



*Engineering Safety Management*

*Yellow Book 4*

***Application Note 8***  
***Safety Management and***  
***Standards***

*Issue 1.1*

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# 1 INTRODUCTION

## 1.1 Background and purpose

The Yellow Book Steering Group has developed a series of application notes to supplement the Yellow Book [1]. Each application note provides more detailed guidance on a particular aspect of the Yellow Book.

This application note provides guidance on:

- the circumstances in which risk can be satisfactorily controlled through standards<sup>1</sup> rather than by using specific measures designed for the particular circumstances and derived from an assessment of the risk; and
- how the guidance in the Yellow Book should be adjusted for these circumstances.

The need for this guidance has been clear for a while. The introduction to issue 4 of the Yellow Book says:

*“In the next issue of the Yellow Book we intend to provide guidance on how to put all fundamentals into practice in applications where risk is controlled through standards and procedures, including those that fall under the interoperability directives and ROGS Regulations [Railways and Other Guided Transport Systems (Safety) Regulations 2006].”*

This application note is intended to start discharging our promise “to provide guidance on how to put all fundamentals into practice in applications where risk is controlled through standards and procedures”.

All railway professionals who design, build or maintain parts of the railway will work to standards, and many of these will contain requirements that control risk. Anyone in this position, who is required to use their judgement to discharge their duties, will find the guidance useful. However it will be most useful to those working within railway disciplines which are well furnished with standards, such as some aspects of civil engineering, mechanical engineering and signal engineering.

This note is also written for those people working within headquarters functions, who have a responsibility to review the application of standards.

This note is not written for those involved in drafting standards, although much of the main body of the Yellow Book will be relevant to anyone in that position.

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<sup>1</sup> Later on we will use ‘standard’ more precisely – for now we are using it to cover mandatory standards and procedures and advisory guidelines.

## 1.2 Summary of guidance

We consider that there is no conflict between using standards to control risk and the Yellow Book fundamentals, but we do consider that it will affect the way you put the following fundamentals into practice:

- **Identifying hazards,**
- **Assessing risk,**
- **Reducing risk,**
- **Safety requirements,**
- **Evidence of safety,**
- **Monitoring risk,** and
- **Independent professional review.**

We consider that the application of the other fundamentals is not significantly affected.

Railway safety relies on the skill, experience and diligence of railway professionals. The uncritical application of standards is insufficient on its own to ensure safety because people who write standards cannot foresee everything. There must always be room for experience, judgement and common sense.

On the other hand, it is unnecessary to try to confirm by formal risk assessment that every application of every standard reduces risk to a level which is As Low As Reasonably Practicable (ALARP).

This seems like a stalemate. We have to apply judgement to the application of standards and this judgement must surely be based on some assessment of the risk, but we cannot carry out risk assessment for each application. However, this apparent stalemate is resolvable in two ways.

Firstly, by recognising that, while 'formal' risk assessment is a relatively new invention in the long history of engineering, engineers have generally performed informal risk assessment, in the sense of considering things that could go wrong, as an integral part of their work. Therefore, we describe a simple, common-sense approach that rests on a brief initial assessment of the standards and only proceeds to formal assessment if the standards are unsuitable or not clearly sufficient to control risk.

Secondly, by recognising that where those who are applying standards do not have all the skills and knowledge to judge whether they are appropriate or not, they can in general rely on their organisation's central engineering and/or risk management functions to keep standards and risk under review. We describe some tasks that we would expect such review processes to include.

### **1.3 Commenting on this guidance**

We are continually working to improve the Yellow Book and we welcome comments. Please contact us at the address below, if you have a suggestion for improvement.

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## 2 BACKGROUND

### 2.1 The need for this application note

Section 2.5.1 of Yellow Book 4, volume 1 says:

*“Sometimes the risk comes completely within accepted standards that define agreed ways of controlling it. [...] In that case, showing that you have met these standards will be enough to meet your legal obligations.*

*“However, where the risk is not completely within accepted standards, you cannot rely on them to achieve safety on their own. They may not properly cover your situation or there may be reasonably practicable improvements on them that reduce risk further. Before you decide that just referring to standards is enough, make sure that:*

- *the equipment or process is being used as intended;*
- *all of the risk is covered by the standards;*
- *the standards cover your situation; and*
- *there are no obvious and reasonably practicable ways of reducing risk further.”*

There was also a similar statement in Yellow Book 3. So it has been recognised for a while that some Yellow Book guidance should be applied differently in certain circumstances where standards are applicable. However the Yellow Book has only contained limited guidance on:

- how to decide whether just referring to standards is enough; and
- what this actually means in practice.

