues that were in place at May 2010 that would be researched and progressed for the pilot schemes and were granted as a national derogations for Modular Signalling or for specific equipment. They are contained within the Derogation List (Active) tab of the TNC Register document and emerging potential derogations required for the Invensys and SSL pilot schemes were added to this list as they were identified.

Please note that if a derogation was rejected these will be highlighted as the need to revisit these, with new arguments, in Future Schemes might be required (i.e., they become a Future Scheme Derogation). A Project Team will need to discuss who will undertake the work to reapply for the derogation with the Modular Signalling System Authority.

All other issues at May 2010, which were not being taken forward, became Derogations not Progressed for the Pilot Scheme (Section 3.4 for overview and Section 7 for a detailed list).

New variations would be added to Pilot Scheme Derogations (National) as a result of activities (detailed in Section 2.4) including:

- Standards that applied between the Pilot Scheme Standards freeze dates and the NR/L2/SIG/30097 Standards freeze date of December 2011.
- Standards that are introduced after the Standards Freeze date of December 2011 where there is a formal requirement to challenge implementation to NR/L2/SIG/30097.
- Subsequent Modular Signalling suppliers who introduce potential derogation issues as a result of requiring a Pilot Scheme
- Investigation of Pilot Scheme Derogations (Site-Specific)
- Investigation of Future Scheme Derogations
- Investigation of Derogations not Progressed for Pilot Schemes
- Amendments to existing Modular Signalling systems
- Extension of variations to conventional schemes

### 3.2 Pilot Scheme Derogations (Site Specific)

These are the issues that were in place at May 2010 that would be researched and progressed for the pilot schemes either as a site-specific derogation or that were granted as such. They are contained within the Derogation List (Active) tab of the TNC Register document and emerging potential site-specific derogations required for the pilot schemes were added to this list as they are identified.

Please note that if a derogation was or granted as site specific only, there may be need to revisit these in Future Schemes (either to extend a site specific derogation to another site or to convert them to a national derogation) and, in effect, they become a Future Scheme Derogation.

A Project Team will need to discuss who will undertake this conversion work with the Modular Signalling System Authority.

It is intended that updates to this section would happen when site-specific derogations are converted to national derogations or there has been a change in policy that would prevent it. It would never be a repository for geographic individual derogations required for Future Schemes.

The relevant entry will detail whether there is a requirement for National conversion, re-application per scheme or no action.

### 3.3 Future Scheme Derogations

These were issues identified after May 2010 that will not be progressed for the pilot schemes but could be for Future Schemes. They are listed within the Derogation List (Future) tab of the TNC Register document.

A Project Team will need to discuss who will undertake the work to apply for any of these derogations with the Modular Signalling System Authority.

It is probable that this section would only change as issues are investigated and closed out (either as rejections or approvals) and these changes would be reflected in this Appendix.

The relevant entry will detail whether there is a requirement for application or no action necessary.

### 3.4 Derogations not Progressed for Pilot Schemes

These were issues identified before May 2010 that were not taken forward (either due to not being applicable or other reasons) for the pilot schemes. They are listed within the Derogation List (Archive) tab of the TNC Register document. These could be revisited for Future Schemes if different arguments or technology might change the outcome. A Project Team will need to discuss who will undertake the work to apply for any of these derogations with the Modular Signalling System Authority.

It is probable that this section would only change as issues are investigated and closed out (either as rejections or approvals) and these changes would be reflected in this Appendix.

### 3.5 Explanation of Table Entries

#### 3.5.1 Specific Issue (Reference Number within TNC Register) (Blue letters refer to columns in the TNC Register)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                              |                        |                             |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------|-----------------------------|
| <b>Brief description of Current Practice/Process</b>   | The current process required by a standard <b>(D)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              |                        |                             |
| <b>Departures from Current Practice/Process</b>        | How the Modular Signalling system differs from the current practice <b>(E)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |                        |                             |
| <b>Reason for wanting to challenge the standard</b>    | The reasons why a challenge is suitable including cost-benefit and efficiency <b>(F)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |                        |                             |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b><br><b>(G)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Version</b><br><b>(H)</b> | <b>Date</b> <b>(I)</b> | <b>Clause</b><br><b>(J)</b> |
|                                                        | If yes, specific standard, version, date and clause detailed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                              |                        |                             |
| <b>Variation applied for</b>                           | Yes or No <b>(X)</b> (Tracker Number {and RSSB reference <b>(AD)</b> if applicable} added if Yes <b>(Y)</b> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |                        |                             |
| <b>Type of Variation obtained</b>                      | <p>If applicable, this will either be a Derogation, Variation pending Standards Change or a Temporary Variation.</p> <p>The NC reference in brackets (taken from NR/L2/EBM/STP001/F045) is:</p> <p>NC1 National (All Routes)<br/> NC2 Specific Route (All Delivery Units)<br/> NC3 Multiple Delivery Units<br/> NC4 Single Delivery Unit (this can include Investment Projects)</p> <p>If the certificate has conditions this is mentioned here with the full details within Future Actions</p> <p>If this is a TNC, a separate line will detail the expiry date <b>(AW)</b></p> <p>If not applicable, then this will detail whether regularisation was done by another means or there was no Variation needed.</p> <p><b>(AC)</b></p> |                              |                        |                             |
| <b>Applicability</b>                                   | <p>Whether this is specific to a supplier or technology or not <b>(AV)</b></p> <p>A full explanation is (with any specific</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |                        |                             |

|                       |                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | restrictions detailed in Future Actions):                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                       | ?                                                                                                                                                                                                                                                                                                 | To be determined                                                                                                                                                                                                                                                                                                                                                                                                           |
|                       | Modular Signalling Schemes (All)                                                                                                                                                                                                                                                                  | All schemes designated as a Modular Signalling Scheme and safety approved as such. The derogation would apply to Pilot Schemes as long as there was a demonstration that the derogation parameters had not been breached                                                                                                                                                                                                   |
|                       | Modular Signalling Schemes (SSL)                                                                                                                                                                                                                                                                  | All schemes designated as a Modular Signalling Scheme and safety approved as such using the concepts and products developed by SSL and used in the ETN Pilot Scheme.<br><br>This would apply if there were any changes in SSL's name or company ownership as long as the same concepts and products were used.                                                                                                             |
|                       | Modular Signalling Schemes (WRSL)                                                                                                                                                                                                                                                                 | All schemes designated as a Modular Signalling Scheme and safety approved as such using the concepts and products developed by Invensys and used in the SYC Pilot Scheme.<br><br>The term WRSL is used as this is what Invensys were known as at the start of development and would equally apply to if there were any changes in Invensys' name or company ownership as long as the same concepts and products were used. |
|                       | National (All Signalling Systems)                                                                                                                                                                                                                                                                 | Applicable to all signalling schemes regardless of technology                                                                                                                                                                                                                                                                                                                                                              |
|                       | National (Frauscher Axle Counters)                                                                                                                                                                                                                                                                | Applicable to Frauscher Axle Counters                                                                                                                                                                                                                                                                                                                                                                                      |
|                       | National (SSI or derivative technology)                                                                                                                                                                                                                                                           | Applicable to all signalling schemes using SSI or derivative technology (e.g., WESTLOCK, SMARTLOCK).                                                                                                                                                                                                                                                                                                                       |
|                       | National (WESTRACE)                                                                                                                                                                                                                                                                               | Applicable to all signalling schemes using WESTRACE technology (as used on the SYC pilot and not earlier derivatives)                                                                                                                                                                                                                                                                                                      |
|                       | None                                                                                                                                                                                                                                                                                              | See Type of Variation Obtained ( <a href="#">AC</a> )                                                                                                                                                                                                                                                                                                                                                                      |
|                       | Site Specific                                                                                                                                                                                                                                                                                     | Specific to a location or line of route                                                                                                                                                                                                                                                                                                                                                                                    |
|                       | National (GCP4000)                                                                                                                                                                                                                                                                                | Applicable to all schemes using GCP4000 technology                                                                                                                                                                                                                                                                                                                                                                         |
|                       | National (S60 Barrier Machines)                                                                                                                                                                                                                                                                   | Applicable to all schemes using S60 barrier machine technology                                                                                                                                                                                                                                                                                                                                                             |
|                       | National (Smartlock)                                                                                                                                                                                                                                                                              | Applicable to all schemes using SMARTLOCK technology                                                                                                                                                                                                                                                                                                                                                                       |
|                       | National (IECC Scalable)                                                                                                                                                                                                                                                                          | Applicable to all schemes using IECC Scalable technology                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Notes</b>          | A brief explanation of the specific application process and issues encountered                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Future actions</b> | <p>Future actions on Suppliers, Project Teams, Professional Heads or the Modular Signalling Systems Authority</p> <p>This will include specific certificate conditions and limitations on product versions</p> <p>If the standard has been updated then this will be detailed in this section</p> |                                                                                                                                                                                                                                                                                                                                                                                                                            |

|  |                                                                                                                                                                                                                                                          |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>If there has been a further application to extend a Modular Signalling certificate to conventional schemes, this will be detailed here including the Tracker Number. These applications might be ongoing at the time of publication.</p> <p>(AQ).</p> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 4 PILOT SCHEME DEROGATIONS (National)

### 4.1 Axle Counters

#### 4.1.1 Axle Counter Stub Length (DER-51)

|                                                        |                                                                                                                                                                                                                                                                                                                                                   |                |             |               |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Axle Counter Stub Length being measured on site before data design                                                                                                                                                                                                                                                                                |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Treat all stubs as >10m (>4m for crossovers) so they need to be replaced by a wheeled passage                                                                                                                                                                                                                                                     |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | No need to survey stub lengths on site. More complicated but standard data and elimination of engineering decision making but with a loss of operational flexibility                                                                                                                                                                              |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                            | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L2/SIG/30081                                                                                                                                                                                                                                                                                                                                   | 1              | 05/09/2009  | 6.7.4         |
| <b>Variation applied for</b>                           | n/a                                                                                                                                                                                                                                                                                                                                               |                |             |               |
| <b>Type of Variation obtained</b>                      | No NC Needed                                                                                                                                                                                                                                                                                                                                      |                |             |               |
| <b>Applicability</b>                                   | Modular Signalling Schemes (All)                                                                                                                                                                                                                                                                                                                  |                |             |               |
| <b>Notes</b>                                           | A draft application was written but the Professional Head's view was that the standard does not mandate the release of the stub only the conditions if you do. Therefore Modular Signalling is compliant in making the stub release more restrictive without the need for a formal application                                                    |                |             |               |
| <b>Future actions</b>                                  | A change in approach due to Tracker 9175 being withdrawn (see 4.1.2), means most stubs will be measured using Omnicom. It is not advantageous to leave potentially long-term aspect restricted stubs when there are reasonable means to determine their length without a site visit. This is detailed in NR/L2/SIG/30097 Appendix H3 Section 5.3. |                |             |               |

