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Assessing whether risks on Britain's railways have been reduced SFAIRP			
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RIG postholder/owner		Kristina Barbet, Health and safety risk policy specialist	
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Summary	<p>This RIG sets out how we assess whether health and safety risks on Britain's railways have been reduced so far as is reasonably practicable (SFAIRP). It summarises how we:</p> <ul style="list-style-type: none"> • apply the SFAIRP test (including in deciding whether duty holders' safety management systems reduce risks SFAIRP); and • consider strategic health and safety investment decisions. <p>The RIG has been updated to include content on what to include in a cost benefit analysis which was previously found in a separate internal guidance document on CBA. Additional references for further information relevant to CBA have also been added to this RIG. The pre-existing content of this RIG has not been reviewed as part of the update.</p>		
Original consultation	Jen Ablitt Deputy Director Safety Strategy, Policy and Planning Jake Brown, Deputy Director Legal Services, Kristina Barbet, Health and Safety Risk Policy Specialist		
Subsequent consultation (reviews only)	Matt Farrell, Garry Stimpson, Eryl Marsh, Kristina Barbet, Paul Appleton, Sarah Shore, Richard Hines, Jen Ablitt, ORR legal team		

Detail

Ensuring our decisions are lawful and maintaining our regulatory credibility, means we must be consistent in our decisions on health and safety duties qualified by “so far as is reasonably practicable” (SFAIRP)^{1 2}

There are two key elements:

- understanding the legal concept of SFAIRP, as applied by the courts; and
- our expectations of duty holders when they assess whether risks have been reduced SFAIRP.

Legal duties

The Health and Safety at Work etc Act 1974 (HSWA) places general duties on employers to:

- ensure, SFAIRP, the health, safety and welfare at work of their employees (s.2.); and
- conduct their undertakings to ensure, SFAIRP, that they do not expose non-employees to risks to their health and safety (s.3).

These general duties are supplemented by other health and safety legislation.

Duty holders must make a suitable and sufficient assessment of risks and, where considering duties constrained by SFAIRP, must compare the cost of implementing risk control measures (in terms of money, time and effort) against the reduction in risk those measures might achieve, and whether there is gross disproportion between them, such that the costs grossly outweigh the risk reduction.

Edwards v. NCB

This case ³ provides the key interpretation of SFAIRP: duty holders must implement control measures unless the costs involved are grossly disproportionate to the safety benefits achieved. Some duty holders may decide to implement measures that go beyond SFAIRP for business or commercial reasons: that does not necessarily affect what may be reasonably practicable for that activity.

Good Practice

Duty holders should, as a minimum, follow relevant good practice (which is not necessarily the same as general industry practice). Most railway duty holders' day-to-day decisions are based on current good practice as captured by industry's standards. Duty holders should keep good practice under review, as it changes over time. We should challenge industry standards if we have evidence that they do not deliver risk control to the level required by SFAIRP, or ensure additional controls are put in place to reduce risks SFAIRP. Risk assessment tools such as the Rail Safety and Standards Board (RSSB) Safety Risk Model, can provide a useful and valid input into the risk assessment and investment decision making process.

What we expect of duty holders

In approaching risk reduction duty holders are generally required to:

- carry out suitable and sufficient assessments, appropriately recorded, of risks to the health and safety of both employees and non-employees affected by their undertakings;
- identify and implement the measures needed to deliver appropriate risk controls including, where appropriate, an estimation of the potential costs and benefits of additional control measures;
- decide whether there is gross disproportion and, if not, then:

- develop an appropriate plan and timetable to implement any additional risk control measure identified. The recording/documentation/analysis should be proportionate to the risk (foreseeable consequence/impact); and
- carry out regular reviews of both the assessments and control measures.

Assessing the risks

Employers must assess the health and safety risks to their employees at work and others (such as passengers, other workers, and the public) who may be affected by their work activities. This includes risks shared with other duty holders, other interface risks and risks associated with low probability but high consequence incidents, especially if the risk arises from a new hazard. Duty holders do not need to consider any socio-political response to multi-fatality incidents; this is a matter for government and regulators.

The assessment of risk and SFAIRP must be made at the level of the activity that could give rise to harm. So, for example, if a work activity on a specific piece of equipment could give rise to fatal injury, and the precautions (for that piece of individual equipment) cost a proportionate amount relative to that outcome, then those precautions should be implemented, even if there are many similar items of such equipment across the duty holder's business. In other words, the calculation of gross disproportion should **not** be based on the total cost to implement the precautions across **all** the items of equipment.

For many SFAIRP decisions we do not expect duty holders to undertake a detailed cost benefit analysis (CBA). A simple comparison of costs and benefits may suffice and can help to determine whether a measure is necessary to ensure safety SFAIRP. For major health and safety decisions duty holders may benefit from undertaking a more thorough CBA. Decisions should not be unduly influenced by small changes in the underlying assumptions made in the CBA.

Cost benefit analysis

CBA can help to inform decision making but should not form the sole argument in showing that risks are being reduced SFAIRP. Most day-to-day health and safety decisions will not require a quantitative CBA assessment to determine what is reasonably practicable. When making this judgement we would expect particular attention to be paid to:

- the level of uncertainty in the assessment of costs and safety benefits; and
- the range of potential safety consequences.

