



OFFICE OF **RAIL REGULATION**

THE RAILWAYS AND OTHER GUIDED TRANSPORT  
SYSTEMS (SAFETY) REGULATIONS 2006 (ROGS)

**A GUIDE TO SAFETY VERIFICATION FOR  
TRAMWAYS**

**OCTOBER 2008**



# Contents

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<b>Foreword</b> .....	<b>5</b>
What is the purpose of this guide? .....	5
<b>1. Glossary of terms</b> .....	<b>7</b>
<b>2. Introduction</b> .....	<b>13</b>
Background to ROGS.....	13
What do ROGS require? .....	13
<b>3. Deciding if safety verification is needed</b> .....	<b>17</b>
When is safety verification required? .....	17
Further advice.....	21
<b>4. The independent competent person</b> .....	<b>23</b>
Who can be an independent competent person? .....	23
What is the role of the ICP?.....	23
When should an ICP be appointed? .....	23
Should ICP be insured?.....	26
<b>5. The safety verification process</b> .....	<b>27</b>
What does the SV scheme need to include? .....	27
The ICP's assessment.....	31
What records should a transport operator or responsible person keep? .....	33
<b>Annex 1: Decision chart for selecting an independent competent person</b> ...	<b>35</b>
<b>Annex 2: Case studies</b> .....	<b>37</b>



# Foreword

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## What is the purpose of this guide?

This guide provides advice on the safety verification requirements in the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS). It builds on our Crystal Mark guide to ROGS explaining what the regulations require, which can be found at:

[http://www.rail-reg.gov.uk/upload/pdf/342-ROGS\\_gdnce\\_nov07.pdf](http://www.rail-reg.gov.uk/upload/pdf/342-ROGS_gdnce_nov07.pdf)

This guide explains:

- why safety verification has been introduced;
- the main changes that safety verification introduces;
- when safety verification is required and when it is not;
- how an independent competent person can help;
- the practical steps you can take to meet your responsibilities; and
- ORR's role

Operators may find it helpful to read the guide alongside a copy of the regulations. The full text of the regulations is available at:

[www.opsi.gov.uk/si/si2006/uksi\\_20060599\\_en.pdf](http://www.opsi.gov.uk/si/si2006/uksi_20060599_en.pdf)

## Who is this guide for?

This guide is primarily for operators and promoters of tramways.

Persons or organisations who provide advice to tramway operators or promoters of tramways on the safe introduction of vehicles or infrastructure may find the section on the roles and responsibilities of the independent competent person useful.

This guide concentrates on the requirements in ROGS for introducing new or altered vehicles or infrastructure. Further guidance on ROGS and other legislation is available from the ORR website at:

[www.rail-reg.gov.uk](http://www.rail-reg.gov.uk)

ORR has also published guidance about safety verification for heritage railways. It is recommended that operators of heritage tramways refer principally to this tramways guide.

Operators can ask us any questions about the guidance at:

[rogs.guidance@orr.gsi.gov.uk](mailto:rogs.guidance@orr.gsi.gov.uk).

### Note on the text

Each chapter has the same format. They each:

- say what specific regulations apply;
- explain who the duties apply to;
- describe what the person responsible for carrying out that duty **must** do;
- provide some practical advice or examples for meeting the duties; and
- explain where to get more information or detailed process manuals.

The information in plain text explains what the regulations say and what operators must do.

The text in shaded boxes is meant to offer guidance, examples or practical help.

The small boxes in the left-hand margin show which specific part of ROGS the text alongside it is explaining.

- 'Reg' refers to a regulation of ROGS, or part of one.
- 'Sch' refers to a schedule to ROGS, or part of one.

**The Office of Rail Regulation (ORR) has issued this guidance. Following the guidance is not compulsory and operators are free to take other action. The guide aims to help people who may be affected by the regulations to understand their responsibilities under the regulations.**

**This guide is regularly updated. The version on the ORR website shows the date of the latest update. If users have any suggestions for improvements, please contact [rogs.guidance@orr.gsi.gov.uk](mailto:rogs.guidance@orr.gsi.gov.uk). Where major changes are proposed, we will consult before formally updating this guide.**

# 1. Glossary of terms

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Reg 2

- 1.1 Regulation 2 of ROGS gives the full legal definition of most of the terms used in the regulations. This guide gives a simple explanation of terms when they are first used in the main body of the text. These explanations do not replace the full legal definitions in the regulations.
- 1.2 **‘Competent person’** (or ‘independent competent person’) means a person who
- has sufficient skills, knowledge, experience and resources to undertake the safety verification in relation to which he is appointed; and
  - is able to look at the project objectively.
- 1.3 **‘Heritage tramway’** means a tramway which is operated to:
- preserve, re-create or simulate tramways of the past; or
  - demonstrate or operate historical or special types of motive power or rolling stock; and
  - is exclusively or primarily used for tourist, educational or recreational purposes.
- 1.4 **‘Infrastructure’** means fixed assets used for running a transport system, including:
- the permanent way or any other method of guiding or supporting vehicles;
  - bridges and tunnels;
  - any passenger stop, station or terminal (including a tramstop);
  - fixed equipment used for signalling, communications etc.; and
  - fixed equipment used only for supplying electricity to run the transport system.

1.5 **'New'** in relation to regulation 6 of ROGS (concerning safety management on other transport systems) means new to the transport system in question.

1.6 **'Railway'** means a system of transport using parallel rails which:

- provide support and guidance for vehicles carried on flanged wheels; and
- form a track which has a gauge of at least 350 millimetres **or** crosses a carriageway (whether or not it is on the same level).

'Railway' does not include tramway.

1.7 **'Significant safety risk'** means, in relation to ROGS and safety verification (SV) new or altered infrastructure or a new or altered vehicle, the design or construction of which incorporates significant changes compared to any infrastructure or vehicle already in use on the transport system. And these changes have the capability of significantly increasing an existing safety risk or creating a significant safety risk to:

- passengers on the transport system in question; or
- members of the public

1.8 **Staff** includes employees and volunteer workers.

1.9 **'Station'** includes a passenger stop, station or terminal on a transport system. Where stops are part of the pavement then the extent of the stop is that part of the pavement that is under the maintenance of the tramway infrastructure manager. As a minimum it would include the full length over which platform edge tactile paving is used plus any ramping up from surrounding footway level and to the maximum width occupied by stop equipment.

1.10 **'Tramway'** means a system of transport:

- which is used completely or mainly to carry passengers;
- where the maximum speed allows the driver to stop a vehicle in the distance he can see to be clear ahead; and
- which uses parallel rails which:
  - provide support and guidance for vehicles carried on flanged wheels; and
  - are laid completely or partly along a road or in any other place to which the public has access (including a place where the public has access only after making a payment)



- 1.11 **'Transport system'** mainly means a railway (mainline or non-mainline), a tramway, or any other guided transport system used completely or mainly to carry passengers. Guided buses and trolleybuses are excluded from ROGS. The other excluded systems are listed in regulation 2 of ROGS.
- 1.12 **'Vehicle'** means any tramcar, locomotive, carriage, wagon, mobile traction unit or rail-based vehicle used on a transport system.

*Who has duties under ROGS?*

- 1.13 A **'transport undertaking'** is any person or organisation that operates a vehicle in relation to any infrastructure. Persons or organisations that only carry out work in 'engineering possessions' (this means sections of track that are closed to normal movements of trams for maintenance work, usually known as 'occupations' on tramways) are not included in the term 'transport undertaking'. So although some of the duties in ROGS (eg on safety critical work) apply to those working only in engineering possessions, the requirement for safety verification would not normally do so.
- 1.14 An **'infrastructure manager'** is any person or organisation that:
- is responsible for developing and maintaining infrastructure (not including a station or tramstop) or for managing and operating a station or tramstop; and
  - manages or uses that infrastructure or station/tramstop or allows it to be used for operating a vehicle.

