

INTEGRATION ENGINEERING SAFETY MANAGEMENT

Crossrail Process for Managing Interoperability Requirements

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Revision Changes:

Revision	Status / Description of Changes
2.0	2 yr. review. Change of title (removal of “TSI’s and Notified Technical Rules”) as this is designed to deal with interoperability in its’ widest sense. Acknowledgement of the TSI baseline, derogations and production of Local Rules applicable only to Crossrail. Acknowledgement of the Procedure “Adoption of New Technical Standards for Interoperability”
3.0	Update under CMS review in 2021.

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1 Purpose

Directive 2008/57/EC, Article 2 states:

“Interoperability means the ability of a rail system to allow the safe and uninterrupted movement of trains, which accomplish the required levels of performance for these lines. This ability depends on all the regulatory, technical and operational conditions which must be met in order to satisfy the essential requirements.”

The essential requirements are specified in a set of documents called Technical Specifications for Interoperability (TSIs). ‘Following the UK’s exit from the EU and the ending of the transition period on 31 December 2020, EU Technical Specifications for Interoperability (TSIs) have ceased to apply in the UK. The technical content of TSIs at the end of the transition period have been replicated as National Technical Specification Notices (NTSNs), which came into effect on 1 January 2021’. The purpose of this document is to define the process for identifying and managing the application of the Technical Specifications for Interoperability (TSIs) which are stated in the Crossrail Standards Baseline. The Standards Baseline can be accessed via the [Standards Page - Connect Online](#) or via the following link:

<https://transportforlondon.sharepoint.com/sites/CRLConnect/SitePages/Standards1.aspx>

This provides access to Crossrail Standards Baselines and many engineering standards.

2 Scope

The overall application of the Crossrail Standards Baseline, including Technical Specification for Interoperability (TSIs) is given in the Crossrail Standards Management Procedure [1] which should be read in parallel.

The scope of this document is limited to the identification and management of relevant TSIs, National and Local Rules for the central section of the Crossrail Project which is being brought into service under the Railway Interoperability Regulations (RIR) 2011, or subsequent revision to these Regulations, and where Crossrail Limited (CRL) is defined as the *Project Entity* under the Regulations.

It does not apply to the identification and management of TSIs and National Technical Rules (NTRs) for rolling stock where CRL is not the *Project Manager*. Nor does it apply to interfacing infrastructure which will be brought into service solely under the Railways and Other Guided Transport Systems (Safety) Regulations 2006, as amended.

This document does not apply to adjacent On Network Works, where Network Rail is the Project Entity, or works where London Underground is the Infrastructure Manager, who apply their own standards management processes. The 5 stations that are not under RIR (i.e. Bond Street, Tottenham Court Road, Farringdon, Liverpool Street and Whitechapel stations). For these stations, all of the station design on the platform side of the Platform Screen Doors shall be authorised under the ROGS Regulations and not the RIR.

3 Definitions

Definition	Description
ApBO	Approved Body (previously NoBO)
AsBO	Assessment Body
BS	British Standards
CRL	Crossrail Limited
(CRL) Local Rule	A technical Rule of a strictly local nature which has been developed in response to a derogation granted from a relevant TSI under Article 9. Such Rules are mentioned in the Register of Infrastructure (RINF) referred to in Article 35 and also reflected in the Asset Information Management System (AIMS) for Crossrail.
DeBo	Designated Body
DfT	Department for Transport
EN	Euro Norm
IC	Interoperability Constituent. This means any elementary component, group of components, subassembly or complete assembly of equipment incorporated or intended to be incorporated into a subsystem, upon which the interoperability of the rail system depends directly or indirectly. The concept of a 'constituent' covers both tangible objects and intangible objects such as software.
ITAP	Interim Technical Assurance Panel
LU	London Underground
NNTR	"Notified National Technical Rule" means a standard, technical specification or technical rule in use in the United Kingdom which has been notified to the Commission pursuant to article 16(3) of the High-Speed Directive or article 16(3) of the Conventional Directive.
NR	National Rule (as defined in RIR 2011). Note this encompasses both Technical and Safety Rules.
NTR	National Technical Rule
NoBo	Notified Body
NRIL	Network Rail Infrastructure Limited
PM	Project Manager (as defined in RIR 2011) – previously Contracting Entity under RIR 2006
RGS	Railway Group Standards
RINF	Register of Infrastructure
RIR	Railway Interoperability Regulations (implementing Interoperability Directive (2008/57/EC))
ROGS	Railways and Other Guided Transport Systems (Safety) Regulations
RSSB	Railway Safety and Standards Board
TSI(s)	Technical Specification(s) for Interoperability

