

ATOC

Association of Train Operating Companies

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2010

Approved Code of Practice – Approvals process for GSM-R Cab Mobile Fitment

Synopsis

To facilitate the approvals process for first of class and fleet fitment of GSM-R cab mobile radios by Train Operating Companies.

Submitted by:

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On behalf of ATOC Engineering Council

Contents

Section	Description	Page
Part A		
	Issue Record	3
	Responsibilities	3
	Explanatory Note	3
	Code of Practice Status	4
	Supply	4
Part B		
	1 Purpose	4
	2 Scope	4
	3 Definitions	4
	4 Introduction	6
	5 Approval Regime	6
	5.1 Verification Requirements	7
	5.2 GSM-R Approvals	7
	5.3 Railway Group Standard compliance	8
	5.4 Compatibility Assessment - GE/RT8270	8
	6 First of Class Approvals Process	9
	7 Fleet Fitment Approvals Process	11
	7.1 Project Start Up	11
	7.2 Design	16
	7.3 Installation	18
	8 Seeking authorisation and Technical File Management	20
	9 Associated Templates	21
	9.1 List of Templates and supporting documents	21
	10 Links	21

Appendices

- A Content of the technical file
- B Relationship between the Network Rail First of Class process and the Approvals process
- C Mandatory specifications and notified national technical rules
- D Notified Body Verification Modules
- E ISV for Generic Cab Mobile Installation Design
- F Generic Templates

Part A

Issue Record

This Approved Code of Practice will be updated when necessary by distribution of a complete replacement.

Amended or additional parts of revised pages will be marked by a vertical black line in the adjacent margin.

Issue	Date	Comments
2	November 2010	Updated in light of First of Class experience and preparation for Fleet Fitment

Responsibilities

Explanatory Note

This technical publication has been produced in consultation with rail professionals, and is to be disseminated within the railway industry.

However, ATOC is not a regulatory body and this publication is not a mandatory standard. This publication is advisory only and must be evaluated and implemented as appropriate at the sole discretion and responsibility of the user.

Every user is responsible for its own operation and carries full responsibility of ensuring safety of its own systems of work and inspection.

Whilst ATOC Approved Codes of Practice are intended to disseminate best practice, users must evaluate this technical publication against their own requirements in a structured and systematic way. Some parts of it may be decided not to be appropriate at the user's discretion.

Code of Practice Status

This document is not intended to create legally binding obligations between train operating companies and that it shall be binding in honour only.

Supply

Controlled and uncontrolled copies of this Approved Code of Practice may be obtained from the Head of Engineering ATOC.

Part B

1. Purpose

This Code of Practice is designed to provide a generic approach for the fitment of GSM-R Cab Mobiles under both the first of class programme and for fleet fitment.

First of class fitment of GSM-R is part of the National GSM-R implementation project. This will result in a series of approvals to demonstrate that the fitted radio installation meets all national, interoperability and stakeholder requirements.

The purpose of this document is to propose a common framework which:

- takes account of the approvals requirements
- presents a process which is as simple as possible, yet retains flexibility
- maximises reuse of 'common' evidence to prevent avoidable rework between fleets

This framework is based in part upon the experience gained to date with the first of class fitment of Class 320 and 156 vehicles. The principal potential advantages to operators in adopting this process are:

- derisking the approvals process, and
- reduced cost through adoption of common templates and compliance evidence.

It is a development of the guidance presented in the previous version of this guide. This guidance has been amended to:

- include changes in requirements as per RSSB Technical Notes TN-40 and TN-41
- to reflect the experience gained from the First of Class programme managed by Network Rail, and
- Include changes required in accordance with recent Commission Regulation on the adoption of a common safety method on risk evaluation and assessment, which enters into force on 19th July 2010.

2. Scope

This ACOP applies to the approvals associated with the First of Class cab mobile fitment programme and the subsequent fleet fitment process.

This document reflects only those aspects of the process, which are generic; it does not attempt to provide detailed guidance on aspects of the operator's safety management system and other verification activities.

It does not provide information regarding the co-ordination of the work between the train operators nor the management and sharing of technical files.

It assumes that the reader has a basic understanding of the approvals framework and of the EC Rail Directives.

3. Definitions

The Duty Holder	The professional Head of Engineering of a Train Operating Company or his/her representative.
Global System for Mobile Communications – Railways (GSM-R)	A digital radio system based on the GSM mobile communication standard adapted for use on European railways. The GSM-R system is defined by the Control Command and Signalling TSI.
Technical Specification for Interoperability (TSI)	The specifications by which each subsystem or part subsystem is covered in order to meet the essential requirements and ensure the interoperability of the trans-European rail system.
Notified National Technical Rule (NNTR)	National rules adopted by a member state and notified to the EU to address open points in the TSIs or where the TSI is silent.
Railway Group Standards (RGS)	A document produced pursuant to the Railway Group Standards Code (the Code) (or equivalent predecessor documents, including previous versions of the Code) defining mandatory requirements in respect of the mainline railway.
Engineering Change	A proposed alteration to existing train or component designs, maintenance or manufacturing processes or procedures, suppliers or supply arrangements, which has the potential to impact on the safe operation or asset life of T&RS. ATOC ACOP/EC/1006 Issue 2 provides general guidance, but this guide assumes that Vehicle Owners' own Engineering Change processes take precedence where imposed..
Notified Body (NoBo)	A body appointed by a European Member State (the DfT in the UK) and notified to the European Commission. They are recognised as approved throughout the EU to carry out assessment against the requirements of the Technical Specifications for Interoperability and to issue EC certification.
UK Designated Body (DeBo)	A body authorised by the DfT, as the competent authority for the UK, to carry out verification against Notified National Technical Rules and UK Specific Cases associated with the TSIs. UK Notified Bodies have been authorised to carry out this work by DfT.
Competent Person	An organisation or individual adjudged by the TOC to be competent to carry out assessment as described under Railways and other Guided Transport (Safety) Regulations 2006 (ROGS). Dependent upon the train operator and the significance of the safety risk, this can be an independent body or TOC staff. Typical independent bodies include Vehicle Acceptance Bodies, Notified Bodies and Independent Safety Assessors.
Voluntary Independent Verification Body (VIV)	This is an organisation appointed by the TOC to provide specific verification tasks, where there is no external requirement for independent verification.
First of Class (FoC)	The project for design and trial fitment of the cab mobile arrangements to each class of vehicle covered under Network Change Notice 3.
Intermediate Statement of Verification (ISV)	"ISV" means an intermediate statement of verification issued by a notified body in relation to the design stage or the production stage of a subsystem in accordance with Part 2 of Schedule 9 of the Railways (Interoperability) Regulations.

**European Commission
Regulation on the adoption
of a common safety method
on risk evaluation and
assessment (352/2009)
(CSM Regulation)**

The CSM Regulation establishes a common safety method on risk evaluation and assessment. It comes into force from 19th July 2010, for significant technical changes to rolling stock and to significant technical changes to structural subsystems that require an authorisation under Interoperability. .

4. Introduction

The implementation of GSM-R on UK rolling stock occurs in three stages:

- 1 the proving of the equipment and systems via the Strathclyde Trial;
- 2 the development of class specific design solutions for cab mobile fitment via the first of class programme; and -
- 3 subsequent roll out to the National Fleet.

This document sets out in section 5, the background and recommended controls for the first of class fitment of GSM-R to all classes of vehicles covered by Network Change Notice 3 as part of the GSM-R project and the subsequent fleet fitment.

It presents a generic process framework for First of Class fitment, based on the verification activities from the Strathclyde trial. The document also contains a set of templates that are provided to allow basic information from the trial to be re-used for the notified body verification for other train fleets. (Section 9). Section 7 outlines the process for the subsequent Fleet Fitment.

5. Approval regime

There are three areas of approval required for placing vehicles fitted with GSM-R cab mobiles into service:

- Statutory approval - under Railway Interoperability Regulations and ROGS, covering compliance with TSIs, NNTRs, RGS and compatibility issues
- ROSCO approval – in accordance with the ROSCO's own Engineering Change processes
- TOC approval –as defined in their own Safety Management System.

For further guidance on the requirements relating to Engineering Change, please see the industry Code of practice - ATOC/ACOP/EC/1006 issue 2.

5.1. Verification Requirements

The ATOC Guide to Vehicle Change presents the approvals regime in diagrammatic form. Figure 1 shows how the verification activities related to the GSM-R programme fit within this model.

NOTE: this model is based on the current UK regulations RIR 2006 and ROGS 2006 and will be subject to change when the new regulations are issued, which is expected to be in December 2010.

<i>Railway Interoperability Regulations</i> MAJOR CHANGE - GSM-R INSTALLATION VERIFIED AGAINST CCS TSI & NNTRS <i>CCS TSI - Conventional CCS TSI - High Speed NNTRS - GE/RT8080, GE/RT8015, GE/RT8082, GE/RT8270</i>	Significant Safety Risk N/A to GSMR project	Safety Management System OPERATIONS AND MAINTENANCE ARRANGEMENTS
Voluntary Independent Verification MODIFICATIONS TO THE TRAIN, NOT MAJOR AGAINST THE SCOPE OF THE ROLLING STOCK TSI THEREFORE COVERED BY TOC SMS For example, structural change (GM/RT2100), gauge (GM/ RT2149), fire risk (GM/RT2120, Requirements for Driving cabs (GM/RT2161), GSM-R Cab Mobile, Great Britain Open Interface Requirements (RIS-3082-CCS)		

Figure 1 Verification arrangements

Notified Body verification is carried out by the application of a series of verification modules, which are defined within each TSI. The Contracting Entity (the TOC in this case) determines which modules they wish the Notified Body to apply. These cover both the design and production phases of the project. Further guidance on the modules relevant to the Control-Command and Signalling TSI is given in Appendix D.

Although any Notified Body can verify compliance with the TSI, each Member State defines the arrangements for approving verifiers of their Notified National Technical Rules (NNTR). In the UK, NNTRs are generally Railway Group standards and DfT have authorised the UK appointed Notified Bodies to carry out this activity (referred to as UK Designated Bodies). Non-UK Notified Bodies are not necessarily authorised to carry out this verification.

Each TOC needs to determine the level of verification required to review the modifications to the trains, which are not covered under the Control Command and Signalling (CCS) TSI and NNTRs. The criteria for selecting the verifier is the responsibility of the TOC, as described in their Safety Management System (SMS). Further information is provided in section 5.3 below.

When placing a contract for verification activity, the TOC should therefore consider the following:

- Appointment of a Notified Body for verification against the TSI requirements
- Appointment of a Designated Body for verification of compliance with NNTRs
- If required by their SMS, appointment of an independent competent person to verify the compliance of the changes to the vehicles, not covered by the TSI.
- If required by their SMS, appointment of an independent competent person to assess the safety verification in accordance with the CSM regulation

Although not compulsory, it is possible to appoint a single body to undertake all of the verification roles, providing they have the necessary competence and authorisations for each.

Further guidance on the verification activities for this project and the interface with the technical file are provided in Appendix A.

5.2. GSM-R Approvals

In order for vehicles to operate the GSM-R radio, authorisation to place into service must be received from the ORR. This is not a requirement during the Strathclyde Trial whilst the vehicles are dual fitted and operating under trial conditions, as risks have been mitigated as the existing legacy radio can be used if there is a problem with the GSM-R system.

There are two stages to the approvals process for the roll-out from the Strathclyde trial for the on-board equipment:

- 1 The first of class process proves the design for each vehicle class covered by the Network Rail (NR) Network Change Notice 3. The design evidence will be used to prove that the design meets the requirements for the TSI and appropriate Railway Group Standards and the output will be an intermediate statement of verification (ISV) demonstrating the compliance of the design under module SB.
- 2 The certification of the on-board subsystem per class.