#### 4.1.2 Removal of Aspect Restriction before Application of STR/EPR (DER-114, DER-115)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |             |               |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Not allowing STR/EPR to be applied when the axle counter section has aspect restricted segments                                                                                                                                                                                                                                                                                                                                                                                                                          |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Following SSI DIS 112 (Version 12) and DIS 114 (Version 17) for STR/EPR which does not comply with NR/L2/SIG/30080                                                                                                                                                                                                                                                                                                                                                                                                       |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Following the decision taken on axle counter stub length measurement before data design (4.1.1), Invensys realised that a railway with potentially long term aspect restricted stubs would give rise to issues when trying to apply STR/EPR. As previous practice (documented in the SSI discussion papers DIS112 and DIS114 at the time) did not demand the aspect restrictions were removed, a variation application seemed the simplest solution.                                                                     |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L2/SIG/30080                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1              | 05/09/2009  | 7.4.2         |
|                                                        | NR/L2/SIG/30080                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1              | 05/09/2009  | 7.5.2         |
| <b>Variation applied for</b>                           | Yes (Tracker 9175)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |             |               |
| <b>Type of Variation obtained</b>                      | Withdrawn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |             |               |
| <b>Applicability</b>                                   | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |             |               |
| <b>Notes</b>                                           | A variation application was made but due to SSIAG requiring the DIS papers to be changed to meet the standard, there was not a strong enough argument to grant a variation. A review took place of the reasons for application in the first place and because it became clear that measuring diverging and crossover stubs did not require a site visit, making use of the Omnicom HD video (see 4.1.1), the main basis for the application (saving on site visits) was not present. The application was then withdrawn. |                |             |               |
| <b>Future actions</b>                                  | <p>None other than following the revised strategy for stub length measurement which is contained within NR/L2/SIG/30097 Appendix H3 Section 5.3 (see 4.1.1).</p> <p>The Cardiff Area Signalling Renewals Scheme successfully gained a Variation Pending Standards Change (NC1) (Tracker 10684; Project Reference CASR/NC/115) to follow previous practice</p>                                                                                                                                                            |                |             |               |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>when altering workstations for consistency. As the concept of a Modular Workstation has been overtaken by the National Operating Strategy, it is likely a supplier might have to make use of Tracker 10684. However, the prime determination of whether to follow current or previous practice should be determined within any Ergonomics Study for the project.</p> <p>There might be possibilities that the Remote Interface (RIF) being developed to allow re-control under Network Rail's National Operating Strategy (NOS) will resolve some of these issues.</p> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 4.1.3 Detection Point Nomenclature (DER-116)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |             |                |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|----------------|
| <b>Brief description of Current Practice/Process</b>   | The current practice is based on the use of track section names                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |             |                |
| <b>Departures from Current Practice/Process</b>        | Use of unique detection point number to avoid producing additional design detail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |             |                |
| <b>Reason for wanting to challenge the standard</b>    | A smaller number of detection points on a Modular Signalled railway do not need the same level of definition to aid maintainers over where a detection point is                                                                                                                                                                                                                                                                                                                                                                                                                                |                |             |                |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Version</b> | <b>Date</b> | <b>Clause</b>  |
|                                                        | NR/L2/SIG/30081                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1              | 05/09/2009  | 5.3.1<br>5.3.2 |
| <b>Variation applied for</b>                           | Yes (Tracker 9162)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |             |                |
| <b>Type of Variation obtained</b>                      | Derogation (NC1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |             |                |
| <b>Applicability</b>                                   | Modular Signalling Schemes (WRSL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |             |                |
| <b>Notes</b>                                           | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |                |
| <b>Future actions</b>                                  | <p>An extension to this certificate has been applied for under Tracker 13770 which is:</p> <p><b>Variation Pending Standards Change (NC1)</b></p> <p><b>Geographic Scope</b> - This application is national for schemes using axle counters, regardless of whether the scheme is considered Conventional or has been designated as a Modular Signalling Scheme.</p> <p><b>Rationale</b> – any new axle counter product would need to have a logical method of detection point nomenclature which recognised the system architecture and that was documented for designers and maintainers.</p> |                |             |                |

## 4.1.4 Reference Direction (DER-117)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |             |                |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|----------------|
| <b>Brief description of Current Practice/Process</b>   | Reference direction is in the direction of increasing mileage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |             |                |
| <b>Departures from Current Practice/Process</b>        | Reference direction will be the direction of travel not increasing mileage (Frauscher feature)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |             |                |
| <b>Reason for wanting to challenge the standard</b>    | As the Frauscher head is a single unit, to achieve this would require wheel sensors to be fitted to opposite rails unless software was reprogrammed. Adopting the same rail for installation (unless cant prevents it) gives a more consistent approach to the installer/maintainer.                                                                                                                                                                                                                                                                                                        |                |             |                |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Version</b> | <b>Date</b> | <b>Clause</b>  |
|                                                        | NR/L2/SIG/30081                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1              | 05/09/2009  | 5.3.1<br>5.3.2 |
| <b>Variation applied for</b>                           | Yes (Tracker 9161)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |             |                |
| <b>Type of Variation obtained</b>                      | Derogation (NC1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |             |                |
| <b>Applicability</b>                                   | Modular Signalling Schemes (WRSL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |                |
| <b>Notes</b>                                           | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |             |                |
| <b>Future actions</b>                                  | <p>An extension to this certificate has been applied for under Tracker 13771 which is:</p> <p><b>Variation Pending Standards Change (NC1)</b></p> <p><b>Geographic Scope</b> - This application is national for schemes using axle counters, regardless of whether the scheme is considered conventional or has been designated as a Modular Signalling Scheme.</p> <p><b>Rationale</b> – the overriding principle is that the reference direction needs to be determined on a logical basis, documented as part of the system, and rules are documented for designers and maintainers.</p> |                |             |                |

## 4.1.5 Card/Evaluator Naming (DER-118)

|                                                      |                                                                                                                                                                                                                                                          |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Brief description of Current Practice/Process</b> | Based on Thales AZLM architecture having evaluators in centralised REBs rather than distributed                                                                                                                                                          |
| <b>Departures from Current Practice/Process</b>      | Invensys propose to be compliant with the high level requirements of Clause 6.4 (No two evaluators shall have the same name within a signal box or control centre area) but intend to name each evaluator rack according to the name of the Axle Counter |

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |                                        |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|----------------------------------------|
|                                                        | Object Controller (OC(A))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |             |                                        |
| <b>Reason for wanting to challenge the standard</b>    | Frauscher Architecture, and its application in the Invensys Modular Signalling system, means a prescriptive method is not appropriate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |             |                                        |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Version</b> | <b>Date</b> | <b>Clause</b>                          |
|                                                        | NR/L2/SIG/30081                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1              | 05/09/2009  | 6.2.4<br>6.2.4.1<br>6.2.4.2<br>6.2.4.3 |
| <b>Variation applied for</b>                           | Yes (Tracker 9163)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |             |                                        |
| <b>Type of Variation obtained</b>                      | Derogation (NC1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |             |                                        |
| <b>Applicability</b>                                   | Modular Signalling Schemes (WRSL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |             |                                        |
| <b>Notes</b>                                           | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |             |                                        |
| <b>Future actions</b>                                  | <p>An extension to this certificate has been applied for under Tracker 13772 which is:</p> <p><b>Variation Pending Standards Change (NC1)</b></p> <p><b>Geographic Scope</b> - This application is national for axle counter systems with a distributed evaluator architecture, such as Frauscher, regardless of whether the scheme is considered conventional or has been designated as a Modular Signalling Scheme.</p> <p><b>Rationale</b> – the overriding principle is that no two evaluators shall have the same name within a signal box or control centre area but the standard takes account of other system architectures, especially ones with distributed evaluators. The rules shall be documented as part of the system, for designers and maintainers.</p> |                |             |                                        |

#### 4.1.6 Axle Counter/Level Crossing Interface (Invensys) (DER-119)

|                                                        |                                                                                                                   |                |             |                |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------|-------------|----------------|
| <b>Brief description of Current Practice/Process</b>   | Direct connection of evaluator to LX Control circuitry                                                            |                |             |                |
| <b>Departures from Current Practice/Process</b>        | Connection of the Frauscher system via transmission to a level crossing controller                                |                |             |                |
| <b>Reason for wanting to challenge the standard</b>    | The system architecture is not as described within NR/L2/SIG/30081 which is based on a traditional relay crossing |                |             |                |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                            | <b>Version</b> | <b>Date</b> | <b>Clause</b>  |
|                                                        | NR/L2/SIG/30081                                                                                                   | 1              | 05/09/2009  | 6.3.1<br>6.3.2 |
| <b>Variation applied for</b>                           | Yes (Tracker 10209)                                                                                               |                |             |                |
| <b>Type of Variation obtained</b>                      | Derogation (NC1) with conditions                                                                                  |                |             |                |
| <b>Applicability</b>                                   | Modular Signalling Schemes (WRSL)                                                                                 |                |             |                |

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Notes</b>          | <p>The issue is described in an axle counter standard but it should really be a holistic evaluation of any delay paths in the system from axle counter wheel sensor having a wheel flange pass over it to a system reaction (such as an RTL flashing, level crossing initiating, etc.). With MCB-OD, there are also the added issues, raised during review, of how long it takes the system to react to level crossing obstructions as requirements are within the MCB-OD Functional Requirements Specification.</p> <p>The extension to the certificate, detailed below, increases the scope to MCB-CCTVs as these can be found on conventional schemes or schemes where conversion to MCB-OD could be problematic or not cost-effective.</p> <p>Please note that the application to an AHB crossing (first used on the GN/GE scheme 106574), is compliant with NR/L2/SIG/30081 Clauses 6.3.1 and 6.3.2.</p> |
| <b>Future actions</b> | <p>During the research for this derogation, it became clear that the Invensys system would not give the 5s RTL flashing time required in NR/L2/SIG/11201 Module X02 Clause 8.1.10 (Clause 5.7.8 in NR/L3/SIG/30018 which means that it is applicable to the pilot project and its designers but with the difference that Module X02 now gives advice on the SPaD speed).</p> <p>The certificate was granted with two conditions:</p> <ol style="list-style-type: none"> <li>1. For Automatic LXs the strike ins shall be repositioned to allow for transmission delays.</li> <li>2. The response of the overrun detection at Wrenbury (Dn) and Harlescott (Dn) shall be measured and advised to HQ. A figure in excess of 2 seconds may require extra controls.</li> </ol> <p>Because of this and the other certificate</p>                                                                                   |

conditions, Invensys are modifying their system documentation to state:

1. Where used with an automatic crossing, the strike-in will be increased by the propagation delay (worst case)
2. If the signal cannot meet the requirements of X02 Clause 8.1.10, then it should be fitted with “Stowmarket” controls (X21 Clause 2.1.3). Invensys have recommended, within their timing document, that this should apply to signals within 100m of a crossing when implementing their Modular Signalling system

An extension to this certificate has been applied for under Tracker 13969 which is:

#### **Derogation (NC1)**

**Geographic Scope** - This application is national for Invensys schemes using WESTRACE interlockings (including those interlockings controlling MCB-OD and MCB-CCTV level crossings) and object controllers, regardless of whether the scheme is considered conventional or has been designated as a Modular Signalling Scheme.