4 Background

The Crossrail Project has prepared a procedure [1] for managing the standards baseline throughout the various stages of Project delivery. Departmental and functional responsibilities are defined in the procedure. The CRL Chief Engineer has overall responsibility for assuring compliance with the Railway (Interoperability) Regulations (RIR), which includes the assessment and identifies the need to apply for any derogations where compliance with the supporting Technical Specifications for Interoperability (TSIs)¹ and National Rules cannot be achieved. According to RIR, ‘interoperability’ means the ability of the rail system to allow the safe and uninterrupted movement of trains which accomplish the required levels of performance for those lines. The risk assessment of any alternative arrangements in case of non-compliances is discharged via the application of the CRL System Safety Plan [2] and subsequent Addendums.

Crossrail Limited is the Project Entity (PE) as defined by the RIR. The Project Entity is responsible for specifying the applicable TSIs and National Rules; and arranging the necessary conformity assessment by an Accredited body.

The following diagram (Figure 1) details the relationship between TSIs, National Rules and the overall Crossrail Standards Baseline.

The hierarchy is as follows:

Technical Standards for Interoperability (TSIs) (Covers Defined Essential Requirements – may have “open points”)

National Rules (NRs) covering UK National Cases as listed in the TSIs or Open Points at a national level.

Derogations may be granted by the Competent Authority against specific aspects of TSI’s or the complete scope of a TSI. Where derogations are granted, CRL Local Rules will be published instead.

Any dispensations from National Rules if agreed by DfT, are incorporated into the Register of Infrastructure (RINF) for Crossrail.

¹ Post Brexit, National Technical Specification Notices are published which replace TSIs.