For example First of Class fitment for GSM-R voice involves three Notified Bodies per Class of Vehicle:

- 1 – Interoperability Constituent Certification of the cab mobile against the TSI requirements only - Siemens / Railcert
- 2 – Intermediate Statement of Verification for the generic aspects of the Cab Mobile Fitment and confirmation of the compliance of the Interoperability Constituent with the requirements of UK NNTRs – LR Rail
- 3 – Intermediate Statement of Verification for Cab Mobile fitment for each first of class (Notified Bodies to be appointed by each TOC.)

Once the design is proven, it can be rolled out for fleet fitment – this requires confirmation that the installation requirements ensure that the design proven in the FOC process are being consistently applied to the rest of the vehicles. Figure 2 shows this relationship.

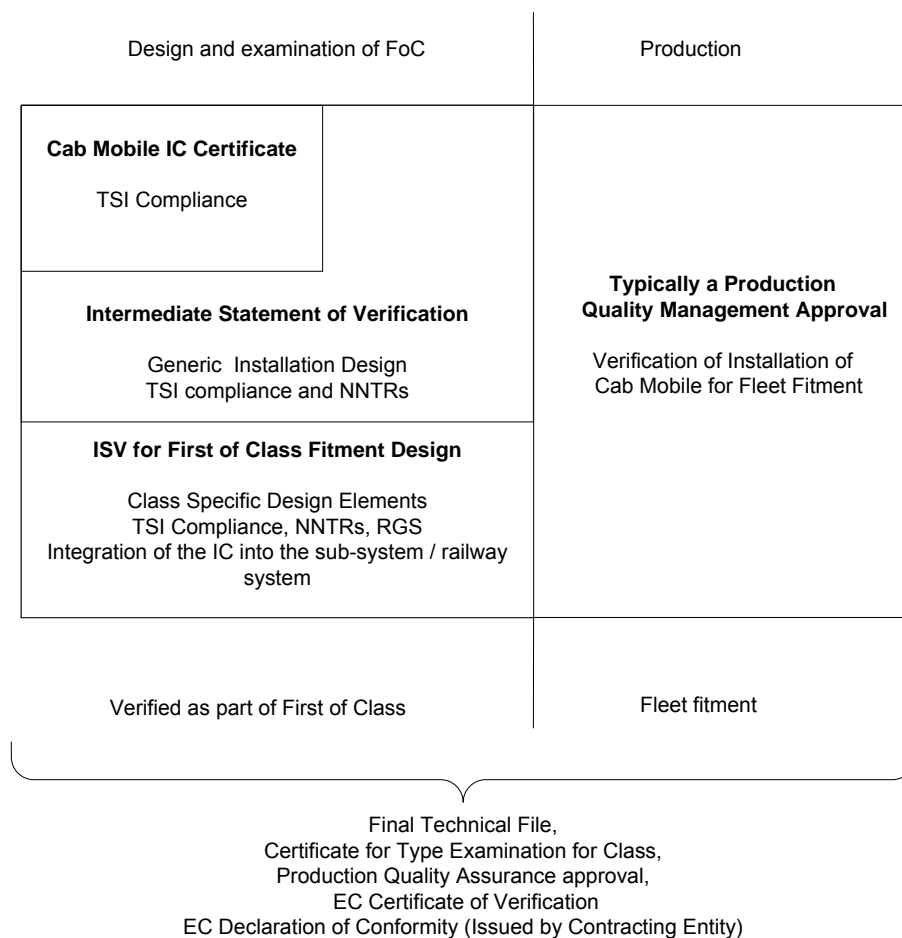


Figure 2

Relationship between certification

5.3. Railway Group Standard compliance

Not all changes to the vehicles are covered by the Control-Command and Signalling TSI and so the assessment of these additional changes fall under the operator's SMS and not the Notified Body approval. This is typically the compliance with Railway Group Standards such as GM/RT2100, GM/RT2149, GM/RT2130, GM/RT2161. The TOC Safety Management System will describe how these changes will be handled - is it a minor modification? Is independent certification required? Or will this verification be added to the Notified Body scope?

RSSB have amended [Technical Note – TN-040 Issue 3](#) in light of feedback from the industry.. This Technical Note clarifies the requirements for certification of the changes to the rolling stock sub-system, where the Train Operator has optionally chosen to employ a VAB for the assessment. The changes to the Rolling Stock sub-system can be considered a minor modification once the Control-Command and Signalling TSI requirements have been verified. This means that separate Engineering Acceptance certificates are not required for each installation.

The CCS TSI requires that changes to the vehicle are recorded in the National Vehicle Register. This function will be provided by the Rolling Stock Library. Fitment of GSM-R will be registered with the Rolling Stock Library in accordance with the new Technical Note – [TN-041 Issue 1](#). RSL data shall be updated when the GSM-R has been fitted and is in an operational state. NB - Partial fitment in preparation for operation, for example installation of cabling, brackets, aerial etc, where the vehicle returns to service without the GSM-R in an operational state does not need to be notified to RSL.

Registration of fitment of GSM-R to railway vehicles on the RSL should preferably be effected by the use of the RSLG4 form attached as Appendix A of the Technical Note – TN-041.

5.4. Safety verification

The CCS TSI requires that the notified body shall ensure the completeness of the safety approval process, including safety case. The requirements for safety verification are defined in the TOC's Safety Management System, however, from 19th July 2010; the CSM Regulation comes into force. This outlines a common safety method for risk evaluation and assessment, which needs to be addressed in the SMS.

If required by the SMS, safety verification in accordance with the CSM regulation should be carried out and included in the technical file.

Note: The Regulation does not apply to systems and changes, which, on the date of entry into force are projects at an advanced stage of development as per the Interoperability Directive (2008/57/EC) As most First of Class designs would be well advanced, it is unlikely that the CSM regulation would be applied but the decision, ultimately lies with the Train Operator as per their SMS.

5.5. Compatibility Assessment – GE/RT8270

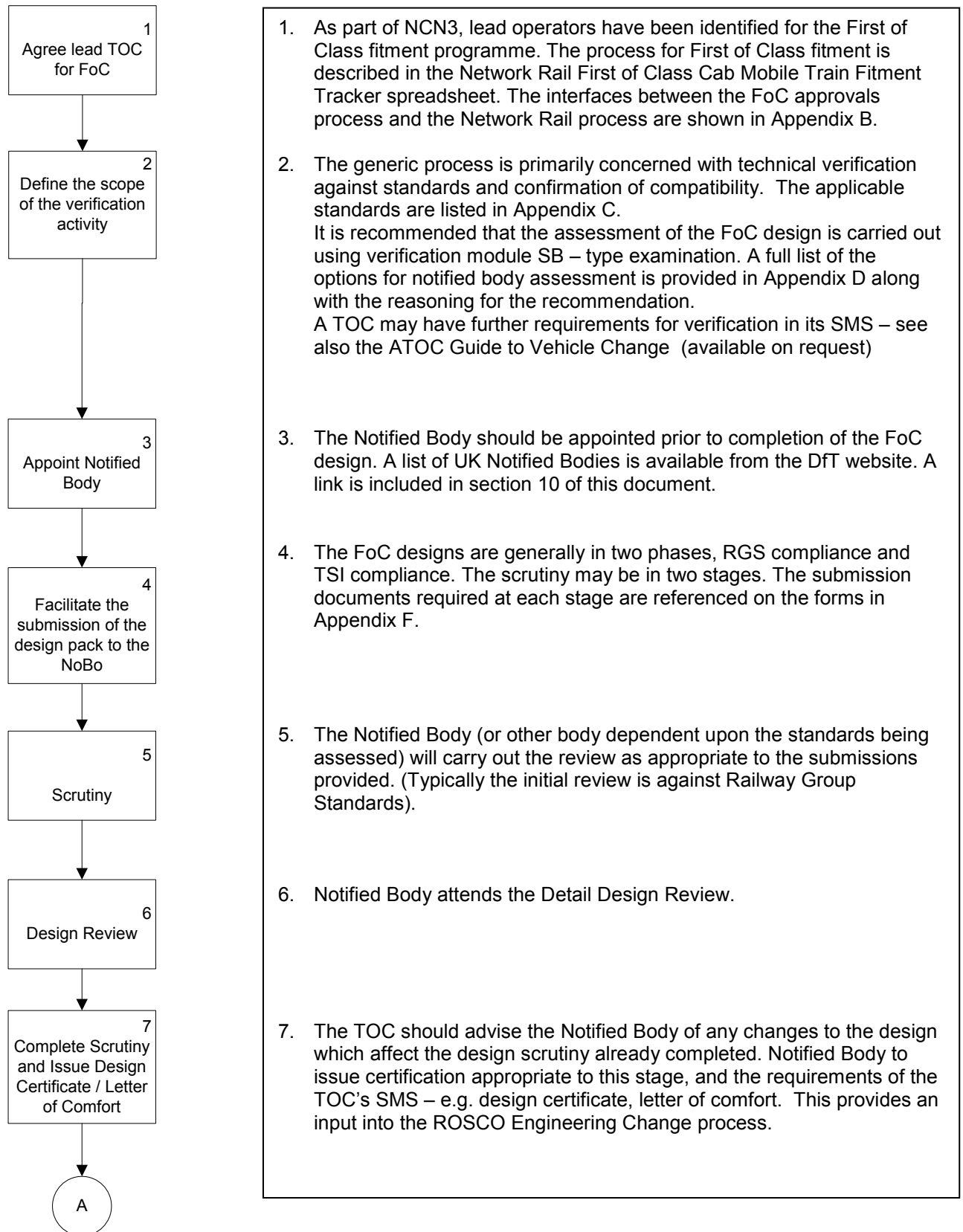
GE/RT8270 Issue 2 is an NNTR for the CCS TSI and requires assessment of compatibility of Rolling Stock and Infrastructure. These issues have been addressed generically, but there are some requirements with which the cab mobile installation must comply and therefore there will need to be a final statement of compatibility for each design to confirm that these have been met.

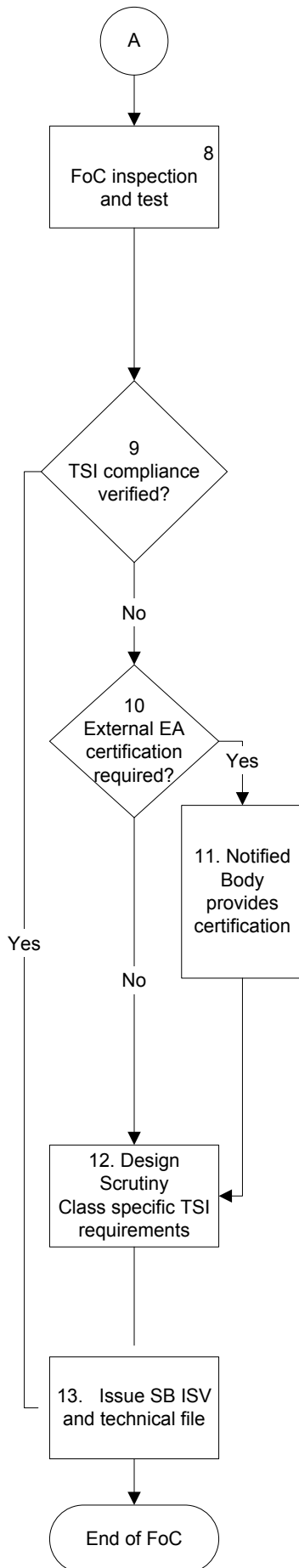
EMC compatibility has been demonstrated generically for all vehicle classes providing the following criteria are met by the installation design:

- The routing of cables is in accordance with the Siemens recommendations, as per the UK GSM-R Cab Radio Project EMC Management Strategy, 666/PZ/86039/000
- The GSM-R antenna location on the roof is an acceptable distance from any other antennas as defined in the UK GSM-R Cab Radio Project Interface Control Document – 666/UJ/86001/000 Appendix A - GSM-R ANTENNA INSTALLATION CONSTRAINTS

6. First of Class Approvals process

The proposed process is set out in this section, supported by the appendices. Users are reminded that they must still adhere to their own company processes for managing change and commercial issues. This process should be read in conjunction with ACOP/EC/01006 – Approved Code of Practice – Inter-Company Train Engineering Change Approval Process.