This application note extends the guidance in these areas.

### 2.2 Standards and authoritative good practice

Up until this point in this note, we have used the word ‘standard’ rather loosely. From now on we will reserve it for a document which contains mandatory requirements to standardise aspects of the form, fit or function of an item or aspects of the way in which a task is performed.

Standards are normally associated with a formal process for requesting change and for approving a decision to depart from them.

We will use the term ‘authoritative good practice’ to refer to authoritative, published guidance which contains recommendations to standardise aspects of the form, fit or function of an item, or aspects of the way in which a task is performed.

Notes.

- *Our term ‘standard’ corresponds to ‘rule’ in ‘Taking Safe Decisions’ [2].*
- *Our term ‘authoritative good practice’ corresponds to ‘good practice’ in [2] but [4] reserves the terms ‘authoritative good practice’ and ‘good practice’ to mean ‘standards for controlling risk which have been judged and recognised as satisfying the law’, which is a much smaller set of documents.*
- *Some documents that would have the word ‘standard’ in their title fall into our ‘authoritative good practice’ category. As an example, British Standards are generally not mandatory in railway applications.*

We use the term ‘standards and/or authoritative good practice’ or ‘SAGP’ for short as a collective noun to cover both.

SAGP varies in authority, purpose and scope. You cannot assume that, just because a document bears the word ‘standard’, it contains the best way of doing something. While some standards may carry great authority as the result of a rigorous drafting process, involving experienced professionals, and feedback from an extended period of use, other SAGP may fall well short of this.

The same document may carry different authority in different circumstances. For example, in the UK, Railway Group Standards are mandatory on the main national network but not in depots and some sidings. Or, as a second example, in the European Union at the time of writing, Technical Specifications for Interoperability (TSIs) are mandatory under certain circumstances to certain parts of the national network but do not apply to the London Underground railway.

Many known railway hazards are controlled through SAGP. It is essential to the safety of the railway that railway people should:

- comply with standards that apply to their work or follow the proper processes for approving departures (see below);
- take account of good practice;
- stay alert to departures from SAGP; and,
- if they find any departures from SAGP, bring them promptly to the attention of someone who can deal with them.

However, SAGP on its own may not effectively mitigate risk because circumstances may arise that were not considered by the originators of the SAGP.

SAGP documents do not normally include a comprehensive account of which risks, and which aspects of these risks, that they control or of the circumstances under which they are effective; the relationship between their requirements and hazards is often implicit.

Some SAGP specifies precisely how risk should be controlled while other SAGP, such as standards for signal sighting, defines a process which embodies an element of judgement.

## 2.3 UK Law

We offer a brief summary of relevant aspects of UK law in this section but we do not attempt to offer a comprehensive or authoritative guide. If you need such a guide you may find documents published by the Department for Transport, the Office of Rail Regulation (ORR) and Rail Safety and Standards Board (RSSB) of value. Some of the pieces of law described below were being updated when this application note went to print so you should check if they have been changed by the time you read this.

The **Health and Safety at Work etc Act 1974** gives employers a duty to ensure, 'so far as is reasonably practicable' the health, safety and welfare of their employees and of any other people affected by their work. This is sometimes rephrased in terms of a duty to control and reduce risks as low as reasonably practicable.

*Note: 'so far as is reasonably practicable' and 'as low as reasonably practicable' are often abbreviated SFAIRP and ALARP, respectively.*

It has been an accepted principle of health and safety regulation for some time that one means of demonstrating that this duty has been discharged is by showing that 'good practice' has been followed. The ORR has responsibilities for enforcing the Health and Safety at Work etc Act 1974 on the railways and in its publication [4], it states: "Where relevant good practice is a good fit to the circumstances, then decisions on risk reduction action are straightforward". It must be recognised that the ORR uses the term 'good practice' to cover only a subset of what we would regard as 'SAGP' and even then that there are circumstances where they do not consider that following good practice is sufficient.