**Rationale** – Invensys have holistically evaluated the delay in their system and have then used that to engineer its application. It is no different doing this on a Modular Signalling scheme than a conventional one.

As part of the extension, their document *Axle Counter Communication Timing Analysis X1507\_04\_04-TN00006* was raised from Version 0E (included with Tracker 10209) to Version 1.6. Apart from a slight alteration to the delay times, Invensys have now determined that the range of signal to level crossing distance where they have to increase the applicability of “Stowmarket” controls reduces from 100m to 80m.

## 4.1.7 Axle Counter/Level Crossing Interface (SSL) (DER-120)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |             |                |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|----------------|
| <b>Brief description of Current Practice/Process</b>   | Direct connection of evaluator to LX Control circuitry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |             |                |
| <b>Departures from Current Practice/Process</b>        | SSL Central Evaluation of axle counters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |             |                |
| <b>Reason for wanting to challenge the standard</b>    | The system architecture is not as described within NR/L2/SIG/30081 which is based on a traditional relay crossing                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |             |                |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Version</b> | <b>Date</b> | <b>Clause</b>  |
|                                                        | NR/L2/SIG/30081                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1              | 05/09/2009  | 6.3.1<br>6.3.2 |
| <b>Variation applied for</b>                           | Yes (Tracker 9088)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |             |                |
| <b>Type of Variation obtained</b>                      | Derogation (NC1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |             |                |
| <b>Applicability</b>                                   | Modular Signalling Schemes (SSL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |             |                |
| <b>Notes</b>                                           | <p>The issue is described in an axle counter standard but it should really be a holistic evaluation of any delay paths in the system from axle counter wheel sensor having a wheel flange pass over it to a system reaction (such as an RTL flashing, level crossing initiating, etc.). With MCB-OD, there are also the added issues, raised during review, of how long it takes the system to react to level crossing obstructions.</p> <p>SSL demonstrated that they could meet the clause but this was due to the use of relay controlled level crossings located adjacent to the MCB-OD</p> |                |             |                |
| <b>Future actions</b>                                  | <p>None for the pilot</p> <p>Whilst there are no formal Certificate Conditions, the derogation only applies to the currently Safety Approved SSL Modular Signalling System which is based on relay-operated MCB-OD level crossings and centralised axle counter architecture.</p> <p>Future schemes might need to re-evaluate compliance dependent on the system architecture and particularly how axle counters and other train detection technology interfaces with the level crossing control technology. This would also apply if used for crossing types other than MCB-OD.</p>            |                |             |                |

#### 4.1.8 Provision of Axle Counter Cable Core Plan and Axle Counter Schematics (DER-121)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |             |               |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Provision of Axle Counter Cable Core Plan and Axle Counter Schematics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Non-provision of Axle Counter Cable Core Plan and Axle Counter Schematics due to consolidation in TES and no multi-pair cables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Cost and lack of layout complexity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L2/SIG/30081                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1              | 05/09/2009  | 6.11          |
| <b>Variation applied for</b>                           | Yes (Tracker 8919)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |             |               |
| <b>Type of Variation obtained</b>                      | Derogation (NC1) with conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |             |               |
| <b>Applicability</b>                                   | Modular Signalling Schemes (WRSL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |             |               |
| <b>Notes</b>                                           | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |             |               |
| <b>Future actions</b>                                  | <p>Currently the specific certificate condition is Derogation applicable to Modular Signalling schemes only.</p> <p>An extension to this certificate has been applied for under Tracker 13939 which is:</p> <p><b>Derogation (NC1)</b><br/> <b>Geographic Scope</b> - This application is national for Invensys schemes using WESTRACE interlockings, object controllers and Frauscher Axle Counters, regardless of whether the scheme is considered conventional or has been designated as a Modular Signalling Scheme.<br/> <b>Rationale</b> – The system architecture is the same regardless of application to a conventional or Modular Signalling scheme and therefore the design documentation required should be the same.</p> |                |             |               |

#### 4.1.9 2km Limit on Axle Counter Circuits (DER-122, FUT-9)

|                                                      |                                                                                                                                                                                                                      |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Brief description of Current Practice/Process</b> | 2km limitation for axle counter circuits                                                                                                                                                                             |
| <b>Departures from Current Practice/Process</b>      | Modular Signalling axle counter circuit length, between the Signalling Island REB and the trackside detection point has been designed to exceed the 2,000m limitation imposed by NR/L2/SIG/30081 and NR/GN/SIG/11600 |

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |               |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Reason for wanting to challenge the standard</b>    | The cost of Intermediate Locations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L2/SIG/30081                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1              | 05/09/2009  | 6.10.3        |
| <b>Variation applied for</b>                           | Yes (Tracker 9775)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |             |               |
| <b>Type of Variation obtained</b>                      | NC Pending Standards Change (NC1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |             |               |
| <b>Applicability</b>                                   | National (All Signalling Systems)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |             |               |
| <b>Notes</b>                                           | <p>The clause that NR/L2/SIG/30081 refers to is NR/GN/SIG/11600 Part D Clause 4.3 which is now contained within NR/L2/SIG/11201 Module B3.</p> <p>An application was not made for the pilot as the line was not electrified. NR/L2/SIG/30081 emphasises the issues regarding induced voltage. NR/L2/SIG/11201 Module B3 contains other controls that are based on the operation of relay circuits which are not applicable.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |               |
| <b>Future actions</b>                                  | <p>SSL would have needed to determine application rules for ac electrified railways both to undertake a Modular Scheme on one and to provide a basis to determine immunisation measures on non-electrified routes.</p> <p>The Cardiff Area Signalling Renewals Scheme successfully gained a Variation Pending Standards Change (NC1) (Tracker 9775; Project Reference CASR/NC/068) which stated:</p> <p><i>It is proposed to replace 6.10.3 with the following text:</i></p> <p><i>In a.c. electrified areas the design shall take account of the requirement in EN50122# to limit touch potentials to the following time dependent limits:-</i></p> <p><i>60 Va.c. continuous</i><br/> <i>670 Va.c. for a maximum of 200 ms (Under traction fault conditions)</i><br/> <i>842 Va.c. for a maximum of 100 ms (Under traction fault conditions)</i></p> <p><i>A length of through connected conductor parallel to the line not exceeding 2 km will</i></p> |                |             |               |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><i>generally satisfy this requirement.</i></p> <p><i>Longer lengths may be used subject to calculation or demonstration that induced voltages remain within the above limits.</i></p> <p>Where the equipment manufacturer's manual specifies lower limits for technical reasons, the lower limit shall be applied.</p> <p><i># EN50122, IEC 62128-1, Railway Applications - Fixed Installations - Part 1: Protective provisions relating to electrical safety and earthing</i></p> <p>This now means that in order to have axle counter circuits over 2km, that a variation application would not be needed. Both suppliers and project teams need to determine who would have both the competence and the technical authority to accept any risk assessments, calculations, demonstrations, etc. It is usually expected that this would be a national body.</p> |
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#### 4.1.10 Axle Counter Evaluator/Detection Point Backup Arrangements (DER-123, ARCH-29)

|                                                        |                                                                                                                                                                                                       |                |             |               |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Axle counter evaluator being backed up by a separate UPS                                                                                                                                              |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Detection points being backed up by the SI-REB UPS                                                                                                                                                    |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Standard does not consider other architectures                                                                                                                                                        |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L2/SIG/30081                                                                                                                                                                                       | 1              | 05/09/2009  | 6.8<br>6.9    |
| <b>Variation applied for</b>                           | n/a                                                                                                                                                                                                   |                |             |               |
| <b>Type of Variation obtained</b>                      | No NC Needed                                                                                                                                                                                          |                |             |               |
| <b>Applicability</b>                                   | Modular Signalling Schemes (All)                                                                                                                                                                      |                |             |               |
| <b>Notes</b>                                           | <p>The requirements of clause 6.9 are not mandatory.</p> <p>Clause 6.8 is met through the supplier's use of 4 hour standby supplies (Invensys) or using control centre back up arrangements (SSL)</p> |                |             |               |
| <b>Future actions</b>                                  | None unless there are issues arising out of the pilot schemes in their initial operational life.                                                                                                      |                |             |               |

**4.1.11 Maximum Axle Count (DER-148)**

|                                                        |                                                                                                                                                                                                                                                                                                                |                |             |               |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | The axle counter system shall be capable of determining axle counter section occupancy for trains with up to 500 axles. If the number of axles within an axle counter section exceeds the defined maximum, the status of the section shall be set to 'Disturbed' and remain 'Disturbed' until reset to 'Clear' |                |             |               |
| <b>Departures from Current Practice/Process</b>        | The Frauscher System can count up to 8191 axles                                                                                                                                                                                                                                                                |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | It is not clear whether the 500 axles is an upper limit or technology driven                                                                                                                                                                                                                                   |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                         | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L3/SIG/30082/004                                                                                                                                                                                                                                                                                            | 1              | 06/03/2010  | 2.6.5         |
| <b>Variation applied for</b>                           | n/a                                                                                                                                                                                                                                                                                                            |                |             |               |
| <b>Type of Variation obtained</b>                      | No NC Needed                                                                                                                                                                                                                                                                                                   |                |             |               |
| <b>Applicability</b>                                   | National (All Signalling Systems)                                                                                                                                                                                                                                                                              |                |             |               |
| <b>Notes</b>                                           | After a query to the Signal Engineer's Helpline (SIG/INT/2011/128), it was determined a variation application was not needed.                                                                                                                                                                                  |                |             |               |
| <b>Future actions</b>                                  | None                                                                                                                                                                                                                                                                                                           |                |             |               |