8. The notified body verifies production activity and type testing.

9. If the first of class fitment is completed before the issue of the TSI Compliance submission for the Class, then the vehicle may need to be certified in accordance with the TOC's SMS to allow it back into traffic, before the TSI compliance can be verified and the ISV issued.

10. If required by the TOC, the Notified Body may be asked to raise Engineering Acceptance certification for the release of the vehicles back into traffic.

11. If required by the TOC's SMS, the NoBo will raise and issue an Engineering Acceptance certificate/ Letter of Comfort.

Release of vehicles into service

The completion of the First of Class process will result in vehicles being released into traffic in a state where the GSM-R radio can not be operated – i.e. with the radio removed and the original legacy radio refitted, or on dual fitted vehicles, blanking plates fitted in the cab or the radio fitted but isolated.

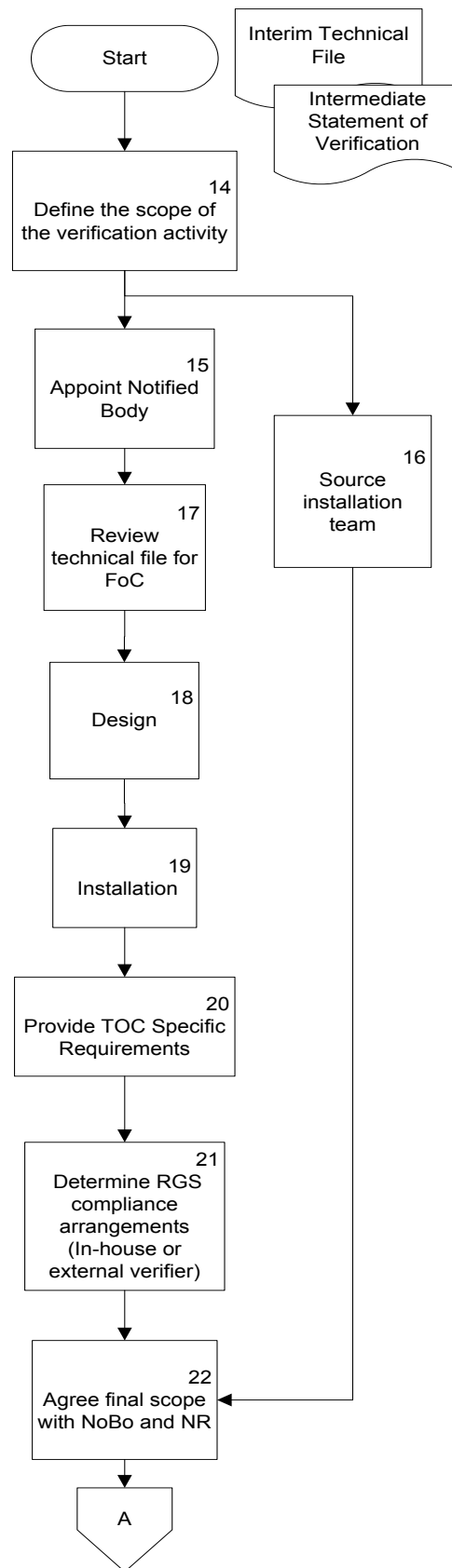
12. Once the TSI Compliance submissions are available, the Notified Body will complete the scrutiny and add their verification records with the technical file produced for the 'Generic Cab Mobile Installation Design', the IC Certification and the Interim Statement of Verification for the Generic Installation Design.

13. The Notified Body will prepare an intermediate statement of verification for the examination of the cab mobile installation for the Class of vehicle. This will be supported by a technical file addressing all the requirements as per Appendix A, as far as is practical given the limited completion of the project (i.e. cab mobile installation design only).

7. Fleet fitment Approvals process

7.1 Project Start Up

The following guidance is provided to help TOCs identify the best options for fitment to subsequent vehicles.



14/15. Fleet fitment will be based on the work carried out during First of Class fitment. The TOC should determine the scope of verification needed

The scope will need to be confirmed once the NoBo is appointed and any changes to the design have been scrutinised..

16. When deciding how to carry out the installation, the implications on verification costs should be considered. Guidance on the installation options is available in the document – Certification of Installation activity – Fleet Fitment of GSM-R Cab Mobile Radio Systems Ref: 108176 Issue 02. This document is available from the Network Rail GSM-R Project team via the GSM-R website.

17. In order to be able to use the First of Class technical file, there are a number of checks that need to be made to confirm that the equipment installed on the vehicles are covered by the First of Class technical file. For example:

- Is the version of the cab mobile to be fitted to the vehicle the same as that included in the technical file (typically 1E)?
- Are the components used on this installation the same as those included in the technical file?
- Are the certificates associated with this equipment current?
- Is the GSM-R Radio connected to the OTMR? (Generally First of Class vehicles did not have this interface connected)
- Are any Temporary Non-compliances applicable? Are these still relevant for the installation? Have they been replaced by derogations?

Where there are differences between the FoC technical file and your installation, these will need to be verified / addressed in the technical file.

18. See the flow chart in section 7.2 to determine the extent of design scrutiny required for the fleet fitment vehicles

19. See the flow charts in section 7.3 to determine the approach to the verification requirements for the installation. This should be used in conjunction with the Installation guide.

20. The First of Class technical file does not include any of the elements of TSI and NNTR compliance which are the responsibility of the operator under their SMS.

The following table identifies these requirements. NOTE: The requirements are taken from the Conventional Control-Command and Signalling (CCS) TSI, but can be read across to the High Speed CCS TSI.

Standard	Requirement	Typical Evidence
CCS TSI	4.2.1 Control-Command safety characteristics relevant to interoperability. This section makes reference to 'reserved standards' for reliability and availability requirements and safety requirements and requirements to safety analysis for interoperability.	Review as part of the TOC Safety Management System.
	4.3.1.1 and 4.4 – Operating Rules	The TOC will need to ensure that they have addressed the issue of Operating Rules within their arrangements for operation, under their SMS and in accordance with the Traffic Management and Operations TSI. The NoBo does not verify any of this data, but will include a reference from the output of the safety verification / SMS assessment in the technical file.
	Table 6.1 – Verification requirements for On-board control-command assembly – “The notified body shall ensure the completeness of the safety approval process, including safety case”.	Output of the safety verification process as defined in the TOC SMS, and taking into account the CSM Regulation for new projects.

	6.2.2.3 – On-board Assembly validation – Compatibility with rolling stock equipment and environment (e.g. EMC) and with the Track-Side Assembly	It is expected that the testing from the Strathclyde Trial is applicable as evidence of Operational Testing, however, if the test results can not be used to support this, additional testing may be required.
GE/RT8080 GE/RT8081	There are a number of requirements relating to the Train Operator see table below.	Clause by clause response from the Operator.
GE/RT8270	Evidence of compatibility assessment	Much of the supporting evidence will have been proven during the First of Class process, but the completion of the GE/RT8270 is a train operator requirement. A statement of compatibility will be included in the Technical File.
GE/RT8082	Compliance relates to the Cab Mobile – however, there are a number of Temporary Non-compliances, which need to be considered by the operator.	Confirmation of the validity of any TNC.

NNTR	Clause	Requirement
GERT8080	3.1.1	Train operators shall ensure that a train radio can be operated from each cab that is required to be used as a driving cab of a train in service- The installation can either be permanent or utilise transportable or portable equipment, provided that the train radio is compliant with all applicable requirements in this document.
GERT8080	3.1.2	The train operator shall ensure that:
GERT8080	3.1.2.a	a) the driver always has access to a train radio that is compatible with the train radio fixed infrastructure on each of the routes travelled by the train when in service.
GERT8080	3.1.2.b	b) train radios have sufficient power supply for the duration of the journey, with an appropriate contingency allowance.
GERT8080	3.3.1.e	e) the identification of locations and scenarios where only intrinsically safe equipment can be used because of a risk of explosion.
GERT8080	3.3.2	Train operators shall be responsible for;
GERT8080	3.3.2.a	a) the provision and maintenance of all train radio system equipment mounted on rail vehicles
GERT8080	3.3.2.b	b) the provision and maintenance of test facilities required to demonstrate that train radios are operational
GERT8080	3.3.2.c	c) where applicable, identifying locations and scenarios where Only intrinsically safe equipment can be used because of a risk of explosion.
GERT8080	5.2.9	Only one train radio shall be operational at any one time.
GERT8080	5.2.10	The train operator shall have documented procedures in place to cover multiple train radios in the same cab including:
GERT8080	5.2.10.a	a) a procedure to ensure that the correct train radio is in use at all times.
GERT8080	5.2.10.b	b) a procedure for using a single train radio user interface where such an interface is provided.
GERT8080	5.2.19	The driver shall continue to have access to the train radio system under train failure conditions, unless the train radio system suffers an internal failure that prevents communication.