This rapidly becomes complex and technical and it is probably best, in the context of this document, to just state that there are circumstances when compliance with SAGP is sufficient to discharge the duty of care under the Health and Safety at Work etc Act 1974 but it should not be assumed that this is generally the case.

We do, however, note that TSIs are railway standards with a privileged position in law. The ORR's opinion on the matter is stated in [4] as follows:

*"[...] if there is any direct conflict between the requirements of the Health and Safety at Work etc Act, 1974 (HSWA) to reduce risks SFAIRP on the one hand, and the level of safety required by a TSI on the other, the level of safety required by the TSI will take precedence, even if the level of safety imposed by the TSI is lower than that required under UK domestic law, including HSWA.*

*"However, it is important to bear in mind that TSIs apply to individual subsystems only. Under HSWA, duty holders have a responsibility to ensure that all system level risks are reduced SFAIRP."*

It should be noted that this is an interpretation of the law that is not universally accepted and which, at the time of going to print, had not been tested in a court of law.

The **Railways and Other Guided Transport Systems (Safety) Regulations 2006** ('ROGS Regulations') require that a 'transport operator', a term which includes infrastructure managers and transport undertakings, should have a Safety Management System (SMS) in place to ensure the safe management of its operation.

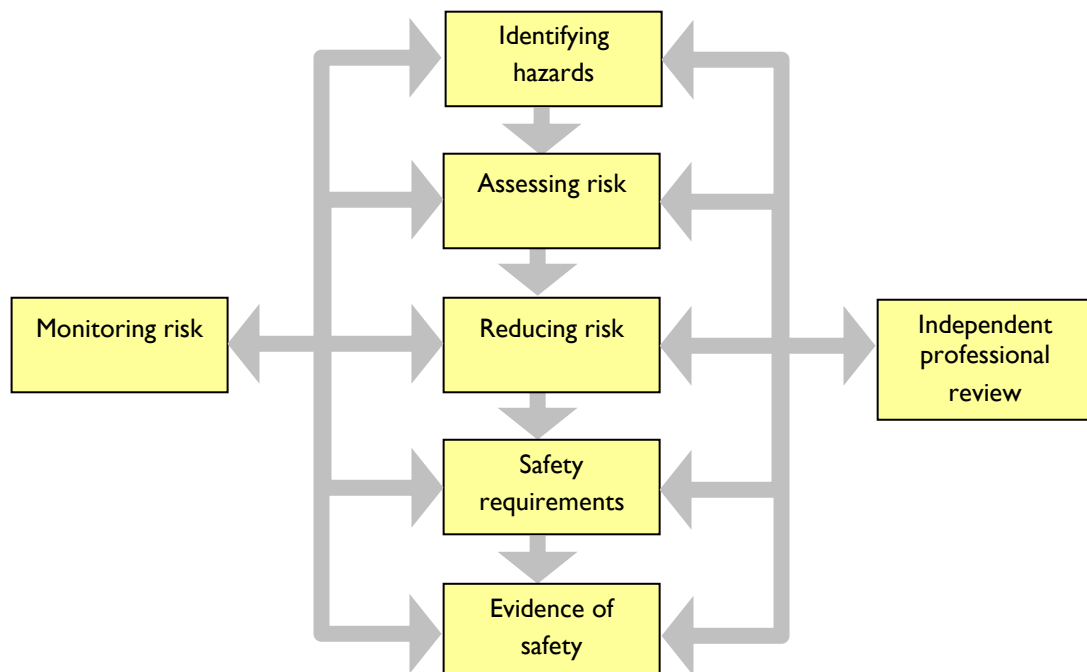
The ROGS Regulations include requirements for transport operators to co-operate, recognising that effective control of railway-level risk requires such co-operation because there are so many dependencies and interfaces that must be managed in order to control hazards.

*Note. When we wrote this application note, a European regulation on the adoption of a common safety method on risk evaluation and assessment was in preparation, which would harmonise processes for assessing risk and deciding whether it was acceptable across the main European railway network (but not metros, trams and other light rail systems). This regulation would cover topics that are addressed in this note, so, if it would apply to you, then you may wish to establish whether it has been issued before applying the guidance in this note.*

### 3 GUIDANCE

#### 3.1 Standards and the Yellow Book

If you are relying on SAGP to control risk then this will affect the manner in which you put certain fundamentals into practice. The affected fundamentals are shown in Figure 3-1.