*This box outlines the general approach taken by ORR to defining the roles and responsibilities under ROGS. There is not a one-size fits all solution for tramways in the UK, so please consult ORR if you have any doubts about the application of the legislation.*

**Infrastructure manager**

The question of who is the infrastructure manager will depend on the contractual division of responsibility between the parties involved.

A contractor engaged by a promoter to construct an extension to an existing

system, **and** to maintain it for a defined period of time may be deemed to be responsible for developing and maintaining the system. If the responsibility of the contractor only extends to **either** maintenance **or** construction, they would not be an infrastructure manager. In this instance we would look to the person who let the maintenance/construction contracts.

The ‘allowing vehicles to operate’ test for the infrastructure manager generally relates to the person who has day to day control of the infrastructure, and who has the power to stop tramcars using the infrastructure. We would not regard a passenger transport executive as ‘allowing vehicles to operate’ on the basis that they have given a contract to the transport operator.

### Highway Authorities as Infrastructure Managers

We do not believe that highway authorities would routinely meet the test for infrastructure managers. If an operator or responsible person believes that there are circumstances where this is the case, they should discuss this with ORR who will be willing to advise.

Reg  
6(6)

- 1.15 A ‘**transport operator**’ means any transport undertaking or infrastructure manager.
- 1.16 In the absence of a transport operator a ‘**responsible person**’ will be required to meet the duties of the transport operator. A ‘responsible person’ means any person or organisation who:
- has contracted another person or organisation to make or build vehicles or infrastructure; or
  - makes or builds vehicles or infrastructure for his own use or for sale to or for the use by another person or organisation, except where he is contracted to do so.

- 1.17 In this document, 'operator' means any 'transport operator' or 'responsible person'.

### **Transport Operators**

For the purposes of ROGS, a transport operator does not exist until passengers are carried on a system. For a new system this means that a responsible person would be responsible for carrying out safety verification.

This interpretation applies to extensions of systems as well as new build systems. For example, where an extension is made to an existing system, we would expect a responsible person to undertake the safety verification.

There may be occasions where it is not clear if a transport operator does exist for a specific project. If this is the case, the organisation commissioning such an extension should contact ORR for advice.

### **Responsible Person**

An example of a 'responsible person' might be a Passenger Transport Executive (PTE) who had contracted a consortium to construct a new tramway.

There is no 'operator' as yet so, using the ROGS definition repeated above, the PTE is the 'responsible person' as they have 'contracted another person to make or build infrastructure'.

Once operation commences (when passengers start to travel on the system in question), the ROGS 'responsible person' ceases to exist (again looking at the definition, a 'responsible person' can only exist in the absence of an 'operator'). The 'operator' (and therefore the duty holder) would be either the PTE **or** any person(s) he had contracted with to carry out the operation.



## 2. Introduction

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### Background to ROGS

- 2.1 ROGS were introduced to put some of the requirements of the 2004 European Railway Safety Directive into practice on the mainline railway. ROGS do not apply the requirements of the Directive to tramways. However, ORR used ROGS as a regulatory framework for safety on guided transport systems, including tramways. This includes a safety verification process for some projects that introduce new or altered vehicles and infrastructure to existing tramway systems or that involve the introduction of new tramway systems.
- 2.2 ROGS came into force in 2006 and replaced several sets of railway safety regulations, including the Railways and Other Transport Systems (Approval of Works, Plant and Equipment) Regulations 1994 (ROTS). ROGS also replaced the Railways (Safety Case) Regulations 2000 and the Railways (Safety Critical Work) Regulations 1994, the implications of which are discussed in ORR's main 'Guide to ROGS' found on ORR's website at <http://www.rail-reg.gov.uk/upload/pdf/283.pdf>.
- 2.3 A significant change that ROGS brings about is that the safety regulator no longer has a role in approving new or altered infrastructure or vehicles, except where such approvals are required by specific enabling Acts and Orders.
- 2.4 Operators are responsible for making sure that new or altered vehicles or infrastructure are introduced safely. Safety verification provides a flexible process to help make sure those projects that could significantly increase risk are safe, so far as is reasonably practicable. This is achieved by appointing an 'independent competent person'. This person can come from inside or outside the organisation.

### What do ROGS require?

- 2.5 ROGS change some of the requirements for transport operators or responsible persons when introducing new or altered vehicles or

infrastructure. However, it is important to understand that many key principles are unchanged:

- Operators (or responsible persons) remain responsible for safely introducing new or altered vehicles or infrastructure;
- ORR, through advice and inspections, helps ensure that operators and responsible persons have adequate arrangements for safely introducing and operating new or altered vehicles or infrastructure; and
- Not every change made to a transport system requires safety verification.

2.6 The key new requirements of this aspect of ROGS for operators or responsible persons are:

- (a) deciding when safety verification is required;

and, if it is:

- (b) appointing a suitable independent competent person at an early stage;
- (c) preparing a written safety verification scheme, with the help of the independent competent person;
- (d) ensuring that the independent competent person undertakes the safety verification; and
- (e) making and keeping a record of the scheme, its findings and any action taken as a result.

Reg  
6(4)(a)  
Reg  
6(4)(b)

Is other legislation affected?

2.7 Transport operators and responsible persons must still comply with other relevant safety legislation, such as the Health & Safety at Work etc. Act 1974 and the Construction (Design and Management) Regulations 2007. There may also be approval requirements in the enabling Acts or Orders for specific systems. It is the transport operator or responsible person's duty to ensure these approvals are obtained.

2.8 The table below summarises the changes that ROGS introduces to the process of introducing new or altered vehicles and infrastructure safely.

<b>Task</b>	<b>Who is responsible?</b>	
	<b>Under ROTS</b>	<b>Under ROGS</b>
Deciding if introduction of new/altered vehicles or infrastructure requires approval or verification	The transport operator or promoter.	The transport operator or responsible person
Ensuring new/altered vehicles or infrastructure are placed into service safely	The transport operator or responsible person	The transport operator or responsible person
Ensuring safe operation of new/altered vehicles or infrastructure	The transport operator	The transport operator
Providing advice to help operator meet regulatory requirements and make decisions	ORR	ORR and independent competent person
Inspecting transport undertakings and responsible persons arrangements	ORR	ORR
Approval of new/altered vehicles or infrastructure	ORR	No approval required under ROGS. Enabling Acts and Orders may include approval requirements – these continue to have effect.
Ensuring safety verification of new/altered vehicles or infrastructure where there is a significant safety risk	No safety verification requirement	The transport operator or responsible person





## 3. Deciding if safety verification is needed

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### When is safety verification required?