**4.1.12 Use of Software Isolation Link (DER-149)**

|                                                        |                                                                                                                                                                 |                |             |               |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | A physical isolation link shall be provided for each axle counter section, operable by the maintainer under controlled circumstances.                           |                |             |               |
| <b>Departures from Current Practice/Process</b>        | NR/L3/SIG/30082/004 Clause 3.3.1 requires a physical isolation link that the Frauscher system does not have                                                     |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | The link exists but in a software form as the isolation is done via the Technician's Facilities                                                                 |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                          | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L3/SIG/30082/004                                                                                                                                             | 1              | 06/03/2010  | 3.3.1         |
| <b>Variation applied for</b>                           | Yes (Tracker 10516)                                                                                                                                             |                |             |               |
| <b>Type of Variation obtained</b>                      | Derogation (NC1) with conditions                                                                                                                                |                |             |               |
| <b>Applicability</b>                                   | Modular Signalling Schemes (WRSL)                                                                                                                               |                |             |               |
| <b>Notes</b>                                           | The controls are in place within the WESTRACE data as the system can differentiate between a technician occupying an axle counter or the axle counter doing so. |                |             |               |
| <b>Future actions</b>                                  | The condition on the certificate was:<br><br><i>"Procedures to be in place to cover how</i>                                                                     |                |             |               |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><i>controls are retained if the Technicians Terminal/Interlocking restarted. In particular how this is managed across a number of locations that Technicians controls could be applied. Similar process will apply to Temporary Approach Control and route bars etc."</i></p> <p>This will require a site-specific action per scheme (or a set of generic rules producing)</p> <p>An extension to this certificate has been applied for under Tracker 13943 which is:</p> <p><b>Variation Pending Standards Change (NC1)</b></p> <p><b>Geographic Scope</b> - This application is national for Frauscher Axle Counters as long as the interlocking can implement a software isolation link and that the interlocking can differentiate between a track section occupied by the technician and occupied by a train. This allows the section meet the requirements of Clause 3.3.1 in an equivalent way to a physical isolation link. This has already been demonstrated for WESTRACE.</p> <p><b>Rationale</b> – the system architecture of other systems might not have a physical link and it also allows a link to be put on from a control centre rather than having to access the track.</p> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 4.1.13 Vandal Resistance Requirements (DER-150)

|                                                        |                                                                                                                                                                                                                                 |                |             |               |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Track-mounted and trackside equipment shall be secured using vandal resistant fixings to deter unauthorised access, with entry permitted by use of hand tools.                                                                  |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Whilst this is a mandatory requirement, the term 'vandal resistant' is subjective. The fittings for the wheel sensor are described in the attached document and email and comprise a bolt on a spring washer tightened to 200Nm |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Clarification that the clamp fitting is acceptable                                                                                                                                                                              |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                          | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L3/SIG/30082/005                                                                                                                                                                                                             | 3              | 08/03/2010  | 3.1.4.6       |
| <b>Variation applied for</b>                           | n/a                                                                                                                                                                                                                             |                |             |               |
| <b>Type of Variation</b>                               | No NC Needed                                                                                                                                                                                                                    |                |             |               |

|                       |                                                                                                                               |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>obtained</b>       |                                                                                                                               |
| <b>Applicability</b>  | National (Frauscher Axle Counters)                                                                                            |
| <b>Notes</b>          | After a query to the Signal Engineer's Helpline (SIG/INT/2011/128), it was determined a variation application was not needed. |
| <b>Future actions</b> | None                                                                                                                          |

#### 4.1.14 Wheel Sensor Configuration Parameters (DER-151)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |             |                   |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|-------------------|
| <b>Brief description of Current Practice/Process</b>   | RT/E/S/11752 Part E Clause 6.2 is one of many clauses that describes the Wheel Sensor Configuration Parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |             |                   |
| <b>Departures from Current Practice/Process</b>        | The Frauscher system cannot meet the requirements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |             |                   |
| <b>Reason for wanting to challenge the standard</b>    | Considering the date of this standard (August 2001), it possibly pre-dates AZLM technology and Frauscher cannot meet all its requirements. Are the requirements of this standard, and the detailed interface it describes, still valid or appropriate?                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |             |                   |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Version</b> | <b>Date</b> | <b>Clause</b>     |
|                                                        | RT/E/S/11752                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2              | 01/08/2001  | Part E Clause 6.2 |
| <b>Variation applied for</b>                           | Yes (Tracker 10463)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |                   |
| <b>Type of Variation obtained</b>                      | Variation Pending Standards Change (NC1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |             |                   |
| <b>Applicability</b>                                   | Modular Signalling Schemes (WRSL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |             |                   |
| <b>Notes</b>                                           | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |             |                   |
| <b>Future actions</b>                                  | <p>Since updating this Appendix, it was determined that the scope of the variation might not have been fully national and this was confirmed by the answer to Signal Engineer's Helpline 243.</p> <p>An extension to this certificate has been applied for under Tracker 13067 which is:</p> <p><b>Variation Pending Standards Change (NC1)</b><br/> <b>Geographic Scope</b> - National for all axle counter to interlocking interfaces on all resignalling schemes.<br/> <b>Rationale</b> – the standard requires review to take account of current and future technology and the ability of axle counters to interface with interlockings directly rather than through relay interfaces</p> |                |             |                   |

**4.1.15 Axle Counter Power Supply Requirements (DER-152)**

|                                                        |                                                                                                                               |                |             |                   |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|-------------------|
| <b>Brief description of Current Practice/Process</b>   | RT/E/S/11752 Part E Clause 7.1 describes the power supply arrangements                                                        |                |             |                   |
| <b>Departures from Current Practice/Process</b>        | The Frauscher system cannot meet the requirements                                                                             |                |             |                   |
| <b>Reason for wanting to challenge the standard</b>    | Requirements perceived to be to prescriptive and outdated                                                                     |                |             |                   |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                        | <b>Version</b> | <b>Date</b> | <b>Clause</b>     |
|                                                        | RT/E/S/11752                                                                                                                  | 2              | 01/08/2001  | Part E Clause 6.3 |
| <b>Variation applied for</b>                           | n/a                                                                                                                           |                |             |                   |
| <b>Type of Variation obtained</b>                      | No NC Needed                                                                                                                  |                |             |                   |
| <b>Applicability</b>                                   | National (Frauscher Axle Counters)                                                                                            |                |             |                   |
| <b>Notes</b>                                           | After a query to the Signal Engineer's Helpline (SIG/INT/2011/128), it was determined a variation application was not needed. |                |             |                   |
| <b>Future actions</b>                                  | None                                                                                                                          |                |             |                   |

**4.1.16 Preventing Technician's Controls Being Used To Reset an Axle Counter (DER-167)**

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                |                |             |               |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Operation of technician controls, e.g. to simulate an axle counter section occupied and cleared in the interlocking, shall not be capable of releasing aspect restriction.                                                                                                                                                                                                     |                |             |               |
| <b>Departures from Current Practice/Process</b>        | <p>Preventing Technician's controls being used to reset an axle counter cannot be achieved in SSI and SSI derivative interlockings without alteration to the operational program. WESTRACE is compliant as it sends back states separately.</p> <p>The previous practice in NR/GN/SIG/11900 will be followed and this is contained within the SSI DIS papers (112 and 114)</p> |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Not feasible with SSI technology                                                                                                                                                                                                                                                                                                                                               |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                         | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L2/SIG/30081                                                                                                                                                                                                                                                                                                                                                                | 1              | 05/09/2009  | 6.7.8         |
| <b>Variation applied for</b>                           | Yes (Tracker 10823)                                                                                                                                                                                                                                                                                                                                                            |                |             |               |
| <b>Type of Variation obtained</b>                      | Variation Pending Standards Change (NC1)                                                                                                                                                                                                                                                                                                                                       |                |             |               |
| <b>Applicability</b>                                   | National (SSI or derivative technology)                                                                                                                                                                                                                                                                                                                                        |                |             |               |
| <b>Notes</b>                                           | WESTRACE is compliant with the standard as the system can differentiate                                                                                                                                                                                                                                                                                                        |                |             |               |

|                       |                                                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------|
|                       | between track section occupancy by technician or by axle counter                                                            |
|                       | To make SSI compliant would require an operating system change                                                              |
| <b>Future actions</b> | Consideration might be given in the future as to whether this control is needed at all as it can be covered by instruction. |

#### 4.1.17 Compliance to NR/L3/SIG/30082/003 (FUT-29)

|                                                        |                                                                                             |                |             |               |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Axle counter data design to NR/L3/SIG/30082/003                                             |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Frauscher axle counter software does not fully meet the requirements of NR/L3/SIG/30082/003 |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Introduction of new technology                                                              |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                      | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L3/SIG/30082/003                                                                         | 1              | 04/12/2010  | Various       |
| <b>Variation applied for</b>                           | Yes (Tracker 12023)                                                                         |                |             |               |
| <b>Type of Variation obtained</b>                      | Variation Pending Standards Change (NC1)                                                    |                |             |               |
| <b>Applicability</b>                                   | National (All Signalling Systems)                                                           |                |             |               |
| <b>Notes</b>                                           | This was applied for under the Cardiff Area Signalling Renewals project (CASR/NC/118)       |                |             |               |
| <b>Future actions</b>                                  | None                                                                                        |                |             |               |

#### 4.1.18 Compliance to NR/L2/SIG/30081 (DER-178)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |             |               |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Axle Counter design to NR/L2/SIG/30081 (see attached document)                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |             |               |
| <b>Departures from Current Practice/Process</b>        | The Frauscher FAdC is currently undergoing product approval for use in the UK including both a.c. and d.c. electrified lines. The CASR project is the first installation to go live. As part of the development and PA processes it has become apparent that the current suite of axle counter standards is written around the specific features and requirements of the Thales system. The Frauscher FAdC complies with the intent of the standards but not the to letter of individual clauses. |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Use of Frauscher axle counters                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |             |               |

|                                   |                                                                                       |   |            |                          |
|-----------------------------------|---------------------------------------------------------------------------------------|---|------------|--------------------------|
|                                   | NR/L2/SIG/30081                                                                       | 1 | 05/09/2009 | 5.4.4<br>5.7.5<br>6.10.1 |
| <b>Variation applied for</b>      | Yes (Tracker 12021)                                                                   |   |            |                          |
| <b>Type of Variation obtained</b> | Variation Pending Standards Change (NC1)                                              |   |            |                          |
| <b>Applicability</b>              | National (All Signalling Systems)                                                     |   |            |                          |
| <b>Notes</b>                      | This was applied for under the Cardiff Area Signalling Renewals project (CASR/NC/117) |   |            |                          |
| <b>Future actions</b>             | None                                                                                  |   |            |                          |