**Figure 3-1 The Yellow Book fundamentals affected by the use of standards**

We do not consider that the application of the other fundamentals is significantly affected.

#### 3.2 General remarks

Railway safety relies on the skill, experience and diligence of railway professionals. The uncritical application of SAGP is insufficient on its own to ensure safety. A paper [3] published by the Industry Standards Co-ordination Committee, convened by RSSB, puts it well:

*“Standards are not a defence against incompetence. Safety is delivered by applying sound professional judgement and competence, and common sense to the selection and application of appropriate standards.”*

Figure 3-2 provides a practical illustration of how standards that operate well at sub-system or component level can give rise to problems at system level. It shows a very temporary arrangement installed near a lift at a station. The glass wall (conforming to standards) is designed to be difficult to scale. The two-level handrail and seat (conforming to standards) are designed to assist passengers, particularly those of limited mobility, but combine to offer a ladder up the wall, defeating its design.

The problem was quickly spotted and, with experience, judgement and common sense, resolved before handover into service.



**Figure 3-2 An unfortunate interaction between standards**

People who write standards cannot foresee everything, so there must always be room for experience, judgement and common sense. On the other hand, it is unnecessary to try and confirm by formal risk assessment that every application of every piece of SAGP reduces risk ALARP. For example, it would clearly be nonsense to challenge the standard gauge every time we laid track.

This seems like a stalemate. We have to apply judgement to the application of standards and this judgement must surely be based on some assessment of the risk but we cannot carry out risk assessment for each application. However this apparent stalemate is resolvable in two ways:

- Firstly, by recognising that while ‘formal’ risk assessment, with formal techniques such as Hazard and Operability Studies (HAZOP) and formal assessment reports, is a relatively new invention, engineers have always performed informal risk assessment, in the sense of taking a cool look at a plan and looking for things that can go wrong, as an integral part of their work.
- Secondly, by recognising that where those who are applying standards do not have all the skills and knowledge to judge whether they are appropriate or not, they can in general rely on their organisation’s central engineering and/or risk management functions to keep standards and risk under review.

It is important though, to restate that anyone who spots a situation that they think is dangerous and that is beyond their authority or competence to resolve should bring it promptly to the attention of someone who can resolve it (as called for by the **Communicating safety-related information** fundamental), regardless of whether it arises from failure to follow SAGP, deficiencies in SAGP or some other reason entirely.

### 3.3 Overall process

Figure 3-3 illustrates the approach that we suggest taking when making a decision as to whether SAGP is sufficient to control risk.

The steps in this process performed by those responsible for applying the SAGP are shown in yellow as follows:

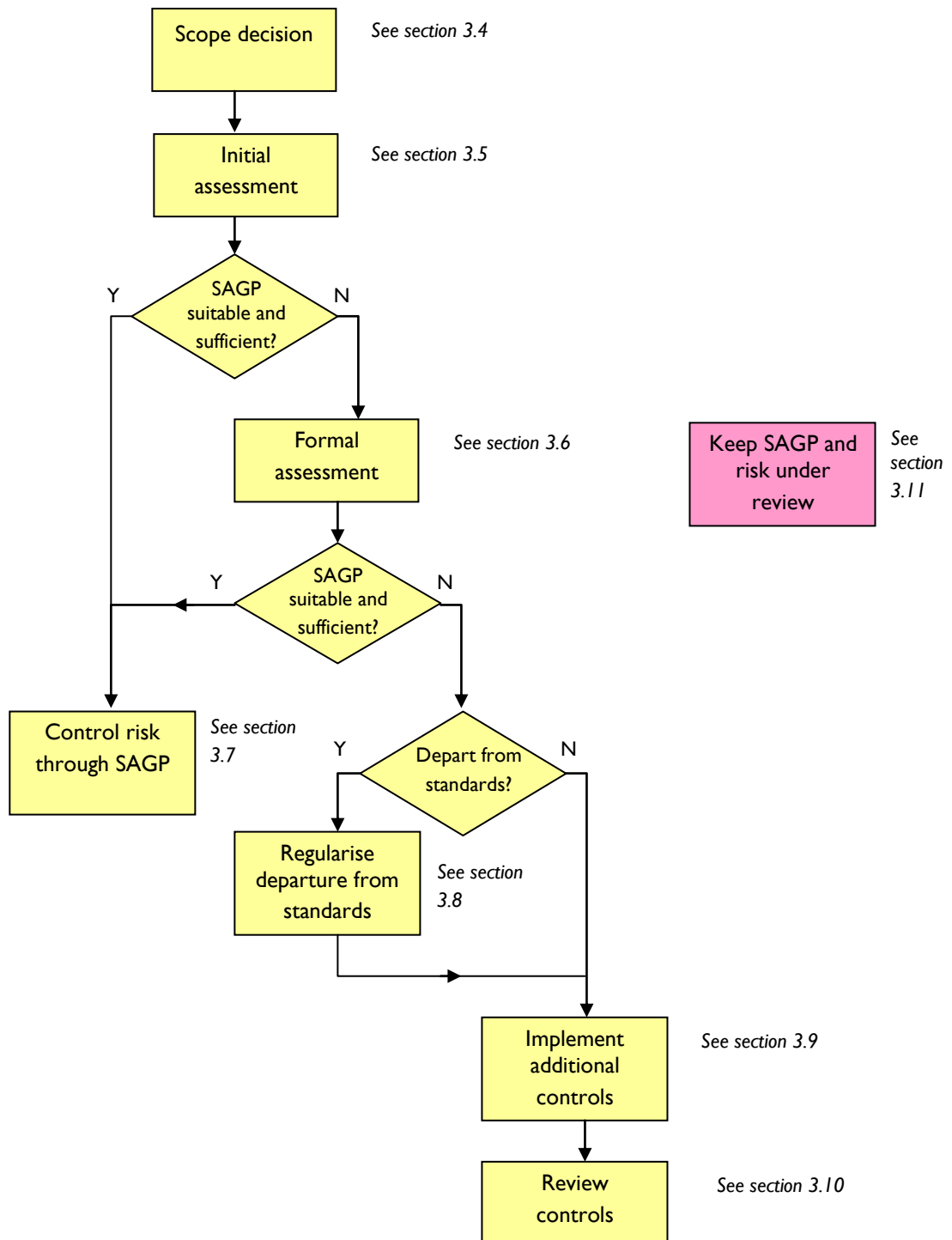
- **Scope decision.** Make sure that you are clear what SAGP you are applying and what you are applying it to.
- **Initial assessment.** Consider whether the SAGP is obviously suitable and sufficient to control risk. You may decide that SAGP is unsuitable for reasons quite unrelated to risk – because using the SAGP would be unreasonably expensive for instance. If you are sure that the SAGP is suitable and sufficient the process proceeds down the left-hand branch. If the SAGP is unsuitable or insufficient, or if you are in doubt, the process proceeds down the right-hand branch.

*Note. These first two steps should be performed using common sense and professional judgement. They may be performed quickly with little or no records.*

- **Control risk through SAGP.** This step simply covers the application of the SAGP – in most cases this will be routine ‘business as usual’.

- **Formal assessment:** Consider again whether the SAGP is suitable and sufficient to control risk, but this time following a systematic process with documented results. If the SAGP is unsuitable or insufficient, formulate additional 'controls', that is, measures to control risk. There are two cases here that will make a difference later in the process:
  - You decide to comply fully with the SAGP and to implement *additional* controls.
  - You decide to do something *different* from the SAGP.
- **Regularise departure from standards.** If you are doing something *different* from the SAGP and the SAGP is mandatory, that is, it is a standard, then you will generally need to follow some defined procedure for agreeing the departure and informing others who need to know.
- **Implement additional controls.** This step simply covers the implementation of the decisions taken in the previous step.
- **Review controls.** This step involves looking back at the controls after implementation, in order to establish whether they have been as effective in controlling risk as they had been assessed to be (and, if not, potentially initiating action to control risk further).