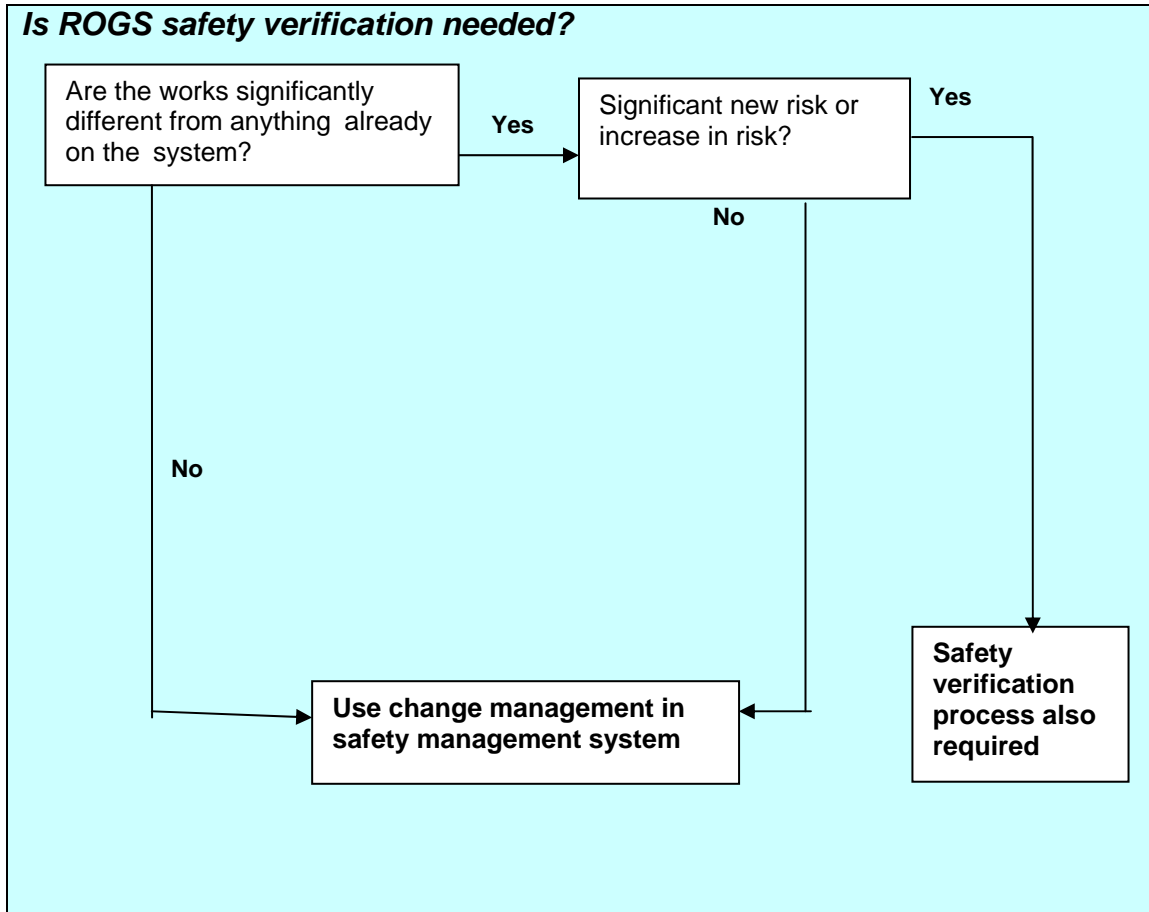
- 3.1 Safety verification (SV) will be required for entirely new transport systems, unless an exemption is granted. However, ORR cannot envisage a situation where there would be a reason to exempt a new system.
- 3.2 SV is not required for every change transport operators make to their transport system. In most cases, the change management arrangements that operators are required to have in their safety management system (described in the blue box below) should be capable of ensuring safety. We would also expect a safety management system to include reference to how decisions on applying SV would be reached. This should be part of the change management process.

#### ***Change management in a safety management system***

The aim of a change-management process is to control new risks properly. The process should:

- identify any new or increased risk resulting from a project;
- identify appropriate measures to control these risks and make sure they do not affect safety performance;
- make sure the level of assessment is suitable for the type of risk identified;
- make sure staff and managers have the skills and resources to carry out their safety responsibilities (a training plan could be useful for this);
- make sure changes are only made once any safety risks have been assessed;
- make sure staff and their representatives have been properly involved, briefed and consulted on the changes;
- make sure any relevant standards are met;
- make sure a written record of any concerns or issues raised and any decisions made to deal with them is kept;
- make sure the effects of the change are monitored once it has been put in place; and
- clearly define who is responsible for carrying out all of the above before, during and after the change.

3.3 The diagram below summarises the decisions operators or responsible persons will need to make.



3.4 SV is **only** required when a transport operator or responsible person wishes to place into service new or altered vehicles or infrastructure the design, construction, or testing of which:

Reg  
6(1)(c)  
(iii)

- incorporates significant changes compared to any vehicle or infrastructure already in use on the tramway system; **and**
- Is capable of significantly increasing an existing risk or creating a significant new safety risk.

**Do transport undertakings and infrastructure managers both have to undertake SV for every change to a system?**

Where a transport undertaking and an infrastructure manager both exist, the duty to carry out safety verification will fall on any person who is making a change that meets the tests above. This does not mean that both the transport undertaking and the infrastructure manager would have to carry out SV for each project. We could expect the transport undertaking and infrastructure manager to come to an agreement about how the change was to be managed and who was responsible for what.

If a person is unsure about where responsibility for carrying out SV rests, they should contact ORR.

3.5 A project that would have previously required ORR approval under ROTS will not necessarily require SV under ROGS. The test of whether a project requires a SV process has two stages:

- Difference test: is the vehicle or infrastructure different from anything already on the tramway system?

**and**

- Risk test: will there be a new significant safety risk or a significant increase in risk as a result?

3.6 These questions should be considered when transport operators or responsible persons do their initial risk assessment for a project. If this assessment shows that both tests are passed then SV applies. If the tests are not passed, existing change management arrangements are likely to be sufficient.

**Examples of projects requiring SV**

- Changing to a signalling system that is new to the system operator;
- Construction of a tunnel where the tramway does not already have any tunnels; and
- Placing into service a vehicle that was significantly different from others being used on that tramway. For example, running a new vehicle with a different form of electrical drive to those currently in use on the system.

**Examples of projects not requiring SV** (these projects would still require attention under your change management arrangements)

- Repositioning a signal to improve sighting;
- Like-for-like repairs to bridges and tunnels;
- Modification of under-seat heaters in tramcars;
- Running additional vehicles with the same characteristics as those currently in use on the system; and
- Introduction of on-tram ticket validations.

- 3.7 A transport operator or responsible person should compare their project with the test set out in ROGS as elaborated in this guidance. If SV is required, the next step is to appoint an independent competent person.

#### **Does a project meet the tests for SV?**

The decision on when to apply SV will depend on the facts surrounding each operation, and the same type of change in different systems may give different answers.

For example, if an existing tramway were extended to run alongside a mainline railway then safety verification would be required if the design of the infrastructure was different from the rest of the system. For example there may be significant design changes relating to electrical bonding, station access and boundary treatment to allow the extension to be brought into service.

The second part of the test relating to creating or significantly increasing a new risk is something that we would expect to come out through risk assessments at the initial stages of a project. In this case a significant new risk may be the capability of the tramway extension to interfere with mainline signalling systems.

There is not a one-size-fits-all solution for tramways in the UK. Contact ORR if you have any doubts about the application of the legislation.

- 3.8 If at any point during a project it becomes apparent that SV should apply to a project, the party with responsibility for the change takes the lead.

#### *Safety verification and change management*

- 3.9 The principles behind safely introducing new or altered vehicles or infrastructure are the same, whether operators use SV or the change management arrangements from their safety management system. The main difference is that the SV process uses an independent competent person to help operators ensure the risks are managed by carrying out an independent

verification. The requirements of change management arrangements are described in chapter 1 of 'A Guide to ROGS' found on ORR's website at:

[http://www.rail-reg.gov.uk/upload/pdf/342-ROGS\\_gdnce\\_nov07.pdf](http://www.rail-reg.gov.uk/upload/pdf/342-ROGS_gdnce_nov07.pdf)

### **Further advice**

- 3.10 ORR inspectors are happy to provide advice to help transport operators or responsible persons to decide whether a specific project requires SV.



## 4. The independent competent person

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### Who can be an independent competent person?