#### 4.1.19 Re-Clearing Track Sections after Communications Loss (DER-179)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |             |               |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Once an affected axle counter section or sections have been set to 'Disturbed', they shall remain 'Disturbed' until successfully reset to 'Clear'                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |               |
| <b>Departures from Current Practice/Process</b>        | A non configurable feature of the Frauscher FAdC is the ability to re-clear a track section following communications loss. A HAZID elevated this as a non compliance as the interlocking cannot differentiate between communications loss and genuine track occupation                                                                                                                                                                                                                                                                                                                                      |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Frauscher Axle Counter technology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L3/SIG/30082/004                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1              | 06/03/2010  | 2.5.1         |
| <b>Variation applied for</b>                           | Yes (Tracker 12453)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |             |               |
| <b>Type of Variation obtained</b>                      | Variation Pending Standards Change (NC1) with conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |             |               |
| <b>Applicability</b>                                   | National (All Signalling Systems)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |               |
| <b>Notes</b>                                           | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |             |               |
| <b>Future actions</b>                                  | <p>The certificate conditions are:</p> <ol style="list-style-type: none"> <li>1. The Project shall monitor the reliability of the AEB communication link as part of the project FRACAS process. If the reliability of the link is found not to be as expected this shall be reported to the product acceptance specialist and the Professional Head.</li> <li>2. The current diagnostic tools are yet to be developed for this product. The failure mode identified within this application shall be considered during the development of these diagnostic tools and if practicable incorporated</li> </ol> |                |             |               |

|  |                                                                                                                                                                                                                                                                                                                                                                                           |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>within the next version of the product.</p> <p>Any Supplier or Project Team shall liaise with the Cardiff Area Signalling Renewals project to determine progress on these items (For Item 1 this is because a FRACAS process takes 2 years from commissioning and for Item 2, this is because the variation was accepted whilst the product acceptance process was still ongoing).</p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 4.1.20 Lack of Key Enabled Switch (DER-180)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |             |               |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | <p>A last count in override facility shall be provided for conditional and preparatory reset which shall:</p> <ul style="list-style-type: none"> <li>• be capable of being disabled in data;</li> <li>• take the form of a secure, one-shot device at the evaluator, operated by the maintainer and which forces the axle counter section status to 'Disturbed' when operated;</li> <li>• not be able to reset the axle counter section;</li> <li>• normally consist of a key enabled switch and button which require simultaneous operation.</li> </ul> |                |             |               |
| <b>Departures from Current Practice/Process</b>        | <p>From phase 2 onwards the CASR project will be implementing the reset data in line with HQ engineering preferred option. This enables the toggle switches for pre-reset (last count out override). This does not comply with the requirement for this to be operated using a key-enabled switch.</p>                                                                                                                                                                                                                                                   |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | <p>The Frauscher FAdC system is not equipped with a key enabled switch</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L3/SIG/30082/004                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1              | 06/03/2010  | 2.7.7         |
| <b>Variation applied for</b>                           | Yes (Tracker 12037)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |             |               |
| <b>Type of Variation obtained</b>                      | Variation Pending Standards Change (NC1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |             |               |
| <b>Applicability</b>                                   | National (All Signalling Systems)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |             |               |
| <b>Notes</b>                                           | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |             |               |
| <b>Future actions</b>                                  | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |             |               |

#### 4.1.21 Wheel Diameter and Distance between Centres (FUT-32)

|                                     |                                                                                        |
|-------------------------------------|----------------------------------------------------------------------------------------|
| <b>Brief description of Current</b> | <p>The axle counter system shall detect wheels of 350mm or more in diameter with a</p> |
|-------------------------------------|----------------------------------------------------------------------------------------|

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |             |               |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Practice/Process</b>                                | minimum distance between centres of 700mm travelling at speeds from 0 km/h to 300 km/h.                                                                                                                                                                                                                                                                                                                                                                                        |                |             |               |
| <b>Departures from Current Practice/Process</b>        | At 300kmph Frauscher requires a minimum wheel diameter of 600mm<br><br>Frauscher also only specified a max speed of 150kmph with the minimum 700mm distance between wheels.                                                                                                                                                                                                                                                                                                    |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Standard is over-specified                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L2/SIG/30082/004                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1              | 06/03/2010  | 2.5.3         |
| <b>Variation applied for</b>                           | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |             |               |
| <b>Type of Variation obtained</b>                      | No NC Needed                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |             |               |
| <b>Applicability</b>                                   | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |               |
| <b>Notes</b>                                           | <p>There does appear to be other European standards that conflict with NR/L2/SIG/30082/004.</p> <p>A Signal Engineer's Helpline Query (SIG/INT/2013/245) was sent in that came back saying that the CCS TSI should be used.</p> <p>In parallel, it was found out that the compliance with UK rolling stock had been reviewed as part of the Product Acceptance process and found not to be a problem.</p> <p>As the product has been accepted, then this closes the issue.</p> |                |             |               |
| <b>Future actions</b>                                  | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |               |

## 4.2 Control Centre

### 4.2.1 250 SEU Workstations (DER-25)

|                                                        |                                                                                                                                                     |                |             |               |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | There is a maximum of 5 monitors for overview and detail displays                                                                                   |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Potentially go up to 8 monitors or more                                                                                                             |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | To standardise the Modular Workstation at a potentially greater number to allow a standard workstation that can have an area of control of 250 SEUs |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                              | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/SP/SIG/10067                                                                                                                                     | 2              | Aug-03      | 6.1.1 a)      |

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Variation applied for</b>      | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Type of Variation obtained</b> | No NC Needed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Applicability</b>              | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Notes</b>                      | <p>A derogation, NR/SP/SIG/10067 was not applied for because:</p> <ol style="list-style-type: none"> <li>1. Both Modular Pilots were compliant</li> <li>2. The concept of a Modular Workstation has been overtaken by NOS. A Workstation would be provided which might not solely cover Modular routes but would have an area of control that would contain both Modular and Conventionally signalled routes based on railway geography.</li> <li>3. The current practice imposes a limit on viewing angle measured in monitor number based on the monitor technology at the time. The primary standard for viewing angles is NR/SP/ERG/00005 which is what a workstation should be designed to. The use of monitor numbers as a unit for viewing angle could lead to the ergonomic guidelines being breached by using large and/or wide monitors.</li> </ol> |
| <b>Future actions</b>             | <p>None.</p> <p>There are no future actions for Modular as the issues of workstation size and viewing angle would be resolved by the NOS project. Ergonomic input into that process would determine if the viewing angles could be increased.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

#### 4.2.2 250 SEU Workstations (DER-26)

|                                                        |                                                                                                                                                     |                |             |               |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | There is a maximum of 6 monitors including peripheral displays                                                                                      |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Potentially go up to 8 monitors or more                                                                                                             |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | To standardise the Modular Workstation at a potentially greater number to allow a standard workstation that can have an area of control of 250 SEUs |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                              | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/SP/SIG/10067                                                                                                                                     | 2              | Aug-03      | 8.2.2.2       |
| <b>Variation applied for</b>                           | n/a                                                                                                                                                 |                |             |               |
| <b>Type of Variation obtained</b>                      | No NC Needed                                                                                                                                        |                |             |               |

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Applicability</b>  | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Notes</b>          | <p>A derogation, NR/SP/SIG/10067 was not applied for because:</p> <ol style="list-style-type: none"> <li>Both Modular Pilots were compliant</li> <li>The concept of a Modular Workstation has been overtaken by NOS. A Workstation would be provided which might not solely cover Modular routes but would have an area of control that would contain both Modular and Conventionally signalled routes based on railway geography.</li> <li>The current practice imposes a limit on viewing angle measured in monitor number based on the monitor technology at the time. The primary standard for viewing angles is NR/SP/ERG/00005 which is what a workstation should be designed to. The use of monitor numbers as a unit for viewing angle could lead to the ergonomic guidelines being breached by using large and/or wide monitors.</li> </ol> |
| <b>Future actions</b> | <p>None.</p> <p>There are no future actions for Modular as the issues of workstation size and viewing angle would be resolved by the NOS project. Ergonomic input into that process would determine if the viewing angles could be increased and additional peripheral displays could be provided based on having a fully automated workstation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

#### 4.2.3 Headers on TD Messages (DER-27)

|                                                        |                                                                                                                                                           |                |             |               |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Requirement for Small TDs at Fringe SBs to allow them to work over FTN rather than a Slave Unit (Slave Units cannot have headers attached to the message) |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Not use headers over FTN - risk might be acceptable or use of Path Trace might mitigate                                                                   |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Hardware cost of Small TDs                                                                                                                                |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                    | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | TI 101                                                                                                                                                    | 2              | Dec-08      | All           |

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Variation applied for</b>      | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Type of Variation obtained</b> | No NC Needed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Applicability</b>              | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Notes</b>                      | No variation was sought as both suppliers confirmed compliance for the pilot projects.                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Future actions</b>             | <p>The consideration of a Small TD over a Slave Unit would only be a consideration when the fringe signal box has no TD system. Over time, as NOS progresses, it is more likely that a Modular Signalling scheme will fringe to somewhere with a TD (separate or integrated into a Control System).</p> <p>The safety argument for sending TD information without headers over FTN was previously rejected as part of the approvals for the Ferrybridge Knottingley Resignalling Project.</p> |

#### 4.2.4 Emergency Alarms (DER-44)

|                                                        |                                                                                                                                                                                                                                                                             |                |             |               |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Emergency alarms to be hard wired between SBs (or FDM transmission used) in a route diverse to that of the voice communications between the SBs.                                                                                                                            |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Have the emergency alarms on the VSCS (allowable by other standards) with transmission via FTN                                                                                                                                                                              |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Less hardware and the ability to reconfigure and re-control workstations                                                                                                                                                                                                    |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                      | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | SSI8500 F                                                                                                                                                                                                                                                                   | 4              | Oct-05      | 4             |
| <b>Variation applied for</b>                           | n/a                                                                                                                                                                                                                                                                         |                |             |               |
| <b>Type of Variation obtained</b>                      | No NC Needed                                                                                                                                                                                                                                                                |                |             |               |
| <b>Applicability</b>                                   | National (All Signalling Systems)                                                                                                                                                                                                                                           |                |             |               |
| <b>Notes</b>                                           | Both Pilot Schemes confirmed compliance. The requirements for emergency alarms are not expressed in standards (SSI8500 F only applies to SSI schemes) but instead in Product Acceptance Certificate PA05/02893/P (Confirmed by Signal Engineer's Helpline SIG/INT/2011/077) |                |             |               |
| <b>Future actions</b>                                  | None                                                                                                                                                                                                                                                                        |                |             |               |

#### 4.2.5 IECC Scalable Alarms (DER-144)

|                                                      |                                                                                       |
|------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Brief description of Current Practice/Process</b> | <p>Mandatory Functional Requirements</p> <p>6.3.8 I) alarm if a signal returns to</p> |
|------------------------------------------------------|---------------------------------------------------------------------------------------|

|                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                 | <p>danger unexpectedly</p> <p>6.6.5 Separate "play back" system</p> <p>6.6.6 Form based Signaller's logs</p> <p>Testing &amp; Commissioning</p> <p>12.3.1 The processes used for data preparation shall ensure that rapid amendments, with appropriate security arrangements, can be made and tested 'off-line' on site.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Departures from Current Practice/Process</b> | <p>Mandatory Functional Requirements</p> <p>6.3.8 I) Standard Signaller's alarms shall be data configurable and include -<br/>I) alarms if a signal returns to danger unexpectedly, i.e. not caused by train movement or Signaller's action. <b>This function is not provided as it is not possible to determine "unexpected" signal reversion to danger.</b></p> <p>6.6.5 A separate system should be provided which can play back, in 'real' &amp; 'fast play' time, the events as recorded by the VSCS. It shall be possible to search and quickly access specified time periods or event sequences. <b>Feature is not currently provided by IECC Scalable.</b></p> <p>6.6.6 Form based Signaller's logs should be built into the VSCS with appropriate access / editing / printing facilities. Where possible, the form entries should be automatically completed (e.g. date and time) with manual editing allowed if required. The exact nature of the forms should be data configurable dependent on the specific application. Where there is a dependency relationship between a form and an inhibit/reminder device the system should provide a link between them, e.g. where a form is to be filled in before removal of protection arrangements. <b>Feature is not currently provided by IECC Scalable.</b></p> |