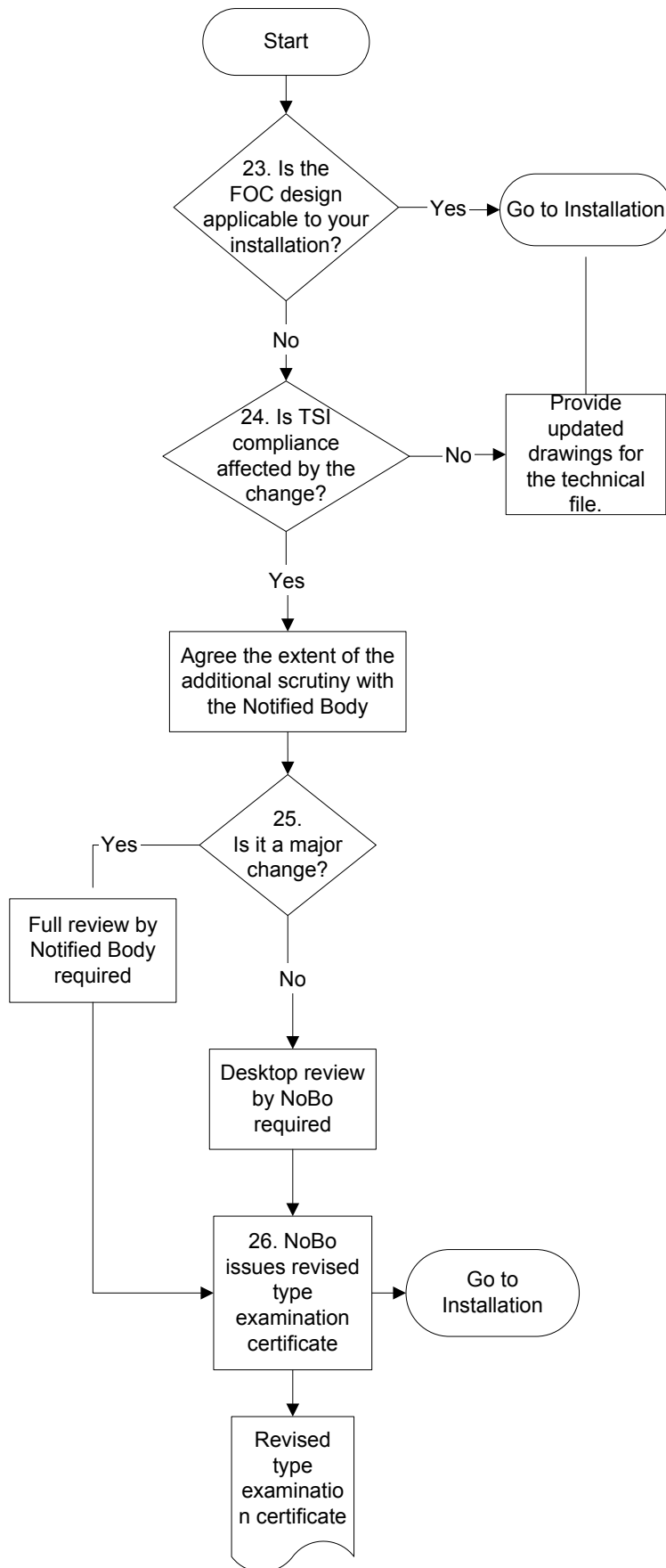
NNTR	Clause	Requirement
GERT8080	5.2.22	If press-to-talk (PTT) facilities are used during emergency calls, the PTT shall be tested and proven to be operational before entering in service. The PTT test shall not result in an emergency call being initiated.
GERT8081	3.1.3	Railway Group members in receipt of SIM cards from the infrastructure controller shall control their onward distribution. Railway Group members shall retain records of all authorised SIM usage, including details of contractors or other third parties who are users.
GERT8081	3.1.4	Railway Group members shall ensure that SIM cards no longer required are remotely disabled by the infrastructure controller and then returned, in a secure manner, to the infrastructure controller.
GERT8081	3.1.8	Railway Group members shall inform the infrastructure controller, upon detection, that a SIM card is being used for a purpose for which it was not intended, or has been lost, stolen or damaged. In these circumstances the infrastructure controller shall disable the SIM card from access to the network.
GERT8081	3.1.9	Train operators shall ensure that any GSM-R radio that is to be normally used as a cab radio is equipped with a SIM card configured as a "cab radio" and, as minimum, is able to: a) comply with the mandatory EIRENE FRS and SRS requirements relating to cab radios b) comply with the optional EIRENE FRS and SRS requirements listed in Appendix A which relate to cab radios.
GERT8081	3.1.10	The train operator shall permit access to the cab radio, for maintenance purposes only, to the authorised maintainer.
GERT8081	3.2.3	Train operators using this multi-connection functionality shall undertake a workload assessment of an on-train staff to ensure that all calls can be made without unduly distracting the driver,
GERT8081	3.3.1	Train operators, in consultation with the infrastructure controller, shall ensure that any issued GSM-R handportables, in addition to the train radio, are compatible with the implemented GSM-R fixed infrastructure.
GERT8081	3.3.2	Train operators, in consultation with the infrastructure controller, shall develop procedures to control the use of GSM-R handportables provided to drivers and traincrew. The procedures shall, as a minimum, cover the following factors:
GERT8081	3.3.2.a	a) scenarios when the GSM-R handportable is to be used, when it is not to be used and when it is to be switched off. In particular, limitations on the use of the GSM-R handportable when the driver has access to a working train radio
GERT8081	3.3.2.b	b) protocol for identifying calls to signallers and regional controller as being from the driver of a specific train
GERT8081	3.3.2.c	c) availability and use of railway emergency call functionality
GERT8081	3.3.2.d	d) avoiding driver confusion if both the GSM-R handportable and cab radio receive a GSM-R railway emergency call in the cab. This could be avoided if either the driver handportable is configured so that it cannot receive railway emergency calls, or the driver is instructed to switch off the GSM-R handportable while in the cab and the GSM-R cab radio is working
GERT8081	3.3.2.e	e) avoiding the initiation of unwanted (accidental or deliberate) railway emergency calls
GERT8081	3.3.2.f	f) ensuring that the GSM-R handportables battery life is maintained.
GERT8081	3.3.3	Train operators shall ensure that the drivers GSM-R handportable is suitable for the environment in which it is required to operate.

NNTR	Clause	Requirement
GERT8081	3.3.4	If the drivers GSM-R handportable is required to be available for use when in the cab, then the train operator shall provide a suitable housing for the radio within the cab.
GERT8081	3.3.5	If the driver is required to be able to use the GSM-R handportable to make and/or receive railway emergency calls, then the train operator shall ensure that the GSM-R handportable supports this functionality.
GERT8081	3.3.6	If a driver is required to forward point-to-point calls from the cab radio to the GSM-R handportable (for example, prior to leaving the cab), then the GSM service Call Forwarding on No Reply (CFNRy) shall be used for call forwarding. To support this mode of operation:
GERT8081	3.3.6.a	a) the train operator shall ensure that the cab radio supports the GSM service Call Forwarding on No Reply (CFNRy)
GERT8081	3.3.6.c	c) the train operator shall ensure that the cab radio human machine interface design takes cognisance of the need to set up and cancel call forwarding to handportables.
GERT8081	3.3.7	Train operators shall ensure that when using an operational radio instead of cab radio, then:
GERT8081	3.3.7.a	a) the full requirements of this standard shall apply
GERT8081	3.3.7.b	b) the operational radio, together with its associated equipment, satisfy the basic functionality and basic performance requirements for train radios, as set out in GE/RT8080
GERT8081	3.3.8	when a cab radio has failed, the requirements set out in GO/RT3437 apply.
GERT8081	3.4.10	Train operators shall ensure that any train that requires remote access is configured correctly to the infrastructure controllers network

21. Changes to the vehicles not covered by the Control-Command and Signalling TSI will require additional verification. The method for completing this verification is dependent upon the TOC's SMS, as outlined in section 5.3.

22. Agree the final scope

7.2 Design



23. The main decision is to identify whether the installation design that will be adopted on the fleet fitment vehicles is covered by the design described in the First of Class type certificate. (The Intermediate Statement of Verification in the FoC Technical File).

Most operators will have been involved in the design reviews for the First of Class process and so should already be aware if there are any novel features in their vehicles which mean that additional design activity needs to be completed before the installation can proceed. A First of Class design may include drawings showing several conformant arrangements e.g. different DCP positions, a range of antenna positions etc.

If the design is as per the approved First of Class drawings and instructions, the operator does not need to seek any additional design verification by their Notified Body, and can use the Intermediate Statement of Verification as evidence that the design meets the TSI requirements.

24. The Type Examination certificate issued as part of the First of Class process covers a vehicle type, not just a single design. As long as any changes to the design do not affect TSI / NNTR compliance, the type examination certificate can cover minor changes to the design, e.g. changes in cable runs, minor changes to brackets etc.

25. In some cases, the changes may impact on the validity of the compliance evidence from the First of Class assessment. For example, an operator may chose not to fit a UPS. In this case, compliance with GE/RT8080 and EIRENE requirements will require a different argument relating to operation when power is lost, from the one included in the FoC technical file. This would require the Notified Body to complete a desktop review of the new argument and to issue a new type examination certificate.

Another example where a desktop review would be required is where the antenna can not be fitted as per the drawing. As long as the antenna is repositioned within the criteria identified in the Siemens Interface Control Document (ICD) – 666/UJ/86001/000, the NoBo scrutiny would be limited to a desktop review to confirm that the ICD parameters have been met. The Interface Document forms part of the generic technical file and is also available from the NR GSM-R Portal. (NOTE: the impact on vehicle gauge will also need to be checked, but this is part of the RGS compliance / compatibility assessment).

If the change is a major change, for example, an operator may want dual fitment, when the First of Class design was for replacement fitment, then the level of additional scrutiny by the Notified Body would be greater, including verification of the installation and testing.

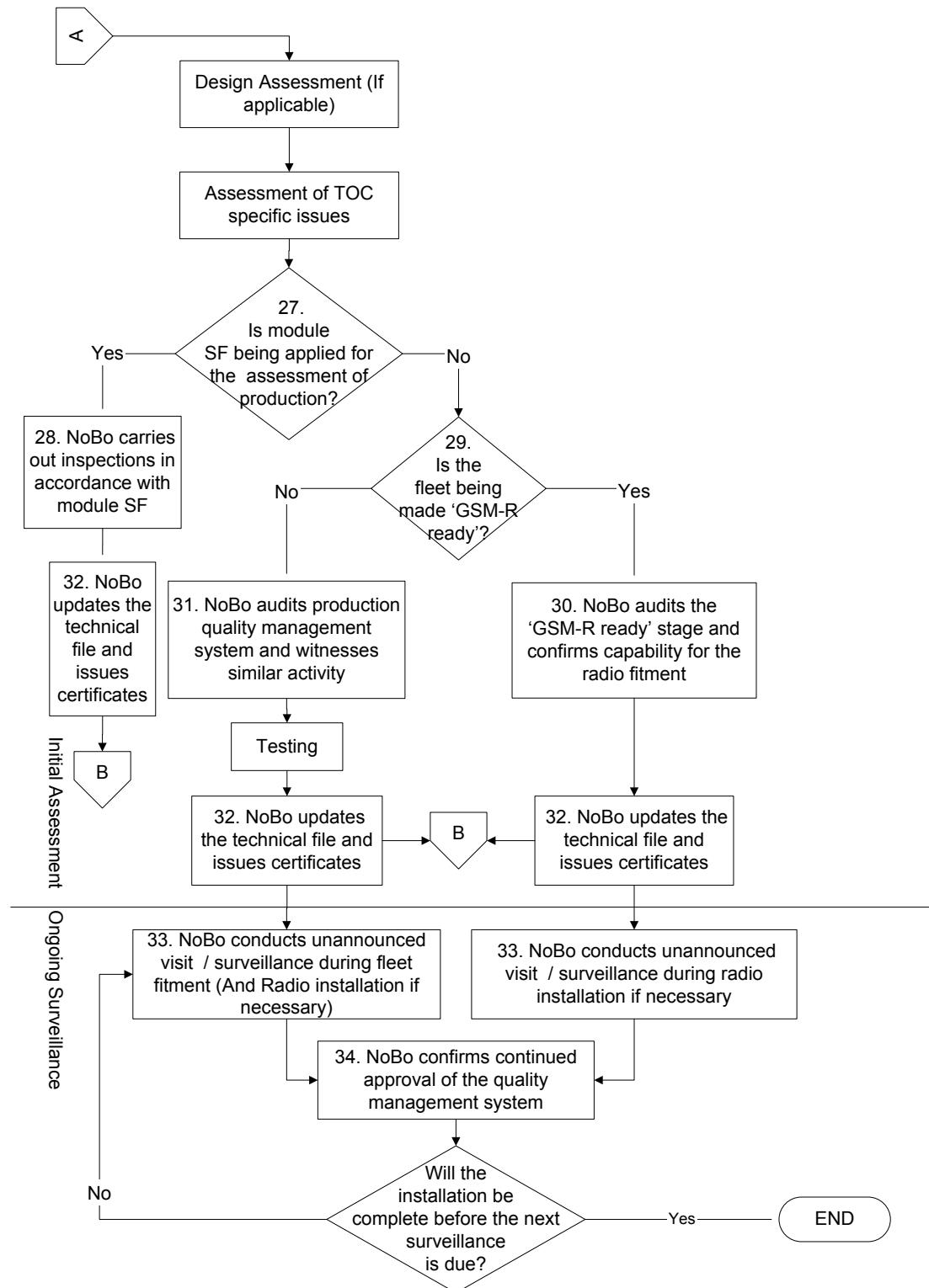
The significance of any change between the First of Class design and the revised design needs to be agreed with the Notified Body – i.e. in determining whether the change is major or minor.