- 4.1 An independent competent person (ICP) can be an individual or an organisation who can meet the criteria for competence and independence (as described below in the section on 'Selecting an ICP'). More than one ICP may be required to cover the different aspects of some projects.

### What is the role of the ICP?

- 4.2 The ICP does not 'approve' vehicles or infrastructure for placing into service. Nor do they have a legal duty to "sign off" projects.

Reg  
6  
(1)(c)  
(iii)

- 4.3 The ICP's task is to help operators devise and carry out an effective safety verification, mainly by checking the operator's arrangements, based on information provided by the operator.

- 4.4 The operator of the transport system or responsible person, not the ICP, has the responsibility for ensuring new or altered vehicles or infrastructure are introduced and operated safely. The operator or responsible person must consider the views or recommendations of the ICP, but may challenge them and ultimately reject them if they wish. ORR expects operators to work with the ICPs to overcome any differences of view but ORR can provide advice if necessary.

### When should an ICP be appointed?

Sch  
4  
1(1)

- 4.5 The ICP must be involved in:
- the design selection process (i.e. checking the transport operator or responsible person has selected an appropriate design);
  - identifying or setting standards and conditions for the verification process; and
  - setting out the inspection and assessment plan.
- 4.6 The foundation of a SV scheme is the timely appointment of an ICP. For example, a transport operator or responsible person must draw up the

project specific verification scheme taking into consideration the advice of the competent person. The competent person should be involved in setting the verification criteria and checking that appropriate standards have been written or selected for inclusion in the scheme.

- 4.7 The ICP's role is not to choose a design, or standard, but to help transport operators or responsible persons make the best choices, through challenge and review of design specifications, standards and inspection and assessment plans.

### Selecting an ICP

- 4.8 For the purposes of ROGS there are three important things to consider when appointing an ICP.

Reg  
2

#### *Competence*

- (a) The ICP should have the skills and knowledge needed to carry out the SV.

The transport operator or responsible person may wish to gather and keep evidence of this. This evidence could include:

- experience in the industry or the type of work;
- direct knowledge of the specific process they are overseeing, such as making sure vehicles or signal systems are acceptable;
- experience of the safety regulatory process, in terms of setting standards and gathering evidence appropriately;
- written qualifications that can be checked;
- being aware of current best practice; and
- being aware of the limits of their skills and experience.



### *Impartiality*

- (b) The ICP should not have been responsible for any of the things they will have to assess because that might cause them to be biased in their assessment.

For third-party competent persons:

- they should not profit (other than any remuneration, or other benefit for acting as the independent competent person) from the project being introduced, such as if they run or own shares in a company that makes parts being used in the project; and
- they should not verify the suitability of a product or component that they designed or built.

### *Independence*

- (c) The ICP shall not be part of the management team that is responsible for the project.

An in-house competent person:

- should report direct to senior management and not be responsible for designing the project; and
- must have the authority to ask for information, carry out examinations and make recommendations.

The decisions which transport operators or responsible persons need to make when choosing an ICP are summarised in **Annex 1**.

### **Who can be an ICP?**

4.9 Anyone who can meet the three criteria for competence impartiality and independence is able to act as the ICP. Under ROGS, an ICP can be an individual, a group of individuals or an organisation.

4.10 Where a group of individuals are fulfilling the ICP role, the transport operator, or responsible person should make arrangements to ensure that tasks such as record keeping are carried out consistently. Decisions on verification standards are for the transport operator or responsible person to take. If ICPs have differing views, the transport operator or responsible person will need to make an informed decision on how to proceed.

The main sources of ICPs in the tramway sector are likely to be:

- In-house experts (see box below);
- Other transport operators;
- Consultants; and
- Individuals acting independently.

#### ***In-house ICPs***

A competent person does not have to be employed by another organisation (a 'third party') to be independent. It is perfectly acceptable for SV to be done 'in-house'. The most important thing is to show that the ICP is independent enough from the project to give an objective (unbiased) assessment.

It is important that the ICP has appropriate levels of impartiality and independence from pressures, especially of a financial or operational nature, which could affect sound judgment.

They should not verify their own work, and their management lines should be separate from those persons whose work they are checking. For instance, it is acceptable in principle for an operator's in-house team or chief engineer to check work done elsewhere in the same organisation. However, it would influence objectivity if that team or individual was directly managed by the manager responsible for meeting targets that might be adversely affected by the findings of the verification process.

## **Should ICP be insured?**

4.11 ROGS does not give the ICP any statutory duties in addition to those under the Health & Safety at Work etc. Act 1974. It would be prudent for anyone providing technical advice (including as an ICP under ROGS) on which others rely to discharge their legal responsibilities to insure themselves against possible actions for negligence.

Specialist insurers have advised ORR that, for the main types of competent persons in the tramway sector:

- tramways are already responsible for safely managing the introduction of vehicles and infrastructure. In-house verification of this work would not count as an additional activity that would require further insurance;

- large consultancy organisations will already hold their own professional indemnity insurance; and

- individuals wishing to operate independently as freelance ICPs are advised to secure cover, which may be available through a professional body.

## 5. The safety verification process

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- 5.1 Safety verification (SV) is essentially an independent check of an operator's arrangements for safely managing a project to introduce new or altered rolling stock or infrastructure.
- 5.2 The ICP undertakes the SV by advising, assessing and monitoring the proposed scheme from design, build and test through to documentation. They are responsible for examining (either on paper or by physical inspection) the information provided to them by the operator and reporting back on the adequacy of their arrangements.
- 5.3 However, the operator is responsible for developing and managing the SV scheme and for responding to the ICP's recommendations. The ICP cannot impose requirements or stipulate the use of certain equipment. The final decisions on a project rest with the operator.

### What does the SV scheme need to include?

- 5.4 A written SV scheme allows the ICP to assess and monitor:
- the methods the project uses and the project design;
  - whether tests are being carried out safely, and in line with agreed standards and conditions; and
  - whether the project is being installed and brought into service safely.
- 5.5 The written scheme must at least include arrangements for all the following information:

#### *Appointment of the ICP at an early stage*

Sch 4  
1(1)(a)

- 5.6 The transport operator or responsible person will need to ensure that they apply an appropriate process for identifying and selecting an ICP.

The decision about whether to use SV should be based around 'risk' and 'difference' testing as described earlier in this guide, in the section on 'Deciding if safety verification is needed'.

The selection criteria for an ICP should be based around the criteria

described in the earlier section on 'The independent competent person'.

The transport operator or responsible person should make provision for the ICP to be retained for the duration of the verification process. Where this is not possible and a new ICP is required, that person should review the records of previous discussions, and agree with the transport operator or responsible person how the verification should proceed.

If in doubt, ORR inspectors are happy to provide advice on a case-by-case basis though we will not select or provide an ICP.

Sch 4  
1(1)(b)

*Involvement of the ICP in establishing safety verification and design selection criteria and standards*

- 5.7 The actual standards and criteria against which the safety of the project in question is being verified should be discussed with the ICP and his comments should be recorded to give transparency to the process and provide an audit trail.
- 5.8 The transport operator or responsible person needs to show that they have used appropriate safety standards, criteria and good practice, which may include the need to meet requirements of other regulations. The transport operator should consult the independent competent person in developing safety standards and processes to meet them.

***How can transport operators develop standards?***

Our view is that transport operators should put suitable controls into their own individual safety management systems as company standards or requirements.

For the purposes of SV, it may be necessary to develop bespoke standards where no other suitable standard exists.

ORR inspectors are working with representatives of the tramway industry to draw up a suite of enhanced guidance for tramway operators. It may be appropriate to use standards from other EU Member States if they are relevant.

Sch 4  
1(1)  
(c)*Arrangements for communicating information to the ICP*

- 5.9 The transport operator or responsible person needs to show that they have provided the ICP with all the relevant information and documents they need to be able to carry out a satisfactory assessment.