One of the reasons that the informal assessment described above can be so brief in many cases is that those applying the SAGP can rely on the fact that the SAGP is kept under ongoing review at a general level. This ongoing process is shown as a separate box in the diagram, **Keep SAGP and risk under review**. The process is shown in pink to highlight the fact that it is normally carried out by different people from those performing the yellow steps.



**Figure 3-3 A practical approach to deciding whether SAGP is sufficient to control risk**

### 3.4 Scope decision

During this step you should make sure that you are clear:

- what SAGP you are considering applying;
- what you are applying it to; and
- who should take the decision as to whether it is suitable and sufficient.

This may all be perfectly clear, in which case proceed directly to the next step. However if you are in any doubt you should resolve that doubt before proceeding further.

### 3.5 Initial assessment

This assessment involves considering whether the SAGP is suitable and sufficient to control risk. These are different tests.

You may decide that SAGP is unsuitable for reasons quite unrelated to risk – because using the SAGP would be unreasonably expensive, for instance. Alternatively, technological advances may render standards unsuitable. If you are about to install railway track on concrete slabs and your standards assume that track is laid on sleepers, then your standards will not be completely suitable to the job.

As for sufficiency, when preparing to undertake a task which is governed by the relevant SAGP, that appears, at first sight, to control all the risk, then we would expect any railway professional to give some thought to the hazards involved in order to confirm to their satisfaction that:

- the equipment or process is being used as intended;
- all of the risk is covered by the standards;
- the standards cover the situation; and
- there are no obvious and reasonably practicable ways of reducing risk further.

Of course, it may already be clear that a more formal assessment is going to be necessary without considering SAGP. For instance, the ROGS Regulations require organisations to have procedures and methods for carrying out risk assessment when making a change to the railway which gives rise to new risks.

Some SAGP does not prescribe what you must do in order to comply with it; instead it outlines objectives and processes to achieve the objectives. Such SAGP often explicitly requires a formal risk assessment but, even if it does not, it is unlikely to be sufficient to control risk.

We do not know how to define a mechanical procedure for doing this risk assessment effectively. We need people to think and we remain reliant on the skill, experience, professionalism and diligence of those whose responsibilities include an element of risk assessment.

We would not expect anyone to go beyond their skills and knowledge in reaching such a judgement but, if a member of staff is asked to apply standards without possessing the skills and knowledge to assess their suitability, then we would expect that someone else in the organisation would be reviewing the suitability of the standards.

The effort that it would be sensible to expend on this assessment will depend upon the circumstances. We expect people who are responsible for checking the adequacy of SAGP to use their judgement in deciding where they should spend their time. Where the situation is a routine application of the SAGP, and the SAGP is authoritative, it would be sufficient just to look for any non-routine aspects of the application which might give rise to problems.

So for example, if there is a need to replace a relay on a train, and a standard, approved replacement is available, we would not expect the technician concerned to give the job more than a few moments' thought before fitting the standard replacement according to the standard procedure. But we would still expect them to keep alert and thinking – if a batch of relays is failing far more frequently than would be expected, some action may be required.

If you are sure that the SAGP is suitable and sufficient, the process proceeds to the **Control safety through SAGP** step. If the SAGP is unsuitable or insufficient or if you are in doubt, the process proceeds to the **Formal assessment**.

It is generally desirable to maintain some sort of record that the SAGP has been found suitable and sufficient, but this record may be very brief and does not have to be repeated for every application. So a signature of a competent person approving a work instruction which refers to SAGP might be sufficient.

*Note: This step in the process fully or partly implements the **Identifying hazards and Assessing risk** fundamentals.*

### 3.6 Formal assessment

If the initial assessment cannot confirm that SAGP is suitable and sufficient, then it will be necessary to perform a formal assessment and to use the findings of this in order to formulate a course of action that reduces risk to an acceptable level.

This step may involve reconsidering whether the SAGP is suitable but this is normally a fairly straightforward decision and probably one that has been settled at the initial stage; in practice, this step will focus on looking again to see if the SAGP is sufficient to control risk but this time following a systematic process with documented results and continuing until a definite conclusion is reached.