26. If TSI compliance is affected by the change in design, a new type examination certificate will be required, which describes the revised 'type' for the class. This will replace the Intermediate Statement of Verification issued as part of the First of Class process

The assessment of major design changes which will result in a revised Notified Body certificate would be carried out in accordance with the Module SB in the TSI – Type Examination. This involves:

- scrutiny of the changed design against the TSI requirements, and associated standards and notified national technical rules.
- Examination of the installation and testing of the revised design, (first installation)
- Re-issue of a type examination certificate for the revised design

7.3 Installation



27. The operator should confirm with the Notified Body, which module is to be applied.

28. For module SF, the Notified Body will inspect each installation.

29. GSM-R ready is an intermediate stage, where the mechanical and electrical installation is completed prior to radio fitment. No TSI verification is required to put the train into service post GSM-R Ready, but the TOC SMS Verification of safety and RGS compliance will be necessary.

30. Where GSM-R ready installation is carried out in advance of the first vehicle having an operational radio, the initial SD assessment can be carried out during the GSM-R ready installation

and include the witnessing of the implementation of the quality management system. The Notified Body will also review the arrangements in place for the subsequent installation of the radio and associated testing; confirm competence of the personnel involved and the capability of the installer to complete this activity. This allows a certificate of production quality management assessment to be issued prior to radio fitment and will allow an early submission of the technical file for ORR scrutiny.

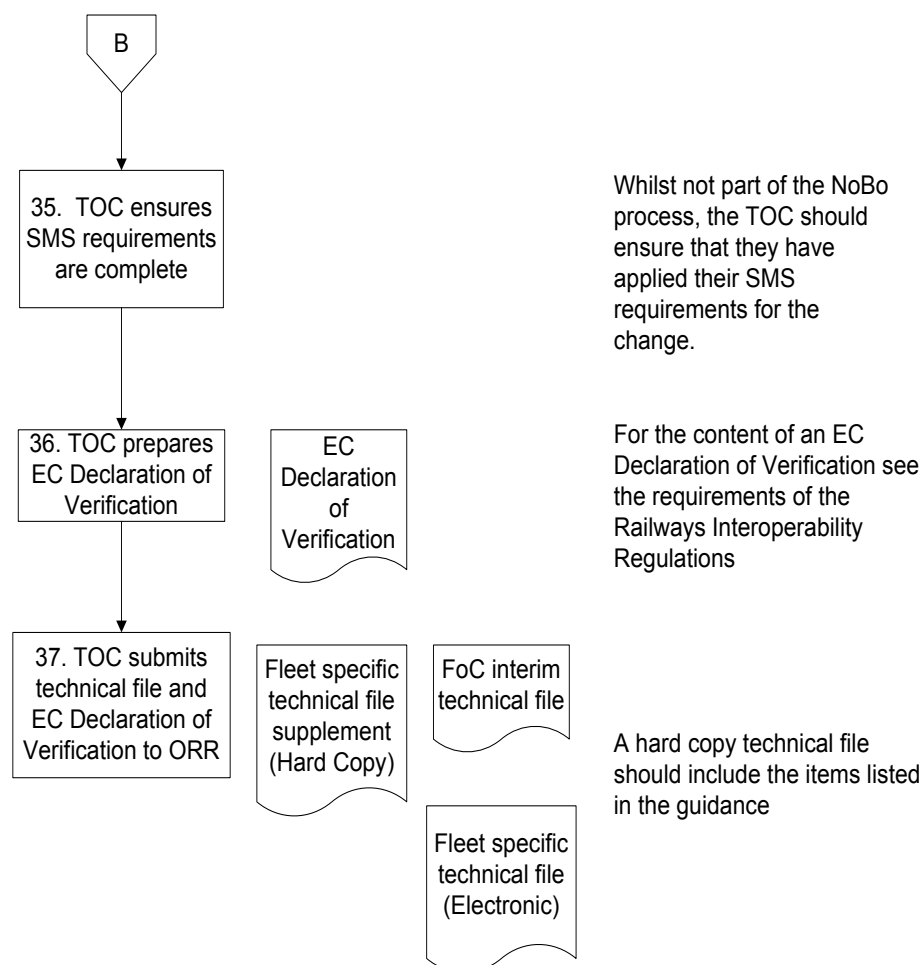
31. A production quality management system assessment verifies that the organisation has the processes and procedures, capability and competence to deliver the design as approved during the type examination on a routine and consistent basis. It is therefore possible to assess a large proportion of the management system based on an organisation's ability to deliver similar work, and demonstration that the SB requirements have been translated into production quality plans / installation instructions.

32. Once all the verification activities have been completed, the NoBo will update the Technical File, including any operator specific references to maintenance, safety verification and operations and the statement of compatibility / compatibility file. An EC certificate of conformity will be raised (this will have a limited scope, as the GSM-R voice is only a part of the CCS on-board subsystem and therefore full compliance with the rest of the CCS TSI (the non-GSM-R Voice parts) has not been demonstrated) This will be supported by the SB Type Examination Certificate and the Certification for the Installation activity (SD or SF) Appendix D provides additional information regarding the modules.

33. The operator provides a programme for the fleet fitment / radio installation and the NoBo conducts a surveillance visit (at a maximum of 12 monthly intervals) to verify that the approved production quality management system is being applied. The TSI allows the Notified Body to conduct unannounced visits in addition to routine surveillance. (Note: It may not be necessary to witness the radio installation; this should be agreed with the NoBo.)

34. The NoBo issues a report confirming that the quality approval is still valid. The Operator should include this in the technical file.

8. Seeking Authorisation and Technical File Management



35. For clarification see point 20 in section 7.1.

36. Once the Notified Body has produced the technical file and EC Certificate of conformity, it is handed over to the operator (as the contracting entity) who is responsible for raising the EC Declaration of Verification. The requirements for an EC Declaration of Verification are defined in Schedule 8 of the Railways Interoperability Regulations.

37. ORR has requested that a hard copy technical file is provided as part of the submission for authorisation. However, this need not include all the supporting documents and the list below identifies the hard copy documents required for each section as per the NB-Rail guidance.

Section	Title	Description
1	Notified Body and Contracting Entity	Hard copy required
2	Notified Body Certificates	Hard copies required
3	Constraints on use including reservations recorded	Hard copy details of class specific constraints and any class specific TNCs / derogations
4	Project Scope and Definition	Hard copy scope document
5	General Project Documentation	Most of this is from the generic Technical File. However, if there are design changes incorporated in the design, updated document lists should be provided. Installation records, maintenance, operations and safety verification from the TOC SMS will be additional elements of the technical file not from the First of Class Interim File.
6	Conformity Process Information	The Fleet Fitment specific reports should be provided in hard copy. The First of Class verification will be a mix of generic and class specific.
NNTRS	Notified National Technical Rules	Details of the Train operator specific compliance should be referenced and evidence of scrutiny provided in hard copy.

Once the GSM-R system is placed into service and is operational, the maintenance of the technical file will be managed in accordance with the standard Engineering Change process and is the responsibility of the operator. This technical file includes references to the maintenance plan for on-going maintenance for the GSM-R on-board sub-system.

9. Associated Templates

Draft templates are included in Appendix F to assist in the preparation of the information for verification. Colour and style coding identifies whether the evidence is likely to be generic or unique to the class of vehicle under review, as follows:

- **Items that will apply across the various vehicle types and will require no updating**
- *Items that are class specific and unique to that vehicle type*
- *Items which are class specific, but are variations on previous design arguments and a review of the differences is required, not a complete review. This section also includes documents that are only subject to minor changes to reflect new class description. (i.e. not a material difference)*

9.1. List of templates and supporting documents

- Typical design submission pack – F1
- Checklist for SB submissions – F2

NOTE: these are initial drafts issued to operators for discussion and trial and may be refined because of practical experience.

- Interoperability Constituent Certificate – Siemens Declaration of Conformity – 09/003.

- Interim Statement of Verification – Generic Cab Mobile Design - 0038/0/SB/2009/CCS/ENEN/20090002A (Appendix E)

10. Links

The latest published standards and requirements are available at the following links:

1. Conventional Control Command and Signalling TSI / High Speed Control Command and Signalling TSI

See the DfT catalogue of TSIs

<http://www.dft.gov.uk/pgr/rail/interoperabilityandstandards/interoperabilitystandards/cataloguetsis/>

2. Notified National Technical Rules

<http://www.dft.gov.uk/pgr/rail/interoperabilityandstandards/interoperabilitystandards/nntsr/>

3. ROGS – Railways and other Guided Transport Systems (Safety) Regulations

<http://www.opsi.gov.uk/si/si2006/20060599.htm>

4. Notified Body Appointments made under the Railway (Interoperability) Regulations

<http://www.dft.gov.uk/adobepdf/165234/349552/notified-bodies.pdf>

5. Railways (Interoperability) Regulations

Railways (Interoperability) Regulations 2006 (SI 2006/397)

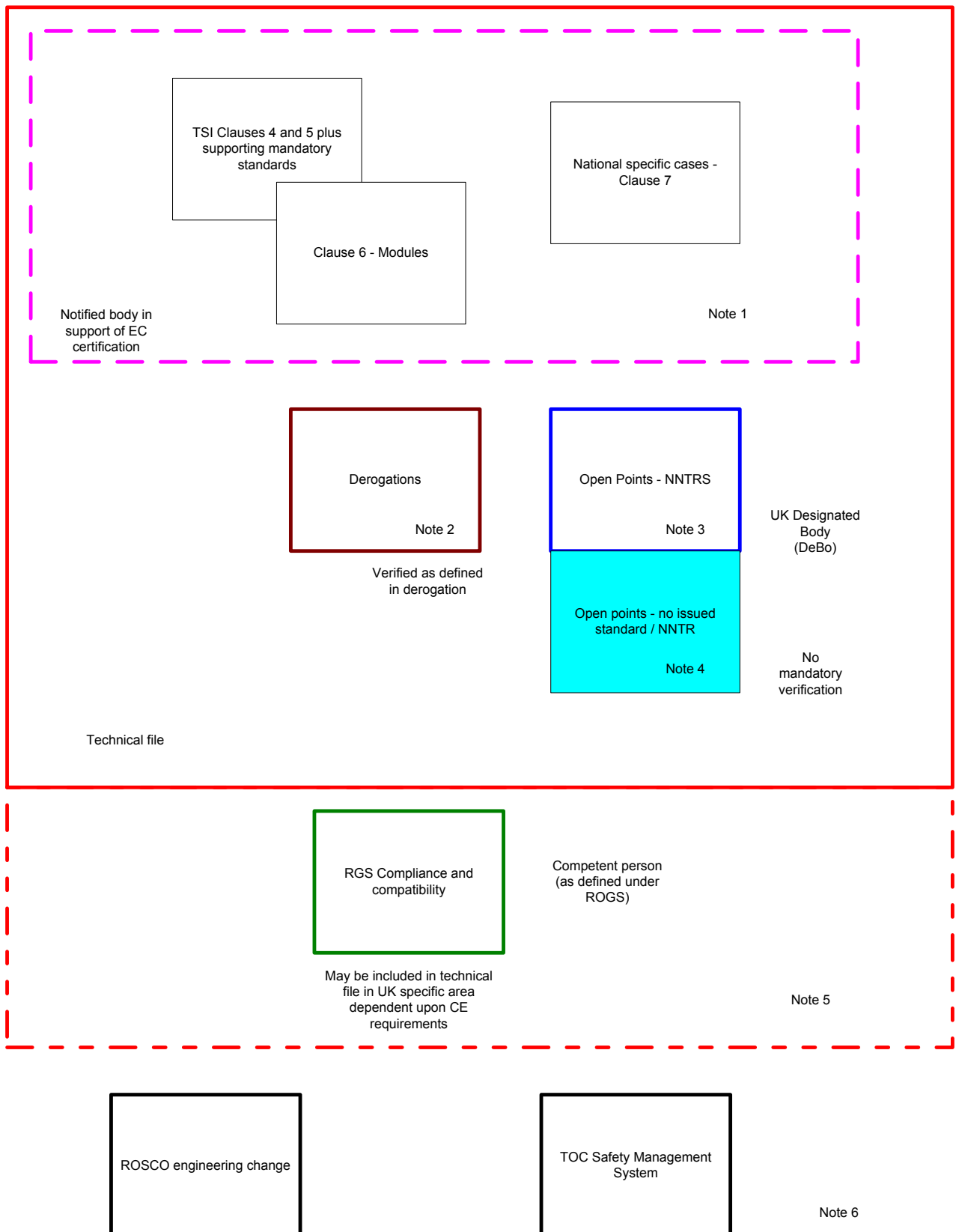
<http://www.opsi.gov.uk/si/si2006/20060397.htm>