This would usually include:

- documents used in designing and setting out a specification for the project;
- certificates of conformity for materials used;
- any other risk assessment and safety analysis reports;
- evidence that the project meets the relevant standards, and an explanation of how risk will be managed where the project does not meet the standards or there is no relevant standard; and
- evidence of working with other relevant parties to make sure related projects work together. This could include Highway or Roads Authorities for example.

Sch 4  
1(2)*Arrangements for controlling risks arising during testing*

- 5.10 The transport operator or responsible person should develop suitable testing proposals to ensure that the tests can demonstrate that the system functions as designed and that risks are reduced as low as is reasonably practicable. The transport operator or responsible person should involve the competent person in the planning of the tests. The advice of ICP should help to ensure that all aspects of the system with safety implications are assessed. They should also be able to offer advice on the relevant tests to be made and the appropriate records to be kept.
- 5.11 In many cases the testing process itself has the potential to introduce risk onto the transport system. It is important that the verification scheme takes account of such risks and ensures that controls are in place to mitigate them, and the standards and criteria to be applied in the verification process.

Transport operators or responsible persons do not require consent from ORR to begin testing. Before testing commences, operators or responsible persons should involve the independent competent person in establishing:

- the scope of the test;
- the success criteria; and

- the operating arrangements for the test.

The consent of the Highway Authority may be required before testing of vehicles on the highway can start.

Sch 4  
1(3)

*Arrangements for review and revision of the scheme by the ICP*

- 5.12 The transport operator or responsible person is responsible for preparing the written SV scheme, but the ICP should be involved in checking and refining it as the project progresses.

Sch 4  
1(4)

*Arrangements for keeping records*

- 5.13 The transport operator or responsible person must make sure that the method of assessment and its findings – including any action the ICP has recommended the transport operator or responsible person take – are recorded and communicated to the appropriate managers.

- 5.14 The transport operator or responsible person must also keep a record of any action they take as a result of the assessment. The transport operator or responsible person does not have to act on the recommendations made by the ICP. Where the transport operator or responsible person does not do so, they should document the reasons.

- 5.15 If the transport operator or responsible person cannot ensure that safety risks are being managed so far as is reasonably practicable (irrespective of whether or not the ICP's recommendations are implemented), then they should not proceed with placing the project into service. ORR inspectors are happy to provide advice to transport operators or responsible persons where there is uncertainty about how best to proceed.

Sch 4  
1(5)

*Arrangements for sharing the scheme with appropriate managers*

- 5.16 To ensure effective governance of the SV process, the scheme and important information and decisions arising from it should be communicated to appropriate managers. The appropriate level of communication is for the operator to decide. However, it is likely to involve those with sufficient authority to ensure that any action required in relation to the SV is taken.

## The ICP's assessment

- 5.17 As the table below shows, an ICP's assessment is not a one-off examination or check which takes place at the end of the project. Rather, the ICP should be involved throughout the project – assessing the adequacy of arrangements for ensuring safety from the design stage onwards and recommending any necessary action.
- 5.18 The ICP is also there to check that the transport operator or responsible person has carried out the examination and testing described in the SV scheme (but not to undertake the actual examination or testing).
- 5.19 The verification assessment should be proportionate to the size, complexity or risk involved in a project, but would usually involve physically inspecting, or reviewing documents relating to, things such as:
- project specifications;
  - designs;
  - certificates;
  - arrangements for managing highways interfaces; and
  - compliance of products with relevant safety law (such as CE marking).
- 5.20 The ICP is not responsible for checking every safety critical part, but they should check that the transport operator or responsible person has taken steps to ensure that:
- the design of the project meets relevant safety standards;
  - any safety-critical parts are suitably designed and built; and
  - the project has been built, installed and tested safely.
- 5.21 The table below sets out the assessment arrangements in a typical safety verification (SV) process:

Stage	Transport operator (or responsible person)	Independent competent person (ICP)	ORR
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<p>Initial concept</p>	<p>Decides SV applies</p> <p>Appoints ICP</p> <p>Develops project scope</p> <p>Sets out ongoing communication arrangements throughout course of scheme</p>	<p>Receives information on project scope, interfaces, and how risks will be identified and controlled.</p> <p>Advises on compliance with best practice, suitability of proposed standards and gaps where additional standards could be required.</p>	<p>May audit and inspect safety verification schemes or safety management system arrangements at any point in the safety verification process or during the life cycle of the project</p>
<p>Check of design and integrity</p>	<p>Provides information on project design selection process, proposed standards and verification criteria</p> <p>Drafts written SV scheme</p>	<p>Checks and reports back on suitability and robustness of SV scheme. May recommend improvements.</p> <p>Develops and agrees verification plan with operator or responsible person.</p>	
<p>Manufacture, design and installation</p>	<p>Provides information on manufacture and design of component(s) and assemblies</p> <p>Sets out strategy for installation and ensuring compatibility</p>	<p>Checks and reports back on design, manufacture and compatibility arrangements. May recommend alternatives or improvements.</p>	



Testing	Provides information on plans for testing, on the results of the testing and on recommendations for and performance of any resulting remedial action	Checks and reports back on testing arrangements and results. May recommend improvements to testing arrangements.	May audit and inspect safety verification schemes or safety management system arrangements at any point in the safety verification process or during the life cycle of the project
Bringing into service	Provides information on arrangements for integration of components, safe bringing into service and managing interfaces.  Provides final report of SV scheme to appropriate management.	Checks and reports back on arrangements. May recommend improvements.  Involvement ends.	
Operation (post-project completion)	Operates under safety management system.  Retains records of information provided to ICP, and ICP's reports/recommendations.	May wish to retain records of reports and recommendations for their portfolio.	

Reg 6(4) (b)

5.22 ROGS requires transport operators and responsible persons to ensure that the ICP carries out the SV. One way of doing this is for transport operators or responsible persons to include the tasks the ICP(s) needs to carry out in any contractual arrangements with the person they appoint.

**What records should a transport operator or responsible person keep?**

*Project-specific*

5.23 Record keeping is not a bureaucratic task to be undertaken at the end of the project. The process of providing information, carrying out checks and agreeing action between the transport operator or responsible person and