The main body of Yellow Book 4 contains extensive guidance on formal assessment. The guidance related to the **Identifying hazards, Assessing risk, Reducing risk** and setting **Safety requirements** is relevant. This guidance includes, in chapter 15 of volume 2 of Yellow Book 4, the advice that “*the sophistication and depth of risk assessment should be proportionate to the level of the risk.*” So, in some cases, risk assessment may be a straightforward, qualitative process based upon professional judgement, and, in other cases, a more rigorous, quantitative process may be required.

So ‘formal’ does not mean that the process has to be bureaucratic or the paperwork has to be extensive.

If the SAGP is unsuitable or insufficient, then this process will include the formulation of additional ‘controls’, that is, measures to control risk, the assessment of the risk with these controls in place and the demonstration that this reduced risk is acceptable. There are two cases here that will make a difference later in the process:

- You decide to comply fully with the SAGP and to implement *additional* controls.  
For instance, when maintaining track in a tunnel which suffers from ingress of polluted groundwater, it may be necessary to add processes to jet-wash the track at regular intervals in addition to the standard operations.
- You decide to do something *different* from the SAGP.  
For instance, when building a new railway with track laid on concrete slabs instead of on sleepers, you may decide not to install a walkway alongside it if the walkway only needs to be used by maintainers and routine maintenance can be accomplished entirely at times when trains are not running.

If it can be shown that there are reasonably practicable alternatives or additional measures that would reduce risk further than the application of SAGP alone, and these measures would not conflict with other legal obligations, then there is a legal obligation in the UK to take them. However, where a project has found SAGP to be suitable and sufficient and has correctly applied it, then we would expect anyone who argued that an alternative or additional measure was required to support their arguments with evidence that the measure was necessary to achieve the legally-required level of risk.

It is possible, as Figure 3-3 shows, for this assessment to conclude that the application of SAGP does indeed provide satisfactory control of the risks.

Many hazards require co-operation between multiple parties to control them. In such cases it will be necessary for the party performing this step to co-operate with others to ensure a co-ordinated approach to the control of risk.

You should bear in mind that much SAGP is formulated in order to ensure the compatibility of different parts of the railway upon which the safety and viability of the railway depends. If you are changing part of the railway, you will need to ensure that it remains compatible with the rest of the railway whether or not you employ SAGP. But, if you depart from SAGP, you may increase the risk of incompatibility and you may need to take additional measures to control this risk.

RSSB's publication 'Taking Safe Decisions' [2] describes a consensus view, within the UK rail industry, on how decisions that affect safety should be taken.

Railway Group Standard GE/RT8270 [5] defines a process for the assessment of compatibility between infrastructure and rolling stock on the UK national network, which is mandatory when changing either infrastructure and rolling stock.

Railway Group Guidance Note GE/GN8561 [6] also provides guidance on performing risk assessments on the UK national network. It has been recently withdrawn but, at the time of writing, there were plans to revise its content and transfer the revised guidance to a new publication.

### 3.7 Control risk through SAGP

If it has been concluded that the application of SAGP does indeed provide satisfactory control of the risks then the application of the SAGP will implement the **Reducing risk** and setting **Safety requirements** fundamental.

The **Evidence of safety** fundamental will be implemented by keeping records of the correct application of the SAGP.

The **Independent professional review** will be implemented by the process used to review the SAGP supplemented, in some cases, by independent checking of the application of the SAGP, where the SAGP itself calls for this. An example of the latter would be the independent testing processes built into signal engineering standards. There are a few circumstances, for example where European interoperability legislation applies, where standards require that checking must be done by a different organisation from the one doing the work. More usually, the checking will be done by someone from the same organisation.

### 3.8 Regularise departure from standards

If you decide that the application of SAGP is not sufficient to control risk, then it is possible that the course of action that you choose will be to comply with the SAGP but to take further steps as well. It is also possible that you may end up deviating from the SAGP. If the SAGP documents are mandatory, that is, if they are standards, you should regularise any departures from them or you may do more harm than good.

If a standard represents an agreement between parties on some aspect of an interface between them, then any party that wishes to depart from that standard should only do so in co-operation with the other affected parties, and should provide adequate documentation of the departure for the benefit of parties affected by it in the future.

Other risk control measures may be based on the assumption that SAGP will be followed, so, if you depart from SAGP, you should consider whether this decision may have any knock-on effects on other systems that could affect safety.