Railways (Interoperability) (Amendment) Regulations 2007 (SI 2007/3386)

http://www.opsi.gov.uk/si/si2007/uksi_20073386_en_1


6. European Commission Regulation on the adoption of a common safety method on risk evaluation and assessment (2009/352/EC)

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:108:0004:0019:EN:PDF>



Verification Activities GSM-R First of Class fitment


- Mandatory content of technical file
- . - Content of technical file included at request of Contracting Entity
- - - Items that must be verified by Notified Body in order to raise EC certification

Note 1: Notified Body verification of compliance with TSI requirements (as they apply to the project) is described in the pink box marked  This is the core verification, which must be completed to permit the raising of the EC Certification for the on-board sub-system (GSM-R voice). This is the main content of the Technical File

Note 2: Any derogation raised on the project includes verification arrangements, whether this is by the Notified Body or some other means. The Notified Body must ensure that the derogations are included in the Technical File and list them on the certificate schedule. Evidence must be available that the derogations have been granted, before certification can be issued.

Note 3: Some open points are covered by Notified National Technical Rules (NNTRs). A UK Designated Body must verify that compliance with the NNTR has been demonstrated, and include the evidence in the technical file.

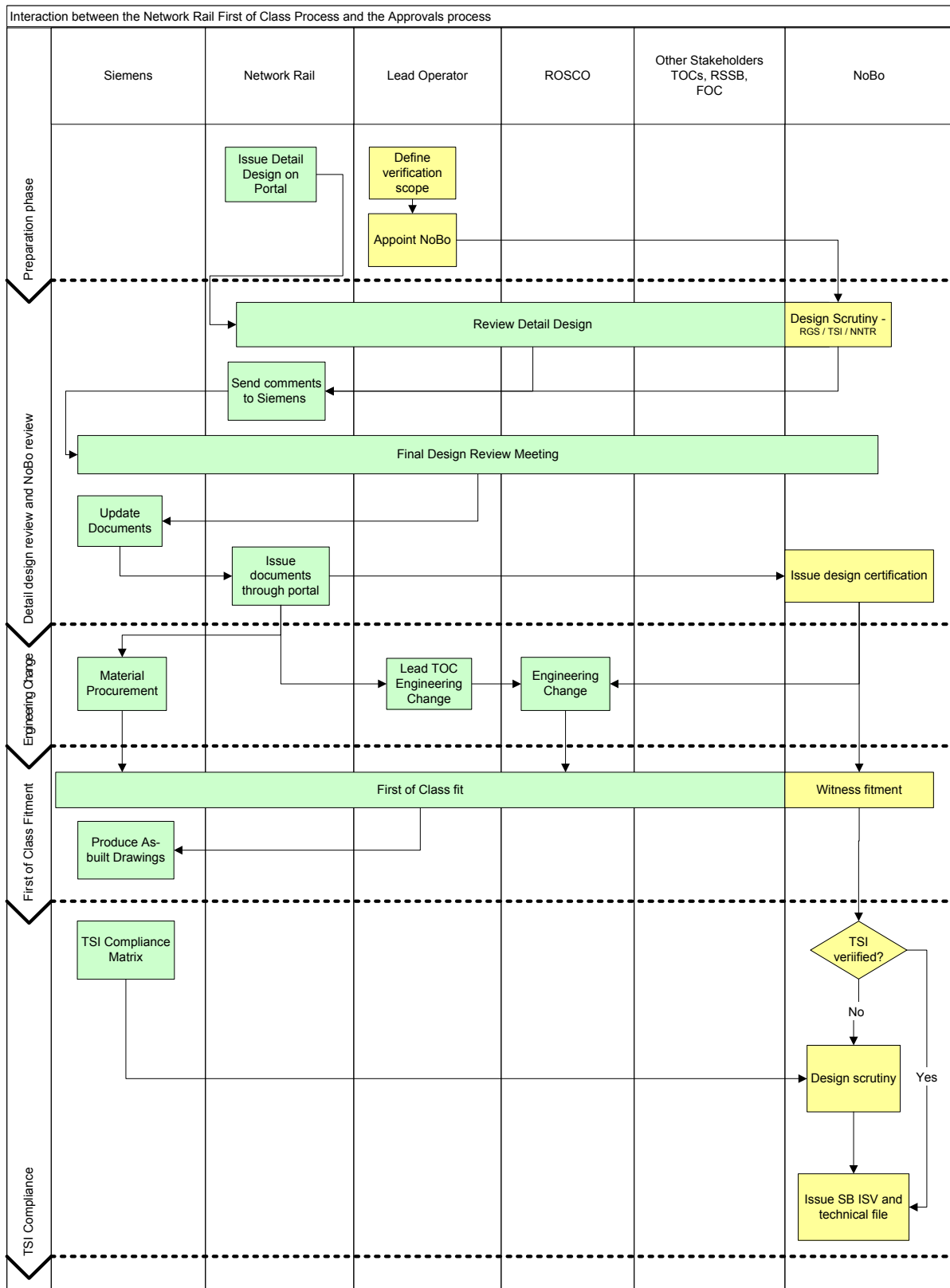
Note 4: If there are open points in the TSI that are not covered by an NNTR, then there is no verification required by a Notified Body. In the case of GSM-R, however, RSSB have stated that the list of NNTRs is complete for the Control Command and Signalling TSI and ORR have confirmed this.

The points covered in notes 2, 3 and 4 must all be recorded in the Technical File for submission to the Safety Authority. The extent of the technical file is represented by the solid red box 

Note 5: RGS compliance and compatibility can be demonstrated and verified by any competent person chosen by the Contracting Entity (CE). It is included in the technical file if so requested by the CE. ROGS defines a competent person as:

"a person with sufficient practical and theoretical knowledge as well as experience of the particular task, plant, machine, procedure, equipment (etc) involved to enable them to thoroughly examine and identify any defects or weaknesses during examinations, and to assess their importance in relation to the safety, function and continued use of the plant, machine, procedure, (etc again) and to be aware of their own particular limitations with regard to the task to be undertaken."

Note 6: There may also be specific verification required to satisfy the ROSCO or the TOC, this is outside the technical file. For further guidance, please refer to ATOC/ACOP/EC/1006 and the Train Operator's SMS.



Network Rail FoC process

FoC approvals process

List of mandatory specifications

Standard	Title	Assmt Std	Comment
EIRENE FRS Version 7.0	UIC Project EIRENE Functional Requirements Specification	Yes	
EN 50126 September 1999	Railway Applications - The specification and demonstration of reliability, availability, maintainability and safety (RAMS)		Derogation required
EN 50129 February 2003	Railway Applications - Safety-related electronic systems for signalling		Derogation required
EN50128:2001	Railway applications – Communication, signalling and processing systems – Software for railway control and protection systems		Derogation required
EN 50125-1 September 1999	Railway Applications - Environmental conditions for equipment - Part 1: Equipment on board rolling stock	Yes	
EN 50121-3-2, September 2000	Railway Applications - Electromagnetic compatibility - Part 3-2 : Rolling Stock	Yes	
EN 50238	Railway applications – compatibility between rolling stock and train detection systems	Yes	
EIRENE SRS Version 15	UIC Project EIRENE System Requirements Specification	Yes	Mandatory Items Only
ECC/DC(02) 05	ECC Decision of 5 July 2002 on the designation and availability of frequency bands for railway purposes in the 876-880 and 921-925 MHz bands	Yes	
GM/RT2472	Data recorders on trains	NA	Clause B4 – information to be recorded

List of NNTRs from DfT website

(<http://www.dft.gov.uk/pgr/rail/interoperabilityandstandards/interoperabilitystandards/nntrs/current-notified-rules/>)

Standard	Title	Assmt Std	Comment
GE/RT8015	Electromagnetic compatibility between railway infrastructure and train	Yes	Whole document
GE/RT8270	Assessment of compatibility of rolling stock and infrastructure	Yes	Whole document
GE/RT8080	Train radio system for voice related message systems	Yes	Parts 3, 4.1 to 4.4 and 4.7, 5, 6, 7, 8
GE/RT8082	GSM-R Cab Mobile, Great Britain Open Interface Requirements	Yes	Associated GE/GN8582

Notified Body verification

The Control, Command & Signalling TSI identifies three options available to the contracting entity for independent verification of the on-board sub-system. (In this case, the sub-system is GSM-R Voice radio)

SB and SF

SB and SD

SH2

These are described further below.

SB (Type Examination)

The Notified Body checks and certifies that an example of the installation meets the requirements of the Control Command and Signalling TSI and associated TSIs. The type offered for scrutiny must be representative of future production. This involves:

- scrutiny of the first of class design against the TSI, NNTR and mandatory standards
- type examination during installation, and
- type test.

SD (Production Quality Management System)

The Notified Body checks and certifies that installation of the cab mobile is routinely carried out in accordance with the design and instructions covered by the SB certificate, by verifying that a quality management system is in place for the production phase of the project. Installation of the cab mobile includes verification that components and sub-assemblies, which are not defined as interoperability constituents, meet the TSI requirements (e.g. antenna, DMI etc) and those components, which are interoperability constituents, have the necessary certification confirming their compliance. Testing and commissioning activities are also reviewed, as appropriate.

This involves ensuring that all parties involved in the production phase, operate quality management systems, which assure compliance with the TSI requirements as they apply to their scope of activity. Each organisation may choose to appoint their own notified body to verify that their production quality assurance for the installation meets the requirements of the TSI. For example, Siemens may choose to ask their Notified Body to audit the installation of GSM-R on the Class 320 and subsequently extend their scope to cover other classes of vehicle as the type examination certificates are issued.

The Notified Body for the subsystem either reviews the audits carried out by other notified bodies, or carries out audits of the management systems of all parties involved.

SF (Product Verification)

The Notified Body verifies compliance to the TSI by examination and testing of each and every vehicle, to confirm that the design features and installation requirements covered by the SB certification have been met and that the completed works comply with the TSI requirements.

SH2 (Full Quality Management System with Design Examination)

The Notified Body verifies that all parties involved in the design, manufacture and final product inspection and testing operate quality management systems to ensure that the installation complies with the TSI requirements. As part of this, a design examination of compliance with the TSI requirements is also completed.

First of Class Fitment – Recommended Module

The cab radios are removed from the vehicles once the first of class fitment is complete, therefore it is only necessary to assess the design element and examination of type.