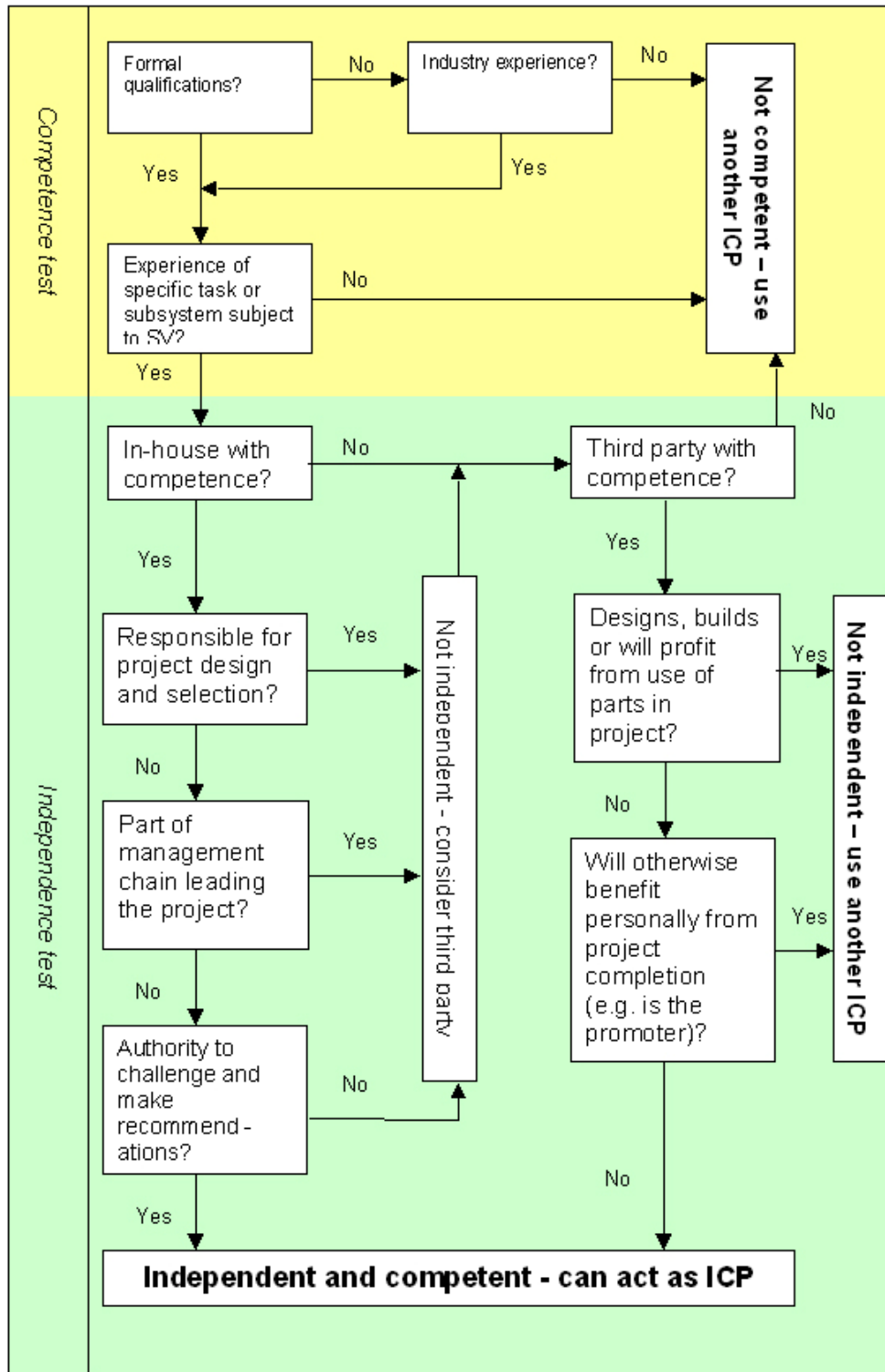
the ICP will enable the operator or responsible person to build up a file about the project. This could include records of:

- the specific written scheme for the project;
- all the information the transport operator or responsible person provides to the ICP, including the results of individual tests;
- the ICP's assessments, and any recommendations; and
- the action the transport operator or responsible person takes.

5.24 If some of these records are generated by other processes (e.g. the health and safety file for a project carried out under the Construction (Design & Management) Regulations) then there is no need to duplicate the information. However, the information should be cross-referenced in the written SV scheme.

5.25 The transport operator or responsible person may wish to retain these records for the lifetime of the vehicles or infrastructure introduced by the project. If a transport operator or responsible person ceases to hold these responsibilities, they should transfer their records to the new transport operator or responsible person who should retain them as suggested above.

# Annex 1: Decision chart for selecting an independent competent person





## ***Annex 2: Case studies***

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### **Case study 1a (Vehicles):**

**A tramway transport undertaking intends to purchase six additional vehicles, of a different type to those already in operation on the system, which it will wish to place into service.**

*Is safety verification (SV) required?*

1. The undertaking knows that they will not be able to buy identical versions of their existing vehicles and so inevitably the new vehicles will have different technical and operational characteristics to those already in use on the transport system. There are two tests for applying safety verification:

- (a) Will the new vehicles be different from anything else on the particular tramway system?

In this case yes; the vehicles will almost certainly have different performance characteristics and be technically different from those the tramway already has. (For this example we will consider that the new vehicles come from a different manufacturer).

Issues could arise: if vehicles of different types were to be in a collision; it might be impossible for a vehicle of one type to rescue a failed vehicle of the other type; the new vehicles might impart different physical forces onto the infrastructure; and the new vehicles might have different electromagnetic emissions that could affect tramway or neighbouring systems.

Given just these differences we can consider the first test is met.

- (b) Could the new vehicles significantly increase an existing risk or create a significant new safety risk?

We can look at two aspects here – electromagnetic interference and collisions performance.

A new vehicle might have a different form of electrical drive from that of an older generation of vehicles. That drive system could easily be producing electromagnetic interference in frequencies that the older vehicles did not. As a result the existing electronic systems of the tramway or an adjacent railway might be susceptible to interference. In the worst case this could lead to wrong-side failures in signalling equipment and onward to derailments. This certainly represents a serious and significant safety risk.

If the new vehicles were to have a different floor construction this may in turn mean they have different heights of major structural elements. In a collision between an old and new tramcar it is possible that the new car might be considerable weaker and susceptible to being over-ridden by the older car. For any tram driver in a new car this could mean that they would have very little protection if they were to collide with the rear of an older car. This could present a serious risk to the safety of the tram driver, and potentially to their passengers as well.

From these risks we can consider the second test to be met.

2. So, given that the vehicles are different and capable of presenting significant safety risks it is almost certain that safety verification will be required for their introduction.
3. Since the undertaking will know at an early stage that new vehicles are likely to require safety verification they can move quickly to involve a competent person at an early stage of their specification process.

*Selecting the ICP:*

4. The transport undertaking has only a small number of engineering staff, all of whom will have been involved in the process of selecting the new vehicle supplier. As such there is no one already employed who will be sufficiently independent of the choice of vehicle to be able to act as ICP. The transport undertaking therefore decides to hire the services of a well-known firm of international engineering consultants who claim to have considerable experience in the design and/or operation of tramways.
5. The transport undertaking will need to ensure that the specific staff that the consultancy firm are proposing to use, have appropriate experience of tramway vehicles, electromagnetic compatibility and of signalling systems

relevant to the system under development. It is important to stress that it is not the overall experience of the consultancy firm that is important but specifically the experience of the staff that will be deployed to the task.

6. The transport undertaking should expect that the staff proposed are members of appropriate professional engineering institutions and preferably chartered engineers. In some circumstances extensive practical experience may be sufficient. The key point is for the transport undertaking to satisfy itself of the person's competence.

Writing the scheme:

7. There is a lack of formal UK standards in tramways in many areas so it would be expected that the particular tramway operator would already have a specification for its existing tramcars. They would then need to discuss with the ICP what standards, including those from elsewhere in Europe, might be relevant to the work. This would probably also involve commenting on deviations from those standards justified to the particular conditions and features of the tramway.
8. Some of the competent persons work will be at the initial specification stage, supporting the undertaking as they prepare their tender documents. As the tendering process progresses it is likely that the competent person will be working with the undertaking in responding to queries from tenderers.
9. In the area of electromagnetic compatibility there are already well established BS EN standards that could be applied and the ICP should be looking to ensure that these are used, and if not that equivalent standards achieving the same levels of safety are applied.
10. Physical interface issues could be demonstrated through practical tests and computer modelling could be used for situations such as collisions. Electromagnetic compatibility issues should be developed first through component level studies and then through emission and immunity tests on the relevant systems during periods of engineering possessions.
11. The assessment scheme should be able to show that the effect of the new vehicles on the tramway system and other adjacent railways does not create any hazards for which risks have not been reduced to as low as is reasonably practicable and which are tolerable.