Authorisation under Interoperability

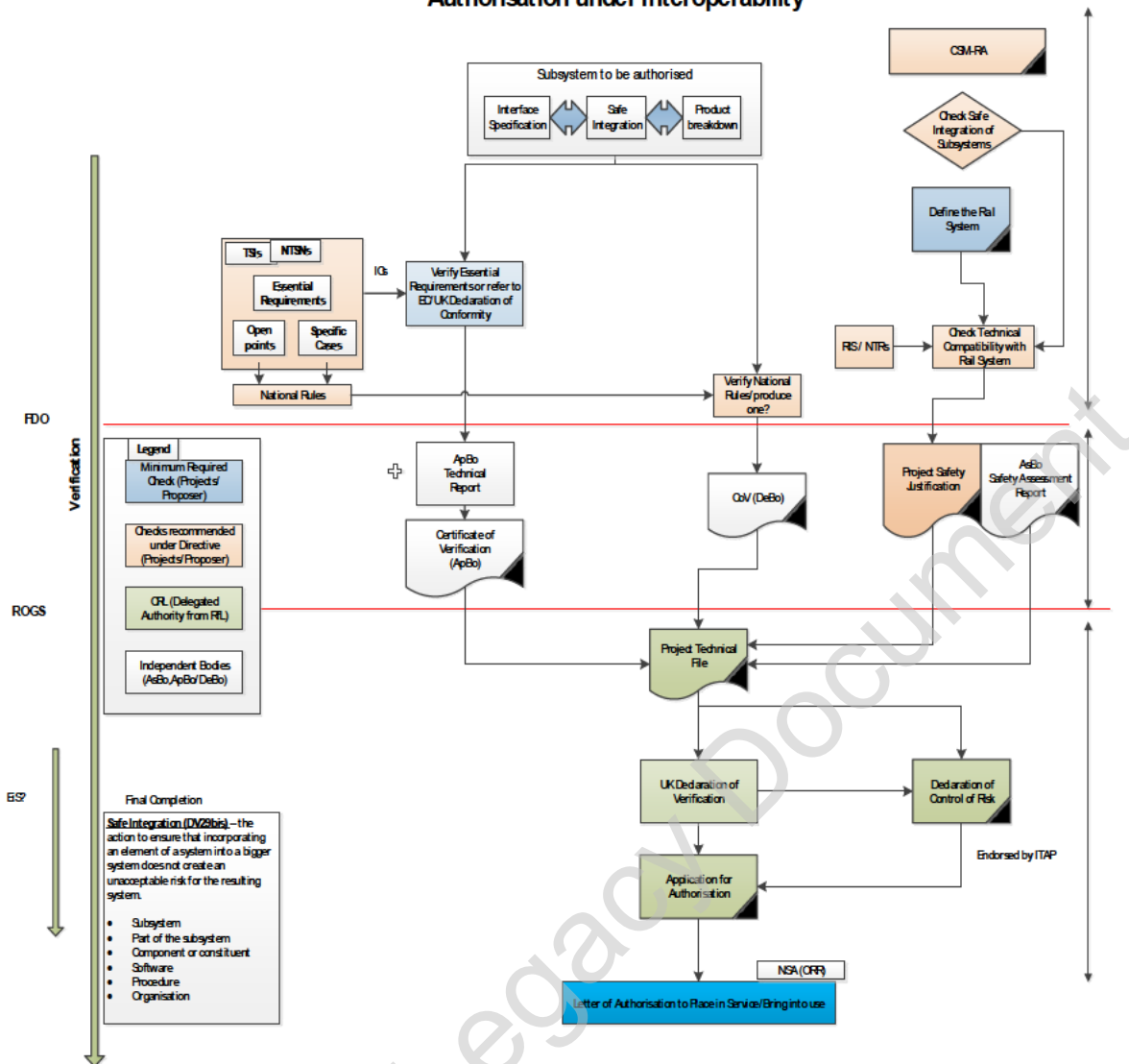


Figure 1: Interoperability process for achieving Authorisation

As highlighted in green in the diagram above, under RIR, CRL will produce project technical files for the nine stations and the main subsystems for obtaining interoperability authorisation. The technical file identifies the relevant rules and standards for CRL project and explains CRL arrangements for demonstrating conformity with them and having these verified by an independent approved body (for TSI /NTSN requirements) or designated body (for UK-specific requirements). ORR will ultimately check that CRL has carried out this process correctly and issue letters of authorisation to place into service based on the technical files submitted by CRL.

The project technical file is put together by the project entity (i.e. CRL) and it is based on the evidence and conclusions provided by the ApBo and AsBo technical files together with the technical characteristics of the subsystem for authorisation.