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |             |                                   |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|-----------------------------------|
|                                                        | <p>Testing &amp; Commissioning</p> <p>12.3.1 The processes used for data preparation shall ensure that rapid amendments, with appropriate security arrangements, can be made and tested 'off-line' on site. While the data preparation process is improved to provide rapid amendments it is not possible to make changes to data and test the changes on site in an "off-line" environment. <b>This is not supported by IECC Scalable architecture</b></p> |                |             |                                   |
| <b>Reason for wanting to challenge the standard</b>    | IECC Scalable Version 1 replicates existing IECC Classic functionality (in compliance with NR/SP/SIG/17504) on a new hardware platform. It incorporates the proven DIS signaller interface functionality and symbols that are used in existing IECC Upgrade 004 installations, and making changes would introduce risk with no benefit.                                                                                                                     |                |             |                                   |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Version</b> | <b>Date</b> | <b>Clause</b>                     |
|                                                        | NR/SP/SIG/10067                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2              | Aug-03      | 6.3.8<br>6.6.5<br>6.6.6<br>12.3.1 |
| <b>Variation applied for</b>                           | Yes (Tracker 9897)                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |             |                                   |
| <b>Type of Variation obtained</b>                      | Withdrawn                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |             |                                   |
| <b>Applicability</b>                                   | National (IECC Scalable)                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |             |                                   |
| <b>Notes</b>                                           | The requirements were discussed with the Head of Signalling and withdrawn from the product acceptance requirements thereby negating the need for a derogation.                                                                                                                                                                                                                                                                                              |                |             |                                   |
| <b>Future actions</b>                                  | None for IECC Scalable version 1. Future upgrades would need to comply with the product acceptance requirements laid down for the upgrade.                                                                                                                                                                                                                                                                                                                  |                |             |                                   |

#### 4.2.6 IECC Scalable Symbols (DER-145)

|                                                      |                                                                                                                                                                                      |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Brief description of Current Practice/Process</b> | <p>Mandatory Functional Requirements</p> <p>6.1.2 a Display of points</p> <p>6.1.13 c Train Descriptions</p> <p>Appendix A – Symbols</p> <p>26 Signal with limited clearance for</p> |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                 | <p>driver on SPT</p> <p>30 Banner Repeater</p> <p>36 Absolute Block Working</p> <p>73 Signalling Control Centre</p> <p>12 Isolated Exit Facility</p> <p>40 Inhibit/Reminder: Single application</p> <p>41 Inhibit/Reminder: Double application</p> <p>63 SPAD Alarm Inhibit applied</p> <p>44 Traction Isolation Reminder</p> <p>45 Blocked to Electric Traction Reminder</p> <p>46 Engineer's Possession Reminder</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Departures from Current Practice/Process</b> | <p>Mandatory Functional Requirements</p> <p>6.1.2 a point indications shall - a) on detail displays, when individual points are controlled, display an N (Normal) or R (Reverse) next to the points. The letter shall flash until the points correspond with the demand. In IECC Scalable Version 1 the points flash rather than the letter</p> <p>6.1.13 c train descriptions shall - c) be able to show 5 characters. IECC Scalable Version 1 accepts 4 character Train Descriptions only</p> <p>Appendix A - Symbols</p> <p>The following symbols cannot be drawn in IECC Scalable Version 1</p> <p>26 Signal with limited clearance for driver on SPT</p> <p>30 Banner Repeater</p> <p>73 Signalling Control Centre</p> <p>The following symbols are not drawn by Scalable V1 exactly as specified in 10067</p> <p>12 Isolated Exit Facility - There is an additional space between the end of the track circuited section and the exit symbol</p> <p>40 Inhibit/Reminder: Single application - The Inhibit/Reminder does not fully cover the post and</p> |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                |                                                                                                                                                                                                                                                                              |             |                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | signal and is drawn "double height" on the detail view. This is to allow for the application of, and alignment with, any SPAD Alarm Inhibit that may be applied to the signal. |                                                                                                                                                                                                                                                                              |             |                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 41                                                                                                                                                                             | Inhibit/Reminder: Double application - The Inhibit/Reminder does not fully cover the post and signal and is drawn "double height" on the detail view. This is to allow for the application of, and alignment with, any SPAD Alarm Inhibit that may be applied to the signal. |             |                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 63                                                                                                                                                                             | SPAD Alarm Inhibit applied - Yellow background does not fully cover the post and is drawn "double height" on the detail view. This is to allow for alignment with inhibit and isolation reminders that may be applied to the signal.                                         |             |                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | The symbol for DC traction is not drawn by Scalable V1 for the following circumstances                                                                                         |                                                                                                                                                                                                                                                                              |             |                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 44                                                                                                                                                                             | Traction Isolation Reminder                                                                                                                                                                                                                                                  |             |                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 45                                                                                                                                                                             | Blocked to Electric Traction Reminder                                                                                                                                                                                                                                        |             |                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 46                                                                                                                                                                             | Engineer's Possession Reminder                                                                                                                                                                                                                                               |             |                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Reason for wanting to challenge the standard</b>                                                                                                                            |                                                                                                                                                                                                                                                                              |             |                              |
| IECC Scalable Version 1 replicates existing IECC Classic functionality (in compliance with NR/SP/SIG/17504) on a new hardware platform. It incorporates the proven DIS signaller interface functionality and symbols that are used in existing IECC Upgrade 004 installations, and making changes would introduce risk with no benefit. There are currently no planned installations that include requirements for the symbols that cannot be drawn in Scalable V1 and no immediate requirement for 5-character Train Descriptions. |                                                                                                                                                                                |                                                                                                                                                                                                                                                                              |             |                              |
| <b>Derogation identified to a particular Standard?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Standard Number</b>                                                                                                                                                         | <b>Version</b>                                                                                                                                                                                                                                                               | <b>Date</b> | <b>Clause</b>                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | NR/SP/SIG/10067                                                                                                                                                                | 2                                                                                                                                                                                                                                                                            | Aug-03      | 6.1 and Appendix A - Symbols |
| <b>Variation applied for</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Yes (Tracker 9898)                                                                                                                                                             |                                                                                                                                                                                                                                                                              |             |                              |

|                                   |                                                                                                                                                                |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type of Variation obtained</b> | Withdrawn                                                                                                                                                      |
| <b>Applicability</b>              | National (IECC Scalable)                                                                                                                                       |
| <b>Notes</b>                      | The requirements were discussed with the Head of Signalling and withdrawn from the product acceptance requirements thereby negating the need for a derogation. |
| <b>Future actions</b>             | None for IECC Scalable version 1. Future upgrades would need to comply with the product acceptance requirements laid down for the upgrade.                     |

#### 4.2.7 IECC Scalable Compliance with NR/PS/SIG/00012 (DER-146)

|                                                        |                                                                                                                                                                                                                                                                             |                |             |               |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | The DIS software used in IECC Scalable is 'ported' from IECC Classic and is not compliant with the Train Describer Specification (NR/PS/SIG/00012) in a number of areas.                                                                                                    |                |             |               |
| <b>Departures from Current Practice/Process</b>        | A clause by clause review of compliance has not been undertaken. The DIS software used in IECC Scalable was developed to meet the Train Describer Specification defined by the British Railways Board, ref:BR800, dated October 1985                                        |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | IECC Scalable Version 1 replicates existing IECC Classic functionality on a new hardware platform and incorporates the proven Train Describer functionality that is used in all IECC Classic installations since 1989. Making changes would introduce risk with no benefit. |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                      | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | RT/E/PS/00012                                                                                                                                                                                                                                                               | 1              | 01/08/2001  | Various       |
| <b>Variation applied for</b>                           | Yes (Tracker 9899)                                                                                                                                                                                                                                                          |                |             |               |
| <b>Type of Variation obtained</b>                      | Withdrawn                                                                                                                                                                                                                                                                   |                |             |               |
| <b>Applicability</b>                                   | National (IECC Scalable)                                                                                                                                                                                                                                                    |                |             |               |
| <b>Notes</b>                                           | The requirements were discussed with the Head of Signalling and withdrawn from the product acceptance requirements thereby negating the need for a derogation.                                                                                                              |                |             |               |
| <b>Future actions</b>                                  | None for IECC Scalable version 1. Future upgrades would need to comply with the product acceptance requirements laid down for the upgrade.                                                                                                                                  |                |             |               |

#### 4.2.8 IECC Scalable Compliance to ARS Specification (NR/L3/SIG/10120 (DER-147))

|                             |                                        |
|-----------------------------|----------------------------------------|
| <b>Brief description of</b> | The ARS software used in IECC Scalable |
|-----------------------------|----------------------------------------|

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |             |               |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Current Practice/Process</b>                        | <p>is not compliant with the ARS Specification (NR/L3/SIG/10120) in a number of areas.</p> <p>These are defined in the IECC Upgrade 4 document "Compliance of ARS Upgrade 004 with NR/L3/SIG/10120" (Ref: SCS-UG4-RP-20, Issue 1, 10 Nov 2010).</p>                                                                                                                                                                                                                                                                                                   |                |             |               |
| <b>Departures from Current Practice/Process</b>        | <p>See the IECC Upgrade 4 document "Compliance of ARS Upgrade 004 with NR/L3/SIG/10120" (Ref: SCS-UG4-RP-20, Issue 1, 10 Nov 2010) for the complete list of variations to the 10120 standard.</p>                                                                                                                                                                                                                                                                                                                                                     |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | <p>IECC Scalable Version 1 replicates existing IECC Upgrade 004 functionality on a new hardware platform and incorporates the proven ARS functionality that is used in all IECC Classic installations.</p> <p>A parallel project "Enhanced ARS" will deliver an upgrade to IECC ARS compliant with 10120, but this will not be available in time for the first IECC Scalable applications. The benefits of early product acceptance of IECC Scalable to Network Rail mean that a delay to incorporate Enhanced ARS is not reasonably practicable.</p> |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L3/SIG/10120                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1              | 01/06/2008  | Various       |
| <b>Variation applied for</b>                           | Yes (Tracker 9900)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |             |               |
| <b>Type of Variation obtained</b>                      | <p>Temporary Variation (NC1) with conditions</p> <p>Expiry Date <b>31<sup>st</sup> January 2014</b></p> <p>Subsequently Withdrawn</p>                                                                                                                                                                                                                                                                                                                                                                                                                 |                |             |               |
| <b>Applicability</b>                                   | <p>Whilst this was an NC1, the certificate conditions limited it originally to Ely to Norwich Modular signalling, Harrogate re-signalling and Swindon re-lock projects. These were the only IECC Scalable installations which would have Version 1 of the product installed. After the submission of SIG/INT/2012/184, the applicability is now only to TVSC.</p>                                                                                                                                                                                     |                |             |               |
| <b>Notes</b>                                           | <p>After it became clear that there was no action plan to close the TNC at Harrogate and Cambridge IECCs, due to a lack of active projects that would have forced an</p>                                                                                                                                                                                                                                                                                                                                                                              |                |             |               |