*The assessment:*

12. For the physical aspects of the vehicles the ICP should expect that records have first been obtained to establish the nature of the existing tramway infrastructure and vehicles. There should be evidence that checks have been made in areas such as clearances, wheel/rail interface and loading standards for example. There should be a stream of work to consider how the types of vehicles would interface physically in routine circumstances (rescue for example) and in emergencies (in a collision). From this work there should be evidence of remedial works/mitigations to ensure that overall system performance and safety is maintained.
13. The ICP might note for example that the wheel profile of the trams being supplied is a standard European profile and not consistent with the current system. Without a wheel/rail interface study there could be potential risks of derailment. The ICP should be able to raise areas of unresolved risk such as this with the transport undertaking as a hazard. The ICP should then check that this hazard is closed out in an appropriate way; for example this might be by doing the study work to prove the safety of the new wheel with the system, or it might be by confirming the re-profiling of the new wheel to the existing tramway profile.
14. For electromagnetic compatibility hazards the ICP should expect the tramway and the vehicle supplier to be looking at the emissions of the new vehicle in normal and degraded modes and considering how this might affect the existing tramway systems. They should also be involved closely with the technical staff of neighbouring systems to ensure that electromagnetic interference hazards are not exported to those systems, and if they are what mitigating measures need to be put in place. The ICP should expect to see some form of acceptance or agreement from affected third parties once they are satisfied that risks to their system have been identified and managed.

*Recording the findings:*

15. The tramway undertaking should be maintaining a hazard or issues log to demonstrate that all the potential safety risks identified through the scheme have been closed out in a suitable manner.



16. The ICP should also be able to examine records that will be kept of studies, tests and simulations to confirm that the design of the vehicles and any system modifications, have reduced risks.

## Case study 1b (Vehicles):

**A passenger transport executive (PTE) intends to purchase six additional vehicles to be operated on a system for which they already have a transport undertaking. The vehicles will be of a different type to those already in operation on the system.**

*Who is responsible for safety verification (SV)*

17. The PTE will be tendering and paying for the new vehicles. The transport undertaking will be operating the new vehicles.
18. Regulation 6(6) of ROGS (Responsible Persons) does not apply in this case because there is already a transport operator (the existing undertaking) who will be operating the vehicles. The transport undertaking will be covered through ROGS regulations 6(1)(c)(iii) and 6(4). The responsibility to carry out safety verification, if required, rests with the transport undertaking who will be placing the vehicles into service. It does not rest with the person who is paying for the vehicles.
19. It is important to distinguish between commercial contractual relationships and responsibilities and those that ROGS and other legislation such as the New Roads and Street Works Act 1991 or the various Highways Acts create.

*Is SV required?*

20. The undertaking knows that the new vehicles will not be identical versions of their existing vehicles and so inevitably the new vehicles will have different technical and operational characteristics to those already in use on the transport system. There are two tests for applying SV:
  - (a) Will the new vehicles be different from anything else on the particular tramway system?

In this case yes; the vehicles will almost certainly have different performance characteristics and be technically different from those the tramway already has. (For this example we will consider that the new vehicles come from a different manufacturer).

Issues could arise: if vehicles of different types were to be in a collision, it might be impossible for a vehicle of one type to rescue a failed vehicle of the other type; the new vehicles might impart different

physical forces onto the infrastructure; and the new vehicles might have different electromagnetic emissions that could affect tramway or neighbouring systems.

Given just these differences we can consider the first test is met.

- (b) Could the new vehicles significantly increase an existing risk or create a significant new safety risk?

We can look at two aspects here – electromagnetic interference and collision performance.

A new vehicle might have a different form of electrical drive from that of older generation of vehicles. That drive system could easily be producing electromagnetic interference in frequencies that the older vehicles did not. As a result the existing electronic systems of the tramway or an adjacent railway might be susceptible to interference. In the worst case this could lead to wrong-side failures in signalling equipment and onward to derailments. This certainly represents a serious and significant safety risk.

If the new vehicles were to have a different floor construction this may in turn mean they have different heights of major structural elements. In a collision between an old and new tramcar it is possible that the new car might be considerable weaker and susceptible to being over-ridden by the older car. For any tram driver in a new car this could mean that they would have very little protection if they were to collide with the rear of an older car. This could present a serious risk to the safety of the tram driver, and potentially to their passengers as well.

From these risks we can consider the second test to be met.

21. So, given that the vehicles are different and capable of presenting significant safety risks it is almost certain that SV will be required for their introduction.
22. Since the undertaking will know at an early stage that new vehicles are likely to require safety verification they can move quickly to involve a competent person at an early stage of the PTE specification process.
23. The PTE and the transport undertaking will need to cooperate closely on the preparation of the tender specification and the advice of the competent person

will support this process. We would expect the PTE to involve the transport undertaking and their competent person at an early stage in the specification meetings and discussions on verification. If the PTE fail to involve the transport undertaking, the transport undertaking will have to appoint a competent person as soon as they become aware of the project. This may delay projects as the transport undertaking still has to fulfil its obligations under the regulations.

24. It is important to stress that even though the PTE is specifying and tendering the new vehicles it is the transport undertaking that will be placing the vehicles into service and therefore the transport undertaking who must appoint the competent person. There is no role for a responsible person in this example, as the transport undertaking already exists. The PTE must cooperate with the transport undertaking and their competent person to ensure the transport undertaking can discharge their duties.

*Selecting the competent person:*

25. The transport undertaking has only a small number of engineering staff, all of whom will have been involved in the process of selecting the new vehicle supplier. As such there is no one already employed who will be sufficiently independent of the choice of vehicle to be able to act as ICP. The transport undertaking therefore decides to hire the services of a well-known firm of international engineering consultants who claim to have considerable experience in the design and / or operation of tramways.
26. The transport undertaking will need to ensure that the specific staff that the consultancy firm are proposing to use, have appropriate experience of tramway vehicles, electromagnetic compatibility and of signalling systems relevant to the system under development. It is important to stress that it is not the overall experience of the consultancy firm that is important but specifically the experience of the staff that will be deployed to the task.
27. The transport undertaking should expect that the staff proposed are members of appropriate professional engineering institutions and preferably chartered engineers. In some circumstances extensive practical experience may be sufficient. The key point is for the transport undertaking to satisfy itself of the competent person's competence. If staff hold qualifications from elsewhere in Europe then these should be of equivalent standing to those of the UK. The

consultancy firm should be able to supply a copy of each person's CV and their job history as a matter of course.

28. As normal practice in any contract the consultancy firm should have a lead person to act as the coordinator of the firms ICP function.

*Writing the scheme:*

29. There is a lack of formal UK standards in tramways in many areas so it would be expected that the particular tramway would already have a specification for its existing tramcars. The PTE would then need to discuss with the transport undertaking and the ICP what standards, including those from elsewhere in Europe, might be relevant to the work. This would probably also involve commenting on deviations from those standards justified to the particular conditions and features of the tramway.
30. Some of the competent person's work will be at the initial specification stage, supporting the transport undertakings input to the PTE as they prepare their tender documents. As the tendering process progresses, it is possible that the competent person could work with the transport undertaking and the PTE in responding to queries from tenderers.
31. In the area of electromagnetic compatibility there are already well established BS EN standards that could be applied and the ICP should be looking to ensure that these are used, and if not that equivalent standards achieving the same levels of safety are applied.
32. Physical interface issues could be demonstrated through practical tests and computer modelling could be used for situations such as collisions. Electromagnetic compatibility issues should be developed first through component level studies and then through emission and immunity tests on the relevant systems during periods of engineering possessions.
33. The assessment scheme should be able to show that the effect of the new vehicles on the tramway system and other adjacent railways does not create any hazards for which risks have not been reduced to as low as is reasonably practicable and which are tolerable.