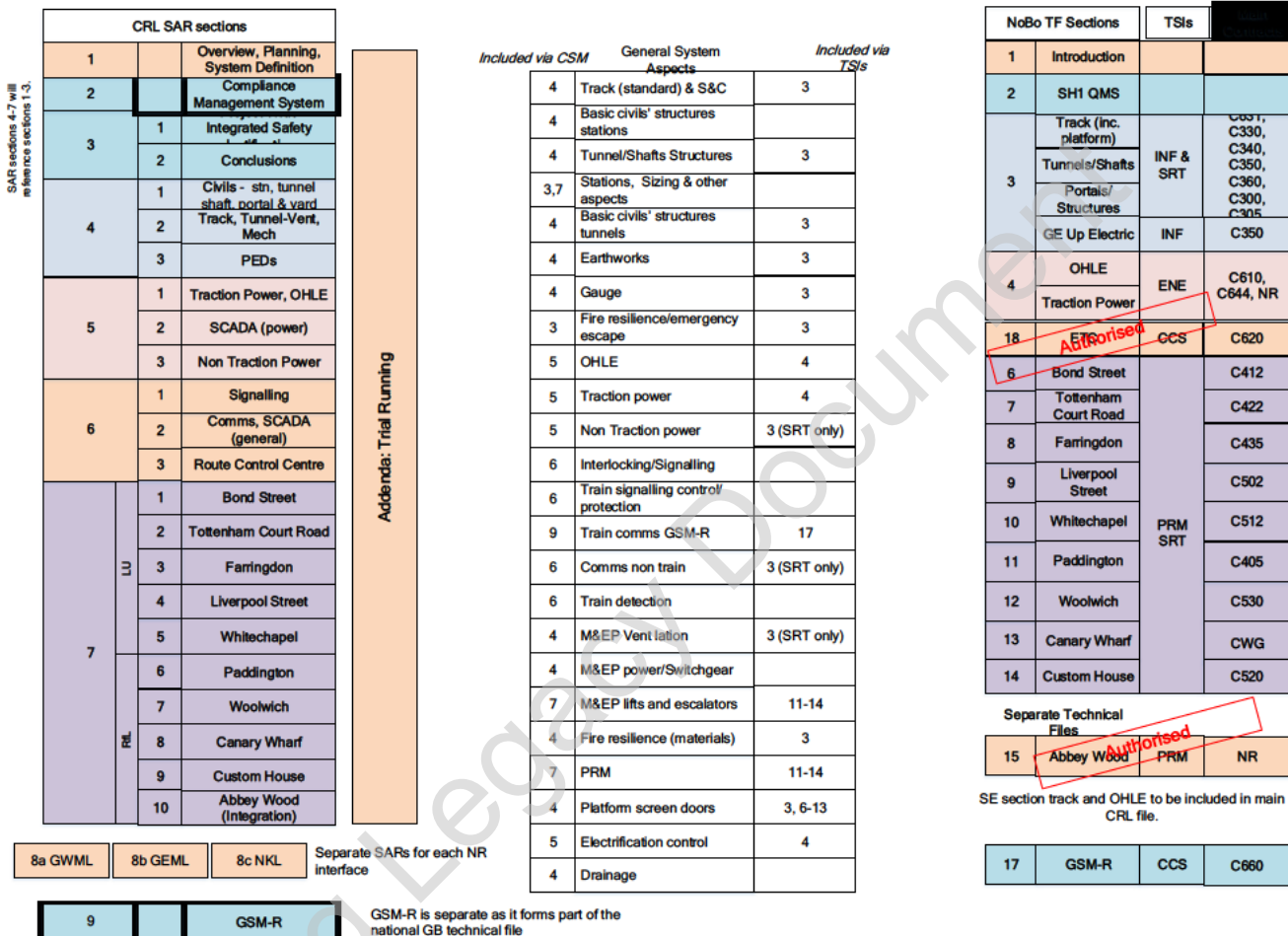
The UK declaration of verification is the document that confirms the project entity declaration that everything listed in the assessment file is correct. This is signed by the Chief Engineer as the System Design Authority under delegated responsibility from RfLI.

For any outstanding issue that needs to be reported, it is automatically fed in the declaration of control of risk and endorsed by the Interim Technical Assurance Panel (ITAP). Following the endorsement of the declaration of control of risk, the application for authorisation is made to ORR on behalf of the Chief Engineer.

ORR usually responds within 4 weeks with a letter of authorisation to place in service. However, if there are any questions or the technical file is incomplete this process can take much longer.

The Interoperability Manager is responsible for coordinating the process and managing the inputs and responses to ORR.

The following tables provide the agreed individual technical files required for authorisation of CRL central operation section. This has been agreed as part of the project authorisation strategy which was initially submitted to RAB(C) and an update subsequently submitted to RFLI Interim Acceptance Panel (ITAP).