The most appropriate module for this activity is:

SB – type examination, design scrutiny, build conformance and testing.

An interim statement of verification for the type examination can be issued for each first of class design.

Fleet Fitment – Choosing appropriate verification modules

In order to raise EC certification a Notified Body must verify that the TSI requirements are met at both the design stage and during production. This ensures that the sub-system is designed to meet the Technical Specification of Interoperability and production arrangements ensure that the vehicles are fitted in accordance with the approved design. The first of class process will create a technical file and Type Examination – Intermediate Statement of Verification (Module SB).

The CCS TSI provides for three possible methods of verifying compliance. The following section outlines the pros and cons of each approach.

SB and SF

The product verification module (SF) requires inspection and testing of every vehicle fitted with GSM-R. Therefore, it can be labour intensive, resulting in a numerous site visits.

Once the type examination ISV is issued, under module SF all subsequent vehicles would need to be examined individually, which for a large fleet could result in a significant number of verification visits. It is likely that only TOCs with a very small fleet of vehicles would adopt the Product Verification module SF for subsequent fleet fitment.

SB and SD

The Production Quality Assurance module (SD) recognises that the work is carried out in accordance with a quality management system. Certification is issued which references the Type Examination certificate. Each party involved in the installation and testing is assessed.

Each party can maintain their own Production Quality Assurance Certification by employing their own Notified Body to carry out the assessment. The Notified Body for the On-Board Subsystem would review the audit reports for each of the parties.

Once approved, it is possible to extend the scope of their certification by demonstrating that their management system has been extended to cover additional types of vehicle / design. An extension to scope takes less verification than required for a new management system certification.

Therefore, as an example, Siemens could request their Notified Body to assess the installation of the Class 320 and raise a Production Quality Assurance certificate for Installation of GSM-R on Class 320. They could then ask for the scope to be extended to include installation on Class 156, Class 314 and Class 43. The notified body would carry out a reduced audit to ensure that the specific requirements of the design for these classes of vehicle have been added to the approved Quality Management System.

Once an organisation is approved under module SD for a particular type of installation design, they are able to continue to carry out this work without additional verification for each vehicle. However, they must be subject to at least annual surveillances, to check that the quality management system is being applied.

SH2

The SH2 module involves a full assessment of the quality management system controlling design, manufacture, inspection and test of the on-board subsystem. In addition, the Notified Body must carry out a design review of the compliance of the on-board subsystem against the TSI requirements.

If the Contracting Entity chooses to follow the SH2 module, then the assessment of the QA system in relation to design allows some flexibility to make changes. Note: With SH2, it is not necessary to examine an example of type. It is the Contracting Entity's responsibility to reappoint a notified body if it considers that the change is outside the scope of the original certification. SH2 does not allow an inspection based approach to the production phase. The Contracting Entity must adopt a management system throughout the realisation life cycle.



Intermediate Statement of Verification^{*}

Reference: 0038/0//SB/2009/CCS/ENEN/20090002A

The following Subsystem (as detailed in the attached schedule):

ERTMS / GSM-R On-board

GSM-R Voice Cab Mobile Generic Installation

(as described in section 4 of the Technical File)

of Applicant:

ScotRail
Atrium Court
50 Waterloo Street
Glasgow
G2 6HQ

has been assessed by:

Lloyd's Register Verification Ltd
71 Fenchurch Street London EC3M 4BS UK

The attached schedule details the assessments made at the date of issue of this statement, pursuant of the EC Verification process of Council Directive 2001/16/EC of 19th March 2001 on the interoperability of the trans-European conventional rail system as amended by Council Directive 2004/50/EC of 29th April 2004. These Assessments have been performed by application of Module(s) SB of the relevant TSI (as defined in the Regulations) adopted pursuant to the Regulations.

The assessments are with respect to the design, ratings and operational parameters described in the schedule.

Date of Issue: 16 August 2009

Signature

On behalf of Lloyd's Register Verification

Name: Simon Emeny

Title: Product Conformity Manager

^{*} This Statement documents, at the request of the Contracting Entity, the current state of Notified Body Verification at an arbitrary point in the EC Verification Process. It does not constitute any part of an EC certificate under Council Directive 96/48/EC or Council Directive 2001/16/EC.



Schedule to Intermediate Statement of Verification

0038/0//SB/2009/CCS/ENEN/20090002A

Subsystem

ERTMS / GSM-R On-board

GSM-R Voice Cab Mobile Generic Installation

(as described in section 4 of the draft Technical File)

of Applicant:
First ScotRail

Key Characteristics of subsystem against which assessments have been made:

Environmental and Physical Conditions

Electromagnetic Compatibility

GSM-R Functional Requirements

Ergonomic aspects of the DMI

Voice Related Messaging Systems

Use of Annex B systems

The assessments have been made on the basis that the following Restrictions apply to the SubSystem:

The scope of assessment covers GSM-R cab mobile installation for voice usage only, in relation to those Key Characteristics listed above.

The GSM-R Cab Mobile has only been tested with the Network Rail Infrastructure.

Notable exclusions from the assessment scope (defined in Section 4 of the Technical File) are as follows:

- Compliance of the SIM card, which is considered to be part of the Infrastructure, although not yet included in the GSM-R Infrastructure assessment scope.
- GSM-R as a bearer for data services, including ETCS,
- Items relating to train control subsystems (ETCS, train detection, HABD etc),
- Maintenance Arrangements on a Class Specific basis
- The assessment does not include the OTMR interface

Date of Issue: 16 August 2009

Signature

On behalf of Lloyd's Register Verification

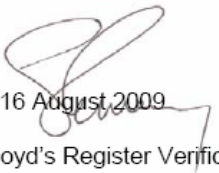


The Cab Mobile does not meet the requirements of GE/RT8081 in the following area:

GE/RT8081 clause	Compliance status	Description	Comment
3.3.6	Non-compliant	Use of GSM service Call Forwarding on No Reply (CFNRy) for call forwarding	A Temporary Non Compliance has been agreed by RSSB regarding change from call forwarding on no reply to call forwarding unconditional. Siemens has requested (via Network Rail) that the 8081 standard is changed to reflect the radio operation as CFU is more appropriate than CFNRy. Note that RT8082 section 3 8.3.5 call up Call Forward Unconditional (CFU).


The Cab Mobile does not meet the requirements of GE/RT8082 in the following areas:

GE/RT8082 clause	Compliance status	Description	Comment
2.3.1.3	Compliant with comment	Requirement: Display to show "stop emergency"	STOP EMERGENCY is displayed (i.e. uppercase) as defined by Human Factors study. It is suggested to modify the RGS to clarify this point
2.4.2.1, 2.6.3.4 & 3.7.5.2 & table 3.9, 4.6.1.3	Compliant with comment	Incoming pre-defined text messages "Registration failed"	Message is not displayed, but stored in the Inbox. It is proposed to remove the "registration failed" UUS message as it is not a message that is ever used in the UK network now.
2.4.2.3	Non-Compliant	UUS Message text display time	The performance of the radio has slowed with the introduction of 1 D due to the need to decode the UUS message and analyse it prior to displaying it. Typical delay between initial indication of the message (on the AT interface) and the HMI displaying the message is 5s. This applies to 'Contact Signaller' and 'Wait' messages. Suggest that the RGS is modified.

Date of Issue: 16 August 2009
 Signature 
 On behalf of Lloyd's Register Verification



2.4.3.7 and 2.4.3.9, 4.2.4.1, 2.6.3.5, 4.2.5.7, 4.2.6.1 and 4.2.6.2, 4.5.1.1, 4.7.1.1, 4.7.1.2	Non-Compliant	Display of unsuccessful UUS messaging	Non compliant - Due to the network not supporting sending of UUS in the disconnect phase, the full handshake capability of the UUS protocol could not be implemented in the "1E" cab mobile software release. The "1E" radio operates as "fire and forget" type protocol. A temporary non compliance is requested to this item as it is intended to resolve this by implementing a modified handshake protocol in the "V2" (next major release) cab mobile.
3.9.7.4	Compliant with Comment	Volume setting during audio quality testing	Compliant with comment: -16dBm0 should be the average level from the network simulator. The RGS should be amended with this correction.
3.7.7 (Tables 3.5.3.6, 3.7.3.8.3.9)	Partial Compliance	Tones for audible indications	The tones in the standard have been modified through the project Human Factors work. The tones in the 1E radio are the latest required tones. The RGS should be updated to match the standard.
3.9	Partial compliance	Speech quality at the acoustical interface	Siemens has conducted testing (using specialist test house) according to 8082 specified method. Testing has been performed. Results document available. It is suggested to modify the RGS to incorporate achievable values
4.2.4.2	Not Applicable	Acknowledgement of Incoming messages	Compliant with comment. All received UUS pre-defined messages are intended to be acknowledged, therefore suggest to remove this requirement.
4.9(4.9.1 1 4.9.2.1, 4.9.22, 4.9.2.3)	Non Compliant	DSD acknowledgement	This clause relates to messages which are not in the current EIRENE specification. Propose standards change to bring UK in line with European position.

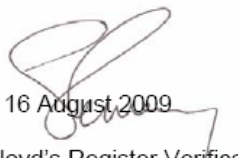

 Date of Issue: 16 August 2009
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4.11.1.2, 4.11.1.3, 4.11.1.4, 4.11.2.1, 4.11.3.1 4.11.3.3 4.11.4.1 4.11.5.1 4.11.5.2 4.11.5.3	Out of scope for Cab Radio alone	Key performance indicators for the network	Key performance indicators for the Network - This section specifies requirements on the end to end system and not the Cab Mobile itself. These requirements are addressed by the assessment of the Network against GE/RT8082 which is beyond the scope of this GSM-R Cab Mobile assessment
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The Cab Mobile does not meet the requirements of RIS-3082-CCS in the following areas:

RIS-3082-CCS clause	Compliance status	Description	Comment
2.5.1.4	Non-Compliant	Default value of timers td and tw	Each of these timers is now set to 30s at network Rail's request. A standard change is requested for this item.
2.6.6.7	Non-Compliant	Timer Tp adjustment	RS Timer Tp, the time for which a "Keep registration" prompt is retained, is not adjustable. A temporary non compliance is applied for.
2.7.4.4	Non-compliant	Speed of directory information presentation	The presentation of data extracted from the directory requires typically 3s from the initiation of the search task rather than 1s. A modification to the RIS is suggested because with V2 cab mobile the "core directory" will no longer be used. It will become obsolete due to the introduction of the use of EPFN in order to send the calling party text id at the time of call establishment
2.8.3.1	Partially compliant	Fault indications	A visual indication is given, but not an audible one. A derogation or standards change is requested.
2.8.5.3	Partially Compliant	Power up self test indications.	Timer adjustment is not included in 1E. Included in Version 2 scope, A temporary non compliance is applied for
2.8.6.1 to 2.8.6.4 and 2.8.1.4	Non Compliant	HMI Activation self-test results	HMI activation self-tests currently do not include attached systems. Included in Version 2 scope. A temporary non compliance is applied for

Date of Issue: 16 August 2009

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2.8.8.3	Partially Compliant	User-initiated self test indications.	Timer adjustment is not included in 1E. Included in Version 2 scope. A temporary non compliance is applied for
2.8.9 (2.8.9.1 to 2.8.9.10)	Non Compliant	Fault Codes	Fault codes are not logged. Faults are indicated to the driver so manual logging can occur until such time as the functionality is available. Included in Version 2 scope. A temporary non compliance is applied for
2.8.11.3	Partially Compliant	Configurable attributes	Timers relating to 2.8.5.3 and 2.8.8.3 are not included in 1E (see elsewhere in this table). Included in Version 2 scope. A temporary non compliance is applied for. The timer relating to 4.2.5.1 is fixed at 20 seconds with 1E. Note that the standard states 10 seconds default value which is the value which was initially used but found to be too short, therefore the standard should be changed to 20 seconds. 3.7.2 Not configurable in 1E, included in V2 scope. 4.2.5.1 Not configurable in 1E, included in V2 scope A temporary non compliance is applied for 2.8.5.3, 2.8.8.3, 3.7.2 & 4.2.5.1. The timer relating to 5.2.2 is not offered as a software configurable item. This is set in hardware in the UPS. A derogation is requested with the STS UPS for 5.2.2. 2.5.1.2 and 2.5.1.3. The default values are set to 30s. A standard change is requested for these items.
3.2.2.4	Non Compliant	Emergency and Urgent button spacing should be at least 13mm	The urgent call button is edge is 8mm from ST button. However there is a protective shroud however which prevents inadvertent operation of the incorrect button. A standard change is requested for this item.
3.2.2.10	Non Compliant	Physical control spacing should be at least 9mm	Spacing between buttons on the row beneath the screen are 8mm. A standard change is requested for this item.