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|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | update to a higher version of IECC Scalable, a helpline query (SIG/INT/2012/184) was submitted and the TNC was withdrawn as far as Cambridge and Harrogate IECCs was concerned.                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Future actions</b> | <p>The original certificate conditions were:</p> <p>Subject to the retrofit of new software at the next change and limited to the sites specified (Ely to Norwich ModSig, Harrogate re-signalling and Swindon re-lock projects)</p> <p>As the concept of a Modular Workstation has been superseded by NOS, a Modular Signalling scheme could be a part of a workstation that could be controlling conventionally signalled lines. This workstation would have to comply with the product acceptance requirements at the time of its installation.</p> |

### 4.3 Design Process

#### 4.3.1 Provision of Control Tables (DER-11)

|                                                        |                                                                                                                                                                                                                                                                                   |                |             |               |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Provision of Control Tables                                                                                                                                                                                                                                                       |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Have a record of the interlocking logic and a separate record of the site configuration (features selected)                                                                                                                                                                       |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Whether control tables should be an input into the interlocking design process or an output from it.                                                                                                                                                                              |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                            | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L3/SIG/11202                                                                                                                                                                                                                                                                   | 4              | 07/03/2009  | 1             |
| <b>Variation applied for</b>                           | n/a                                                                                                                                                                                                                                                                               |                |             |               |
| <b>Type of Variation obtained</b>                      | No Application                                                                                                                                                                                                                                                                    |                |             |               |
| <b>Applicability</b>                                   | None                                                                                                                                                                                                                                                                              |                |             |               |
| <b>Notes</b>                                           | <p>No formal Variation applied for although the issue was discussed with the Professional Head Team 26<sup>th</sup> February 2010 and would not have been supported.</p> <p>The current requirement is detailed within NR/L2/SIG/11201 Module A18 Issue 6 04/06/2011 Clause 1</p> |                |             |               |
| <b>Future actions</b>                                  | This issue could be potentially reviewed for Pilot or Future schemes but would require a robust proposal from the                                                                                                                                                                 |                |             |               |

|  |                        |
|--|------------------------|
|  | Suppliers/Project Team |
|--|------------------------|

## 4.3.2 Stageworks Design (DER-29)

|                                                        |                                                                                                                                                                                                                                                             |                |             |               |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Separate design for each stage                                                                                                                                                                                                                              |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Not to have separate design for each stage                                                                                                                                                                                                                  |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Cost Reduction                                                                                                                                                                                                                                              |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                      | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/SP/SIG/11201                                                                                                                                                                                                                                             | 3              | 06/12/2003  | 15.3          |
| <b>Variation applied for</b>                           | n/a                                                                                                                                                                                                                                                         |                |             |               |
| <b>Type of Variation obtained</b>                      | No NC Needed                                                                                                                                                                                                                                                |                |             |               |
| <b>Applicability</b>                                   | None                                                                                                                                                                                                                                                        |                |             |               |
| <b>Notes</b>                                           | <p>The current requirement is detailed within NR/L2/SIG/11201 Issue 8 02/06/2012 Clause 15.3.</p> <p>This issue was not taken forward as a derogation for the SSL and Invensys Pilot Schemes and they were compliant whenever stagework was undertaken.</p> |                |             |               |
| <b>Future actions</b>                                  | To be reconsidered for Future schemes (tied in with 7.11.1)                                                                                                                                                                                                 |                |             |               |

## 4.3.3 Checking Differences from a Typical or Standard Design Rather Than Full 100% Check of Design (Invensys) (DER-56, FUT-24)

|                                                        |                                                                                                                                                                                                                                                                                              |                |             |               |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Full review of data/design rather than differences from a typical or standard design                                                                                                                                                                                                         |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Any designs copied from a source design (otherwise termed the Copy Design) will not follow the full design process as specified by this standard. It is proposed to verify only the differences between a copy design and its source, as well as reducing RDE reviews and client acceptances |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | To reduce the design/checking workload, employ resources on conceptual designs and cut costs                                                                                                                                                                                                 |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                       | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L2/SIG/11201                                                                                                                                                                                                                                                                              | 7              | 03/09/2011  | 8.3           |
|                                                        | NR/L2/SIG/11201                                                                                                                                                                                                                                                                              | 4              | 04/06/2011  | 1.3           |
|                                                        | Mod A21                                                                                                                                                                                                                                                                                      |                |             |               |
| <b>Variation applied for</b>                           | n/a                                                                                                                                                                                                                                                                                          |                |             |               |
| <b>Type of Variation obtained</b>                      | No NC Needed                                                                                                                                                                                                                                                                                 |                |             |               |
| <b>Applicability</b>                                   | National (WESTRACE)                                                                                                                                                                                                                                                                          |                |             |               |
| <b>Notes</b>                                           | This derogation has evolved to become                                                                                                                                                                                                                                                        |                |             |               |

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                             |                |             |               |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
|                       | the one for the use of the Configuration Drawing process for Invensys external equipment (OC Housings and MEH).                                                                                                                                                                                                                                                                                                             |                |             |               |
|                       | It was previously identified to the below standards but the application is now as per the above entry.                                                                                                                                                                                                                                                                                                                      |                |             |               |
|                       | A derogation to GK/RT0207 is not required as it has now been withdrawn.                                                                                                                                                                                                                                                                                                                                                     |                |             |               |
|                       | After a meeting on 28/9/2012, a query to the Signal Engineer's Helpline was submitted, in the form of a draft Tracker Form, and the answered query (SIG/INT/2012/192) confirmed that the process was not non-compliant.                                                                                                                                                                                                     |                |             |               |
|                       | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                       | NR/SP/SIG/11201                                                                                                                                                                                                                                                                                                                                                                                                             | 3              | 06/12/2003  | 8.3           |
|                       | RT/E/C/11701                                                                                                                                                                                                                                                                                                                                                                                                                | 3              | 06/12/2003  | Part E 1.3    |
|                       | GK/RT0207                                                                                                                                                                                                                                                                                                                                                                                                                   | 1              | Aug-00      |               |
| <b>Future actions</b> | <p>Whilst the process itself is not non-compliant, there are a number of issues, picked up from the 28/9/2012 meeting (in orange text in the draft Tracker Form) that need to be finalised namely:</p> <ul style="list-style-type: none"> <li>Whilst not raised at the 28/9/2012 meeting, it is not clear how the standard drawings are approved and whether there needs to be an internal governance structure.</li> </ul> |                |             |               |

#### 4.3.4 Full, Traditional Design (DER-57)

|                                                        |                                                                                                                                                                                                                                      |                |             |                  |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|------------------|
| <b>Brief description of Current Practice/Process</b>   | Design produced to NR/GN/SIG/11701 including the full, traditional suite of drawings                                                                                                                                                 |                |             |                  |
| <b>Departures from Current Practice/Process</b>        | Types of Design Drawings supplied Design will not conform to this standard. One of Modular Signalling initiatives will be to reduce the number of drawings produced (new works only) within the detailed design phase of the project |                |             |                  |
| <b>Reason for wanting to challenge the standard</b>    | To reduce the design/checking workload, employ resources on conceptual designs and cut costs                                                                                                                                         |                |             |                  |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                               | <b>Version</b> | <b>Date</b> | <b>Clause</b>    |
|                                                        | NR/GN/SIG/11701                                                                                                                                                                                                                      | 3              | 06/12/2003  | Part B<br>Part N |

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| <b>Variation applied for</b>      | Yes (Tracker 8758)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Type of Variation obtained</b> | Derogation (NC1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Applicability</b>              | Modular Signalling Schemes (All)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Notes</b>                      | The current requirement is detailed within NR/L2/SIG/11201 Module A2 Issue 5 03/09/2011 (Whole Module). The derogation granted is not reflected in the current standard and this has been pointed out to the Professional Head.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Future actions</b>             | <p>None for project teams (Modular Signalling Schemes only)</p> <p>The Standard Owner (Professional Head) needs to ensure the derogation is captured within a future reissue of NR/L2/SIG/11201 Module A2</p> <p>An extension to this certificate has been applied for under Tracker 13768 which is:</p> <p><b>Derogation (NC1)</b><br/> <b>Geographic Scope</b> - This application is national for Invensys schemes using WESTRACE interlockings and object controllers, regardless of whether the scheme is considered conventional or has been designated as a Modular Signalling Scheme.<br/> This application is national for SSL schemes using SSL Modular Signalling technology for schemes designated as Modular Signalling only.<br/> <b>Rationale</b> – It is appropriate to extend the concept for schemes using WESTRACE interlockings and object controllers as the differences in complexity and traffic level between a conventional and modular signalled do not vary the technology or how it is applied. Use is made of standard factory built equipment, plug coupled interconnects, etc which make the on site assembly and maintenance of the system simpler.</p> |

#### 4.3.5 Scaled Location Plans (DER-58, DER-59)

|                                                      |                                 |
|------------------------------------------------------|---------------------------------|
| <b>Brief description of Current Practice/Process</b> | Scale Location Area Plans       |
| <b>Departures from Current Practice/Process</b>      | Dimensioned Location Area Plans |

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|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Reason for wanting to challenge the standard</b>    | Cost and practicality                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L2/SIG/11201 Mod A15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4              | 04/06/2011  | 3d            |
|                                                        | NR/L2/SIG/11201 Mod A2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 5              | 03/09/2011  | 4.1           |
| <b>Variation applied for</b>                           | Yes (Tracker 8756 (Invensys only) superseded by Tracker 10817 for both suppliers)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |             |               |
| <b>Type of Variation obtained</b>                      | Derogation (NC1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |             |               |
| <b>Applicability</b>                                   | Modular Signalling Schemes (All)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |             |               |
| <b>Notes</b>                                           | <p>Originally, this was for Invensys only and their Trackside Equipment Schematic and was regularised under Tracker 8756 against NR/GN/SIG/11701 Issue 3, 06/12/2003, Part M Clause 3 d) and Part N Clause 4.1 (Clause 5 of RT/E/S/11201).</p> <p>It became apparent, after the derogation was granted, that SSL now needed this. An application for both suppliers was made under Tracker 10817.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |             |               |
| <b>Future actions</b>                                  | <p>None for project teams (Modular Signalling Schemes only)</p> <p>The Standard Owner (Professional Head) needs to ensure the derogation is captured within a future reissue of NR/L2/SIG/11201 Modules A2 and A15.</p> <p>An extension to this certificate has been applied for under Tracker 13937 which is:</p> <p><b>Derogation (NC1)</b><br/> <b>Geographic Scope</b> - This application is national for Invensys schemes using WESTRACE interlockings and object controllers, regardless of whether the scheme is considered conventional or has been designated as a Modular Signalling Scheme.<br/> This application is national for SSL schemes using SSL Modular Signalling technology for schemes designated as Modular Signalling only.<br/> <b>Rationale</b> – A dimensioned drawing will be of more use to the maintainer who would not use a scale rule on site but is concerned with the distances between</p> |                |             |               |