Note: Please note the South East (SE) section technical file has been absorbed in part 3 of the infrastructure and safety railway tunnel technical file.

Figure 2 Structure of Crossrail's Technical File

Once Authorisation is granted, the corresponding Technical Files are transferred to the permanent owner of the subsystem RFLI, who are the Infrastructure Manager for the Crossrail Central Operating Section (CCOS).

Change Configuration processes apply in accordance with Crossrail Configuration Management Plan Post ROGS for Trial Running Document Number: CRL1-XRL-Z3-STP-CR001-50006.

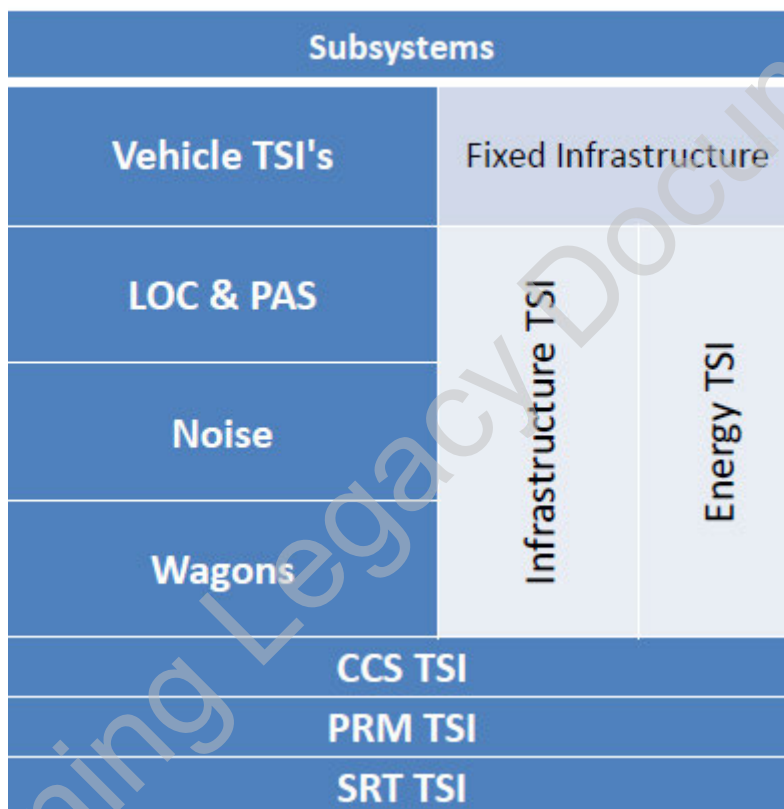
5 Technical Specifications for Interoperability (TSIs) – NTSNs

The Interoperability Directive (2008/57/EC) sets out a number of essential requirements to be achieved for interoperability, which includes safety, reliability and availability, health, environmental protection and technical compatibility along with others specific to certain sub-systems. The Directive also requires the production of mandatory Technical Specifications for Interoperability (TSIs) which define the technical standards required to satisfy those essential requirements.

The current Technical Specifications for Interoperability and their coming into force dates are given on the RSSB website (copy and paste the text below into internet browser) or DfT website.

The following diagram illustrates how the TSI's fit together to cover the structure of railway systems:

TSI's structural subsystems



Note: In addition, the Operations (OPE) TSI covers all subsystems. There is no requirement for authorisation against the OPE TSI.

5.1 Application on Crossrail

An agreement was reached between CRL and the DfT in 2010 that the Central Section Works would fall within the scope of the Interoperability Directive 2008/57/EC (amended) of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community (RIR).