 Date of Issue: 16 August 2009
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3.7.4 3 3.7.5.2	Non Compliant	Indications associated with the handling of pre- defined text messages	Due to the network not supporting sending of UUS in the disconnect phase, the full handshake capability of the UUS protocol could not be implemented in the "1E" cab mobile software release. The "1E" radio operates as "fire and forget" type protocol. A temporary non compliance is requested to this item as it is intended to resolve this by implementing a modified handshake protocol in the "V2" (next major release) cab mobile
3.7.3.1 Table	Partially compliant	Broadcast display	The 1E radio displays "Broadcast". In V2 cab mobile this will be changed to "General Broadcast". A temporary non compliance is requested.
3.7.6.1	Partially Compliant	Display of messages	Compliant except that the Registration Failed Message is not immediate display - it is stored in the inbox if received. However note that there is no mechanism by which it will be received with 1E cab mobile. The message is requested to be removed in the standards because it is no longer needed with a V2 radio (as V2 radio generates its own head code).
3.8.1.5	Non Compliant	Shunting without driver's key	The shunting menu can also be used without a driver's Key. A standards change is requested on this issue.
3.8.3.3	Non Compliant	Menu names and structure	The menu listed in the RGS is not the latest version being proposed by the HMI working group. A standards change is requested on this issue.
4.3.1	Non Compliant	Fax	Fax is not implemented in UK Cab Mobile by agreement with Network Rail. A derogation or temporary non-compliance will be applied for.
5.2.3.3	Compliant with Comment	Timer T _{batt} adjustment	The period T _{batt} is set with hardware. It is configurable with a hardware modification. A derogation is requested against the group standard
5.5.3. 1 and 5.2.4.12 And 5.8.1	Non Compliant	Data sent to OTMR	Included in Version 2 scope. A Temporary non compliance is applied for


 Date of Issue: 16 August 2009
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**Details of associated Interoperability Constituents:**

SVR400 GSM-R Cab Radio Network Rail Product 1E:

Pt No: 666/1/85073/121 - Kapsch

Pt No: 666/1/85073/100 – Sagem

Siemens Mobility – EC Declaration of Conformity – 09/003 dated 5th August 2009**List of Standards against which assessments have been made:**

Standard Number	Title	Revision
EIRENE FRS	UIC Project EIRENE Functional Requirements Specification	Version 7.0
EN 50125-1	Railway Applications - Environmental conditions for equipment - Part 1: Equipment on board rolling stock	September 1999
EN 50121-3-2,	Railway Applications - Electromagnetic compatibility - Part 3-2 : Rolling Stock	September 2000
EN 50238	Railway applications – compatibility between rolling stock and train detection systems	May 2003
EIRENE SRS	UIC Project EIRENE System Requirements Specification	Version 15
ECC/DC(02) 05	ECC Decision of 5 July 2002 on the designation and availability of frequency bands for railway purposes in the 876-880 and 921-925 MHz bands	5 July 2002
GE/RT8015	Electromagnetic compatibility between railway infrastructure and train	Issue 1
GE/RT8270	Assessment of compatibility of rolling stock and infrastructure	Issue 2
GE/RT8080	Train radio system for voice related message systems	Issue 1
GE/RT8082	GSM-R Cab Mobile, Great Britain Open Interface Requirements	Issue 1

List of Approved Documents against which assessments have been made:

See Technical File Section 5

List of Technical Approvals and other certification

See Section 2 of the Technical File

Assessments made to date:

Date of Issue: 16 August 2009

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Description	Report Ref	Assessment Status (Complete/ Estimated Completion Date)
Generic assessment of GSM-R Fitment EMC	2612rpb080801	Complete
Review of compliance with UK NNTRS	69534cmn090415	Complete
Review of UK GSM-R Cab Radio Component Assessment	69534cmn090415	Complete

Further assessments Planned: None

Other Observations, Issues, etc:

EMC compliance can be demonstrated for each fleet providing the following constraints described in Interface Control Document 666/UJ/86001 Issue 05 are met:

- The routing of cables is in accordance with the Siemens recommendations
- The GSM-R antenna location on the roof is an acceptable distance from any other antennas.

Date of Issue: 16 August 2009

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F-1 – Typical Submissions for Design Scrutiny against TSI, NNTRs and RGS

Item	Requirement	Document reference(s)
	Documents in support of Voluntary Independent Verification	
1	Drawings	
a	Wiring / Interconnection drawings – including power supply, cable runs, number, identity and size of cables and cable connectors	
b	Schematic diagrams for installation of GSMR including power supply	
c	Revised Cab Layout drawings showing position of new cab equipment	
d	Cab equipment mounting arrangement drawings	
e	Antenna Mounting arrangement drawings	
f	Radio rack mounting arrangement drawings	
g	Manufacturing drawings – brackets, closure plates etc	
h	On-train equipment interconnection details	
2	Cable schedule	
3	Materials inventory	
4	Installation procedure	
6	Assessment of risks to vehicle electrical systems	
7	Installation document register	
8	Calculations – structural calculations for equipment and enclosure mountings	
9	High level risk assessment and hazard log	
10	VMI – maintenance information	
11	Test specification	
12	Clause by Clause compliance against:	
a	GE/RT8081 – Requirements for GSM-R Voice Radio System	Mainly generic but some TOC specific operational issues
b	GE/RT8080 – Train Radio Systems for Voice and related messaging communications	Mainly generic but some TOC specific operational issues
d	GM/RT2100 – Structural requirements for Railway Vehicles	
e	GM/RT2120 – Requirements for the control of risks arising from fires on railway vehicles	
f	GM/RT2149 – Requirements for defining and maintaining the size of railway vehicles	
g	GM/RT2161 – Requirements for driving cabs for railway vehicles	
h	GM/RT2300 – Warning signs and labels fitted to electrical equipment on rail mounted vehicles	
i	GM/RT2304 – Equipotential bonding of railway vehicles to running rail potential	
	Documents in support of TSI Compliance	
13	Generic Intermediate Statement of Verification and supporting technical file	
14	Evidence of compliance with EMC constraints listed in generic technical file	
15	Class specific TSI compliance matrix	

F2 - Command, Control & Signalling (CCS) Technical Specifications for Interoperability (TSIs).

SB Module (Type Examination) Technical Documentation Submissions.

General

Use this checklist to help judge whether your GSMR installation project is ready for assessment against the SB Module of the Command, Control & Signalling (CCS) Technical Specifications for Interoperability Regulation (TSI). Indicate the document reference, including revision status for each item. In addition to the desktop review of the submissions referenced below, the notified body will examine each first of class vehicle as the 'Type' for that class. NOTE: the type can be representative of several versions of the design, as long as the differences do not affect the provisions of the TSI.

CLASS				Vehicle No:	
No.	Requirement	Met? Y/N	Reference & Evidences	Guidance	
1	<i>The technical documentation and specimen(s) must enable the design, manufacture, installation, maintenance and operation of the subsystem to be understood, and shall enable conformity with the provisions of the TSI to be assessed.</i>			It is recommended that you complete a clause by clause response against the relevant TSI requirements, identifying the evidence available to demonstrate compliance. A compliance matrix is available for this purpose as part of the generic technical file.	
2	The technical documentation must include: ▪ a general description of the subsystem, overall design and structure			The overall description of the subsystem, overall design and structure	
3	▪ <i>the Rolling Stock (subsystem) register, including all information as specified in the TSI</i>			The TSI requires that both GSM-R and train specific information such as geometry needs to be recorded. (NA at first of class stage) RSSB TN041 identifies the preferred method of notifying RSL	
4	▪ <i>conceptual design and manufacturing information, for example drawings, schemes of components, sub-assemblies, assemblies, circuits, etc</i>			This should include the suite of drawings and installation procedures, which define the design for the Class, these are the documents submitted at the concept design stage. Form – Appendix F1 gives a list of typical documents required for submission.	
5	▪ descriptions and explanations necessary for the understanding of the design and manufacturing information, the maintenance and the operation of the subsystem			This will typically be available in the installation, maintenance and operating instructions. Detailed commentary is unlikely to be needed, although reference could be made to The Operational Concept	

6	<ul style="list-style-type: none"> the technical specifications, including European specifications, that have been applied 	Y	Standard list - ACOP/EC/01009 Appendix C	
7	<ul style="list-style-type: none"> any necessary supporting evidence for the use of the above specifications, in particular where European specifications and the relevant clauses have not been applied in full 			List of derogations applicable to the project: Use of Yellow Book instead of EN50129 / EN50128 / EN50126
8	<ul style="list-style-type: none"> a list of the interoperability constituents to be incorporated into the subsystem 		Siemen's GSM-R product SVR400 – version 1E	There is one Interoperable Constituent – the GSM-R Cab Mobile.
9	<ul style="list-style-type: none"> copies of the EC declarations of conformity or suitability for use of interoperability constituents and all the necessary elements defined in annex VI of the directives 		ISV 0038/0/SB/2009/CCS/ENEN/20090002A	The conformity of other generic equipment not included in the Cab Mobile certification are included in the Generic Technical File
10	<ul style="list-style-type: none"> evidence of conformity with regulations deriving from the treaty (including certificates) 			From the IC certification, it will include certification for R&TTE and other directives. The conformity of other generic equipment not included in the Cab Mobile certification are included in the Generic Technical File
11	<ul style="list-style-type: none"> technical documentation regarding the manufacture and the assembly of the subsystem 			Final drawings and installation instructions. (As built drawings) Form –Appendix F1 gives a list of typical documents required for submission.
12	<ul style="list-style-type: none"> a list of manufacturers, involved in the subsystem's design, manufacturing, assembly and installation 			List of parties involved on the project, covering Design Manufacturing Installation Typically referenced in the scope definition document
13	<ul style="list-style-type: none"> conditions for use of the subsystem (restrictions of running time or distance, wear limits etc), 			This will be an output from the trial and any restrictions identified.

14	<ul style="list-style-type: none"> conditions for maintenance and technical documentation regarding the maintenance of the subsystem 			Typically VMIs, Maintenance Plans, Bulletins, including details of special tools
15	<ul style="list-style-type: none"> any technical requirement that must be taken into account during production, maintenance or operation of the subsystem 			RSSB issued Operating Rules, local Operating Instructions, installation procedures and maintenance instructions User Manuals and Technical Handbook.
16	<ul style="list-style-type: none"> results of design calculations made, examinations carried out, etc 			Typical calculations required: See Appendix F1– Installation records
17	<ul style="list-style-type: none"> test reports 			Type testing reports, EIRENE testing reports. (Some may be generic)