However, not all standards relate to interfaces (and not all interfaces are covered by standards).

If a standard is the subject of a formal derogation process, then any party that wishes to depart from that standard should either get the standard changed or follow the formal derogation process before departing from the standard. In some cases compliance with these processes may be required by law.

*Note. Many derogation processes will require that a formal risk assessment must have been carried out.*

### 3.9 Implement additional controls

This step simply involves taking any additional control measures defined in the formal assessment. The guidance associated with the **Evidence of safety** fundamental in chapter 18 of volume 2 of Yellow Book 4 may be applied to do this. Note that, as the guidance says, this does not necessarily involve preparing a safety case. There are other effective ways of collating evidence of safety and, just because a formal assessment has been done, it does not follow that a safety case is required.

### 3.10 Review controls

If you are implementing 'non-standard' controls, then you will generally be doing something for which there is limited practical experience and relying, to some extent, on a theoretical analysis. It is good practice to check, when you have more practical experience, whether this confirms your analysis.

This step involves looking back at the controls after implementation to establish whether they have been as effective in controlling risk as they had been assessed to be (and, if not, potentially initiating action to control risk further).

### 3.11 Keep SAGP and risk under review

One of the reasons that the informal assessment described above can be so brief in many cases is that those applying the SAGP can rely on the fact that the SAGP is kept under ongoing review at a general level.

Any railway organisation should have processes for identifying and assessing areas of risk across its whole range of activities. We would expect these processes to:

- monitor advances in technology and good practice, including good practice in other industries;
- look for and react to new information (such as accidents, incidents, changes to the infrastructure, and the introduction of novelty into the railway) which may suggest areas of risk which are not fully covered by SAGP (as called for by the **Monitoring risk** fundamental);
- compare measures of the actual risk encountered with targets; and
- initiate action, where necessary, which may include changing SAGP or putting in place measures to supplement or replace those already defined in SAGP.

By working collectively to identify these areas so that effort can be focussed on them, the railway industry can work effectively to prevent accidents.

We would expect a railway organisation to be able to show that it has effective processes for identifying and assessing areas of risk across its whole range of activities that are not fully covered by SAGP and for which alternative or additional measures will be required. We would expect these processes to be formalised and, if the railway organisation is a transport operator, then we would expect these processes to form part of its Safety Management System, as required by the ROGS Regulations.

## 4 REFERENCED DOCUMENTS AND FURTHER READING

1. Yellow Book 4 volumes 1 & 2 and website, [www.yellowbook-rail.org.uk](http://www.yellowbook-rail.org.uk)
2. Taking Safe Decisions - how Britain's railways take decisions that affect safety, RSSB, parts 1, 2 and 3, document reference GD-0001-SKP, Rail Safety and Standards Board, 2008, available from [www.rssb.co.uk](http://www.rssb.co.uk)
3. Role of Standards in System Interface Safety, ISCC working paper, item 3.5, 14 December 2007, available from [www.rssb.co.uk](http://www.rssb.co.uk)
4. ORR guidance and general principles for assessing whether health and safety risks on Britain's railways have been reduced so far as is reasonably practicable, available from [www.rail-reg.gov.uk](http://www.rail-reg.gov.uk)
5. Railway Group Standard GE/RT8270, Assessment of Compatibility of Rolling Stock and Infrastructure, issue 2, 1 October 2007, available from [www.rgsonline.co.uk](http://www.rgsonline.co.uk)
6. Railway Group Guidance Note GE/GN8561, Guidance on the Preparation of Risk Assessments within Railway Safety Cases, issue 1, June 2003 (withdrawn December 2008), available from [www.rgsonline.co.uk](http://www.rgsonline.co.uk)

## 5 ABBREVIATIONS

ALARP	As Low As Reasonably Practicable
DfT	Department for Transport
HAZOP	Hazard and Operability Study
HSWA	Health and Safety at Work etc Act 1977
ORR	Office of Rail Regulation
ROGS	The UK Railways and Other Guided Transport Systems (Safety) Regulations 2006
RSSB	Rail Safety and Standards Board
SAGP	Standards and Authoritative Good Practice
SFAIRP	So Far As Is Reasonably Practicable
SMS	Safety Management System
TSI	Technical Specification for Interoperability

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