Consequently, CRL will be seeking an authorisation to place into service for the relevant subsystems, based upon the following TSIs:

INFRASTRUCTURE TSI (INF) COMMISSION REGULATION (EU) No 1299/2014 (in force 01/01/15)

ENERGY TSI (ENE) COMMISSION REGULATION (EU) No 1301/2014 (in force 01/01/15)

PERSONS WITH REDUCED MOBILITY TSI (PRM) COMMISSION REGULATION (EU) No 1300/2014 (in force 01/01/15)

SAFETY IN RAILWAY TUNNELS TSI (SRT) COMMISSION REGULATION (EU) No 1303/2014 (in force 01/01/15)

CONTROL COMMAND AND SIGNALLING TSI (CCS) amendment COMMISSION DECISION (EU) 2015/14 amending Decision 2012/88/EU (in force 01/07/15)

These TSIs are listed by the CRL Standards Manager in the Crossrail Standards Baseline (refer to section 1.0 for link).

Crossrail is defined as a project at an advanced stage of development as per definition (t) of Article 2 of 2008/57/EC Interoperability Directive and on the list submitted by UK to EC DG Move on 22 December 2015 in accordance with article 9 (3) of the Interoperability Directive 2008/57/EC.

Taking into account the advanced stage of the project, CRL's decision on adoption of the above TSIs was dependent on the retention of specific requirements from the previous versions of TSIs in preference to the adoption of the equivalent requirement in the new version, where:

- the requirement of the previous version of the TSI has already been fully implemented, or
- it has been identified that there would be unacceptable implications to cost and programme from back fitting the equivalent requirement of the new version of the TSI,

The proviso is that the above would not result in a technical non-compliance against the new TSI. Details of the clauses retained from previous versions can be found in the document "Project Authorisation Strategy CRL1-XRL-O8-STP-CR001-50137-v.1.0 [5]

5.2 Verification Process for Crossrail

Crossrail is the Project Entity for the Central Operating Section. Accordingly, CRL has engaged Ricardo Rail (previously Lloyds Register Rail (LRR)) to carry out the verification assessment procedure in accordance with regulation 17 of the Railway Interoperability Regulations 2011 (as amended) as follows:

- Verification Assessments for those Technical Specifications of Interoperability (TSIs) and Notified National Technical Rules (NNTRs) requirements where CRL and its contractors have indicated that the verification evidence is currently available.
- The verification assessment primarily consists of review of evidence for each applicable sub-system clause, closure of any queries with designers and issue of verification reports.
- Undertaking audit and review activities of the CRL QMS system working closely with CRL's own audit activity.
- Intermediate Statements of Verification (ISVs) will be issued in accordance with document X2228-LLO-O-QTQ-CR001-50012 revision 2 and when all required evidence is verified as meeting requirements.

If required, the ApBO will assess the conformity or suitability for use of an Interoperability Constituent (IC) subject to the procedures indicated in the applicable TSI.

6 Departures from Standards (Derogations and Dispensations)

The process for managing departures from standards (concessions) on Crossrail [4] does not apply to Derogations and Dispensations against TSIs (NTSNs) / NTRs for which the provisions of Article 9 of EU Directive 2008/57/EC and Regulation 46 of the RIR apply. The CRL Technical Assurance Lead is responsible for the management of concessions. The Interoperability Manager is responsible for managing any exemptions from NTSNs.

7 Reference Documents

Ref:	Document Title	Document Number:
1.	Standards Management Procedure	CRL1-XRL-O6-GPD-CR001-50001
2.	Engineering Safety Management System SafetyPlan	CRL1-XRL-O7-GST-CR001-00001
3.	Crossrail Configuration Management Plan Post ROGS for Trial Running	CRL1-XRL-Z3-STP-CR001-50006
4.	Process for Managing Concessions toStandards	CRL1-XRL-O6-GPS-CR001-50001
5.	Adoption of New Technical Specifications forInteroperability	CRL1-XRL-O8-RGN-CR001-50031
6.	Asset Register	TBC
7.	Crossrail Standards Page	http://connect.crossrail.co.uk/sites/CrossrailConnect/Programme/Pages/Standards.aspx

8 Standard Forms / Templates

Ref:	Document Title	Document Number:
A.	None	