*The assessment:*

34. For the physical aspects of the vehicles the ICP should expect that records have first been obtained to establish the nature of the existing tramway infrastructure and vehicles. There should be evidence that checks have been made in areas such as clearances, wheel/rail interface and loading standards for example. There should be a stream of work to consider how the types of vehicles would interface physically in routine circumstances (rescue for example) and in emergencies (in a collision). From this work there should be evidence of remedial works/mitigations to ensure that overall system performance and safety is maintained.
35. The ICP might note for example that the wheel profile of the trams being supplied is a standard European profile and not consistent with the current system. Without a wheel/rail interface study there could be potential risks of derailment. The ICP should be able to raise areas of unresolved risk such as this with the transport undertaking as a hazard. The ICP should then check that this hazard is closed out in an appropriate way; for example this might be by doing the study work to prove the safety of the new wheel with the system, or it might be by confirming the re-profiling of the new wheel to the existing tramway profile.
36. For electromagnetic compatibility hazards the ICP should expect the tramway and the vehicle supplier to be looking at the emissions of the new vehicle in normal and degraded modes and considering how this might affect the existing tramway systems. They should also be involved closely with the technical staff of neighbouring systems to ensure that electromagnetic interference hazards are not exported to those systems, and if they are what mitigating measures need to be put in place. The ICP should expect to see some form of acceptance or agreement from affected third parties once they are satisfied that risks to their system have been identified and managed.

*Recording the findings:*

37. The transport undertaking should be maintaining a hazard or issues log to demonstrate that all the potential safety risks identified through the scheme have been closed out in a suitable manner.

38. The ICP should also be able to examine records that will be kept of studies, tests and simulations to confirm that the design of the vehicles and any system modifications have reduced risks.

## Case study 2a (Infrastructure):

**A tramway operator with an existing single 15 km route builds a 2 km spur to a new park and ride site. The existing system is largely segregated from cars and pedestrians except for a 1 km section running through a park where it is open to pedestrians. The new extension will be entirely segregated from cars and pedestrians.**

*Is safety verification (SV) required?*

39. The new spur will be very similar to the majority of the existing route, operating on abandoned railway formation in a cutting, with terminus arrangements identical to those at the existing tramway termini.

(a) Are there aspects of the extended route that are different from anything on the particular tramway system?

No, there are no substantially different features on the extended route.

The first test has not been met

40. Given that the test for requiring SV requires there to be different features then we can see at this point that SV would not be required in this case.

41. There would be no requirement to appoint a competent person.

42. The development of the extension would progress under the normal change management provisions of the transport operator.

**NOTE:**

43. This case study is specific to an existing transport operator. There may be cases where SV is required for an extension (see case study 2b). If you have any doubts over any proposed works and the applicability of the regulations please contact ORR.



## Case study 2b (Infrastructure):

**A passenger transport executive (PTE) has an existing single 15 km route with a tramway operator in place. The PTE wishes to build a 2 km spur to a new shopping centre. The existing system is largely segregated from cars and pedestrians except for a 1 km section running through a park where it is open to pedestrians. The new extension will be operated on highway with shared running with highway vehicles.**

*Is safety verification (SV) required?*

44. The new spur will be quite different from any of the other types of operation of the tramway. There are two tests for applying SV:

- (a) Are there aspects of the extended route that are different from anything on the particular tramway system?

The current tramway operates mainly on ex-railway formation or through open parkland. Although there is an interface with pedestrians there is no interface with highway vehicles. The new extension will provide a significantly different operating environment in this respect.

The first test has been met.

- (b) Do these different aspects have the capability of significantly increasing an existing safety risk or creating a significant new safety risk?

45. We can consider two example areas where there could be issues of significant risk.

46. Firstly, when operating on the highway the trams will now require the installation of overhead electrification at 750 v DC. Failures in this system or vandalism could expose the public to dangerous and even fatal electrical conditions.

47. Secondly, the tramcars have never needed to interact physically with motor vehicles; consideration will need to be made of vulnerability of other vehicles during collisions, their braking rates and many other factors.

48. A collision to the side of a tramcar by a lorry for instance could easily result in deaths amongst tram passengers.
49. From these examples it is clear that the extension will create some significant new risks to the tramway and to other users of the highway.
50. Given that the extension will be different from anything else on the tramway and that significant risks could be created then SV would be required.

*Who appoints the competent person?*

51. Where new infrastructure is being created that is wholly separate from the existing system then until it is brought into service for the provision of a passenger transport service then through the definitions of ROGS it is not a 'transport system' nor is it part of the existing tramway until that time.
52. On this basis we can state that though there is a transport operator in place on the existing system, and even though they will operate the new section in passenger service, until the extension is brought into use there is no transport operator in place for it. On this basis the responsibilities in ROGS therefore devolve to the responsible person.
53. The PTE has appointed a consortium to design and build the new extension, though it will be operated and maintained by the existing operator. From the definitions in ROGS it is clear that since the PTE has contracted for the construction of the works then they are the responsible person. Hence it is the PTE who must have safety management system suitable for the control of risks on the project and who must also appoint the competent person.

*Selecting the competent person*

54. Though the PTE has a small number of engineers it decides that for a competent person it needs a broader range of skills given that the new extension is of a different character from the existing system with which they are familiar and hence may require different technical solutions that their existing staff may not be sufficiently competent to consider.
55. The PTE decides to hire two separate competent persons to advise them; one an ex-railway inspector who has recent experience of tramway/highway issues, and a separate engineer to give more specific support in relation to electrification issues in highway areas.

56. The ex-railway inspector is not professionally qualified but has a proven track record of inspecting and advising on tramway safety in highway situations and tramway guidance documentation. The electrification engineer is a chartered electrical engineer who has specific experience of the design of overhead supply systems for tramways (as opposed to railways).
57. The PTE negotiates contracts of engagement with the two competent persons that require them to cooperate in the provision of advice and other competent person functions. The PTE has also ensured that there are suitable clauses in the contract with the design and build consortium to require them to cooperate with the competent persons.

*Writing the scheme.*

58. The competent persons both help the PTE to draw up the detail of the proposed verification scheme. The PTE already has a series of standards that it has specified for the works and has access to the standards that the undertaking uses for the maintenance of its track and electrification systems. The competent persons will support the PTE in assessing whether standards are suitable for the new extension and identifying additional standards that will need to be developed for the features of the extension not covered by the existing standards.
59. The verification scheme will need to be kept under review and may need to be modified as the scheme progresses.

*Carrying out the assessment*

60. The competent persons are hired at a suitably early stage to allow them to support the PTE's outline design for the new extension and the selection of related standards.
61. The PTE tenders for a contractor on a design and build basis. During the tender period the competent persons could provide support to the PTE in formulating questions for the tenderers where these are related to safety and also in responding to similar questions from the tenderers.
62. Once the contractor has been selected the competent persons support the PTE in their review of the detailed design work done by the contractor and carry out checks on site to confirm construction standards when appropriate.

They also work with the parties to see that a relevant series of tests and trials are conducted to demonstrate the safety of the new extension.

63. Where parts of the process are subject to existing well documented and standardised third-party assessment systems, such as for a new bridge to cross a river on the route, then if the work would normally require safety verification the competent person could expect to check that the third-party assessment was done by an appropriate person but it would not be necessary for them to review that work any further.

*Recording the findings.*

64. The competent persons should expect the design and build contractor to be keeping a hazard/issues log as the project progresses from design through construction, testing and commissioning and into trial operation. This should show that the various hazards are closed out in suitable and sufficient ways as the job progresses such that as each new stage of work is reached all hazards have been identified and controlled to a degree suitable for that stage of the work.
65. Where either of the competent persons has concerns at any stage then they must record these and pass their concerns to the PTE.