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|  | <p>equipment, from pedestrian and vehicular access points (which are detailed) and the relative position of equipment to each other.</p> <p>The TES, whilst showing dimensioned OC Housings and having axle counter head 'mileages' is not the reference drawing for the positioning of equipment on site. This remains the signalling scheme plan which shows the dimensions and distances for signals, AWS, etc.</p> |
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#### 4.3.6 Separate Index Sheets (DER-60)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |                      |
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| <b>Brief description of Current Practice/Process</b>   | Separate Index Sheets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |             |                      |
| <b>Departures from Current Practice/Process</b>        | Have an index box on the front sheet of the Object Controller drawings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |             |                      |
| <b>Reason for wanting to challenge the standard</b>    | Cost Reduction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |             |                      |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Version</b> | <b>Date</b> | <b>Clause</b>        |
|                                                        | NR/GN/SIG/11701                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3              | 06/12/2003  | Part K 2.1, 2.3, 2.5 |
| <b>Variation applied for</b>                           | Yes (Tracker 8770)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |             |                      |
| <b>Type of Variation obtained</b>                      | Derogation (NC1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |             |                      |
| <b>Applicability</b>                                   | Modular Signalling Schemes (WRSL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |             |                      |
| <b>Notes</b>                                           | <p>The current requirement is detailed within NR/L2/SIG/11201 Module A10 Issue 4 04/06/2011 Clauses 2.1, 2.3, 2.5. The derogation granted is not reflected in the current standard and this has been pointed out to the Professional Head.</p>                                                                                                                                                                                                                                                                                                                                            |                |             |                      |
| <b>Future actions</b>                                  | <p>None for project teams (Modular Signalling Schemes only)</p> <p>The Standard Owner (Professional Head) needs to ensure the derogation is captured within a future reissue of NR/L2/SIG/11201 Module A10</p> <p>An extension to this certificate has been applied for under Tracker 13938 which is:</p> <p><b>Derogation (NC1)</b><br/> <b>Geographic Scope</b> - This application is national for Invensys schemes using WESTRACE interlockings and object controllers, regardless of whether the scheme is considered conventional or has been designated as a Modular Signalling</p> |                |             |                      |

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|  | <p>Scheme.</p> <p><b>Rationale</b> – As the same architecture and process is used for this equipment, when employed on a conventional scheme, then it is appropriate to extend this derogation. The concept is the same and independent of the differences in complexity and traffic level between a conventional and modular signalled railway.</p> |
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#### 4.3.7 Point Detection Contact Symbols (DER-61)

|                                                        |                                                                                                                                                                                                                                                                                                                                                            |                |             |               |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Use of symbols to depict normal and reverse detection contacts                                                                                                                                                                                                                                                                                             |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Use of LH and RH to allow standard drawings based on the contact made and opened when the points are in a LHSC or RHSC configuration                                                                                                                                                                                                                       |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Reduced design effort in assigning contacts to be N and R. Reduced cost and chance for design error therefore reduced need for checking.                                                                                                                                                                                                                   |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                     | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | RT/E/C/11205                                                                                                                                                                                                                                                                                                                                               | 1              | Aug-00      | A4            |
| <b>Variation applied for</b>                           | Yes (Tracker 8853)                                                                                                                                                                                                                                                                                                                                         |                |             |               |
| <b>Type of Variation obtained</b>                      | Derogation (NC1)                                                                                                                                                                                                                                                                                                                                           |                |             |               |
| <b>Applicability</b>                                   | Modular Signalling Schemes (WRSL)                                                                                                                                                                                                                                                                                                                          |                |             |               |
| <b>Notes</b>                                           | <p>The current requirement is detailed within NR/L2/SIG/11201 Module A19 Issue 4 04/06/2011 Clause 2 (page 8). The derogation granted is not reflected in the current standard and this has been pointed out to the Professional Head.</p> <p>This issue is related to 4.3.8 (Tracker 7801).</p> <p>To progress this, a HAZID was required to be held.</p> |                |             |               |
| <b>Future actions</b>                                  | <p>None for project teams</p> <p>The Standard Owner (Professional Head) needs to ensure the derogation is captured within a future reissue of NR/L2/SIG/11201 Module A19</p>                                                                                                                                                                               |                |             |               |

#### 4.3.8 Use of LHSC/RHSC on Trackside Drawings (DER-62)

|                                                      |                                                             |
|------------------------------------------------------|-------------------------------------------------------------|
| <b>Brief description of Current Practice/Process</b> | Trackside drawings show point positions as Normal & Reverse |
|------------------------------------------------------|-------------------------------------------------------------|

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|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Departures from Current Practice/Process</b>        | Use LHSC/RHSC for all trackside drawings/markings. Normal/reverse used in interlocking controls and all indications to the signaller and operator                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | The connection of points to the controlling equipment is unrelated to the labelling of normal & reverse positions, as both the driving mechanism and the control circuitry are configured by which switch is closed. By changing the nomenclature on the object controller drawings to LHSC/RHSC instead of N/R, designs, drawings, labelling, and connections can all be standardised leading to a reduced cost and chance for design error therefore reduced need for checking.                                                                                                          |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/L2/SIG/11704                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2              | 05/06/2010  | 3             |
| <b>Variation applied for</b>                           | Yes (Tracker 7801)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |             |               |
| <b>Type of Variation obtained</b>                      | Derogation (NC1) (no conditions on the certificate but the HAZID report details conditions)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |             |               |
| <b>Applicability</b>                                   | I Modular Signalling Schemes (WRSL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |             |               |
| <b>Notes</b>                                           | <p>This issue is related to 4.3.7 (Tracker 8853) and 4.3.10 (Tracker 8751).</p> <p>To progress this, a HAZID was required to be held.</p> <p>Additionally, a proposal to put LHSNC and RHSNC on the front of the configuration drawings was made.</p>                                                                                                                                                                                                                                                                                                                                      |                |             |               |
| <b>Future actions</b>                                  | <p>Project Teams need to note the following conditions which are part of Conclusion 1 of the HAZID Report:</p> <ol style="list-style-type: none"> <li>1. The configuration drawings for Object Controller (Points) must state whether LHSC refers to Normal or Reverse, etc.</li> <li>2. A label shall be affixed to the Object Controller (Points) case to state whether LHSC refers to Normal or Reverse, etc.</li> <li>3. A proposal is made as to whether the points record cards (NR/L3/SIG/10663 Appendix R) are amended or a new one is produced for Modular Signalling.</li> </ol> |                |             |               |

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|  | <p>4. Training courses need to explicitly state the use of LHSC/RHSC nomenclature</p> <p>5. The LHSC/RHSC nomenclature needs to be explicitly stated during the Asset Management Plan process</p> <p>6. Point barring must take place with the use of Normal/Reverse nomenclature only.</p> |
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#### 4.3.9 Redundant Data (DER-66)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |             |               |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | Provision of redundant data to permit standard generic layouts with features selectable by hardware or software switches                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Redundant Data – Permit the existence of redundant data within an interlocking to eliminate bespoke data creation for each scheme.                                                                                                                                                                                                                                                                                                                                                                                                                               |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Cost reduction from not having to write bespoke data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/SP/SIG/11201                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3              | 06/12/2003  | 15.4          |
| <b>Variation applied for</b>                           | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |             |               |
| <b>Type of Variation obtained</b>                      | No NC Needed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |             |               |
| <b>Applicability</b>                                   | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |             |               |
| <b>Notes</b>                                           | <p>SSL would have had this if their original proposals to design an interlocking, with switches to select for layouts, were followed. However, this is not now happening. Therefore, no redundant data will be present.</p> <p>The construction of WESTRACE data means that there will be no redundant data within the interlocking but some might be left in after staging.</p> <p>Confirmation has been received from Invensys that this related to redundant wiring within the OC(S) but no standard can be found which this is against therefore closed.</p> |                |             |               |
| <b>Future actions</b>                                  | Whilst definitely not needed for the Invensys and SSL Pilot schemes, there will need to potentially be a review for a new supplier's Pilot Scheme proposals.                                                                                                                                                                                                                                                                                                                                                                                                     |                |             |               |

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|  | This is related to Future Derogation 6.11.2 because the current Pilot Scheme Suppliers might wish to revisit this particularly where data is being used. |
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#### 4.3.10 Circuits Drawn Out In Full (DER-81)

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |             |               |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|
| <b>Brief description of Current Practice/Process</b>   | All circuits drawn out in full with full nomenclature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |             |               |
| <b>Departures from Current Practice/Process</b>        | Use of configuration drawings which are akin to Typical Circuits as defined by RT/E/S/11701 Part M Clause 5.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |             |               |
| <b>Reason for wanting to challenge the standard</b>    | Reduced cost and standard architecture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |             |               |
| <b>Derogation identified to a particular Standard?</b> | <b>Standard Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Version</b> | <b>Date</b> | <b>Clause</b> |
|                                                        | NR/GN/SIG/11701                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3              | 06/12/2003  | Part M 5.5    |
| <b>Variation applied for</b>                           | Yes (Tracker 8751)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |             |               |
| <b>Type of Variation obtained</b>                      | Derogation (NC1) (no conditions on the certificate but the HAZID report details conditions)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |             |               |
| <b>Applicability</b>                                   | Modular Signalling Schemes (WRSL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |             |               |
| <b>Notes</b>                                           | <p>The current requirement is detailed within NR/L2/SIG/11201 Module A15 Issue 4 04/06/2011 Clause 5.5. The derogation granted is not reflected in the current standard and this has been pointed out to the Professional Head.</p> <p>This issue is related to 4.3.8 (Tracker 7801) as the configuration drawings are used to map LHSC/RHSC to the point lie the operator sees.</p> <p>The configuration drawing will not have object names put onto every sheet but will use the 1<sup>st</sup> configurable sheet to define the object number.</p> <p>Due to the relationship with 4.3.8 (Tracker 7801), the granting of this derogation was subject to a HAZID.</p> |                |             |               |
| <b>Future actions</b>                                  | <p>The HAZID report has conditions one of which is that, for point sheets, this will also map LHSNC and RHSNC to Normal or Reverse point lie (Conclusion 1 of the HAZID).</p> <p>The Standard Owner (Professional Head)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |             |               |