We would not generally require schemes with mainly commercial benefits to be used to achieve small safety benefits. However, if duty holders decide (for commercial reasons) to undertake such a scheme, any reasonably practicable modifications which improve safety should be implemented.

¹ SFAIRP is widely used in British health and safety legislation.

² As low as reasonably practicable (ALARP) is a term that is sometimes used by duty holders and intended to be synonymous with "so far as is reasonably practicable". However, ALARP is not recognised within HSWA (unlike SFAIRP) and so, in the interest of clarity; ALARP is not used within this guidance.

³ *Edwards v National Coal Board* [1949] 1 ALL ER 743 at 747

What should be included in a CBA?

Costs : the costs (in terms of money, time and effort) are those necessary to implement the measures to reduce risk, and include any consequent productivity losses. Whether the duty holder can afford the cost of a control measure is not relevant to deciding whether a measure is reasonably practicable. The costs to be included in a CBA should be the net costs to the duty holder of introducing the safety measure. Only those costs shown to relate to the safety measure being assessed should be included. We would expect those costs to include:

- a) Costs of installation, operation, training, any additional maintenance, and other costs (e.g. possessions compensation payments on the mainline railway⁴) that would result from suspending any services in order to put the measure in place.
- b) Only those costs incurred by the duty holder, (costs incurred by other parties, for example members of the public, should not be counted). However, the costs to the duty holder should include the costs of mitigation measures, for example compensation. Costs associated with passenger inconvenience or using alternative transport that are not incurred by the duty holder should not be included.
- c) An appropriate allowance in scheme costs for optimism bias⁵
- d) Ongoing revenue losses as a result of the measure (for example if trains are slowed down).

Any savings as a result of the measure (for example reduced operational costs such as avoiding damage and reinstatement costs, if relevant; or for the mainline network, those due to reduced performance regime compensation payments where these are significant⁶) should be offset against the above costs. These are not considered safety benefits but are counted as cost savings because they reduce the overall cost of putting a measure in place.

Where revenue losses are a strong influence on a decision not to implement a measure, the duty holder should show that phasing or scheduling the work to coincide with planned closures (for example closing the line for maintenance) would not change the decision. To minimise costs, duty holders should try and implement the measures on trains when they are already being maintained or on the infrastructure when it is not being used or is already closed for other reasons.

Converting costs into monetary values is often uncertain and all costs should be justified.

Financing Costs

Financing costs should be included in the CBA to reflect that if a business invests £100 in a piece of safety equipment, it is unlikely that the total cost of this investment for the business was £100 exactly. For example, if the business has had to borrow

⁴ On the mainline railway train operators are compensated through Schedule 4 of their track access agreement when Network Rail takes possession of the railway, for example due to engineering works. Schedule 4 provides compensation for revenue losses and some costs.

⁵ Further details on optimism bias are included in the [Treasury Green Book](#) and [Unit A1-2 on scheme costs](#) in the Department for Transport's transport analysis guidance [Web TAG](#)

⁶ On the mainline railway train operators are compensated through Schedule 8 of their track access agreement for revenue losses due to lateness and cancellations attributed to Network Rail or other train operations.

this money from a bank it will pay interest on that £100 and may incur arrangement fees.

Benefits : the benefits to be included in the CBA are the benefits in terms of improved health and safety. This should include all the reduction in risk to passengers, workers and members of the public. Only those risk reductions shown to relate to the safety measure being assessed should be included.

Where possible, the changes to risk should be estimated using an appropriate risk model. Where the risks are difficult to quantify, a similar depth of analysis might be applied using qualitative techniques such as structured workshop assessments supported by expert judgement.

In a railway context, health and safety benefits should be valued using the most recent WebTAG guidance. Following the guidance this consists of two stages:

- First the health and safety benefits are quantified using the metric “fatalities and weighted injuries” (FWI). The guidance sets the statistical values of major and minor injuries in relation to the value of preventing a fatal injury. For the mainline network for major injuries it is currently 1/10 of the statistical fatality value and for reportable minor injuries (and Class 1 shock/trauma) it is 1/200 of the fatality value. For non-reportable minor injuries (and Class 2 shock/trauma) it is 1/1000 of the fatality value.
- Second, the total FWI are monetised by applying the value of preventing a statistical fatality (VPF). The VPF figure is produced by the Department for Transport and set out in their WebTAG guidance. RSSB publishes an annually updated VPF figure on their website. The 2024 figure can be found on RSSB’s website [Taking Safe Decisions - Cost-Benefit Analysis](#)

Using a consistent price base

To carry out a CBA, where possible costs and benefits should be expressed in monetary terms. However, even where costs and benefits are both in monetary values they still may not be on a comparable basis. To ensure consistency, the costs and benefits should be expressed in:

- Market prices, i.e. gross of VAT;
- Real terms, using consistent price base e.g. 2015 prices; and
- Consistent values.

Discounting

If the costs and benefits of the measure take place over time, they need to be brought together into a single present value by discounting future costs and benefits. The law imposes health and safety obligations on duty holders because of the benefits this provides to society. Therefore, we consider that costs and benefits should be discounted using public sector discount rates. These are found in the government’s guidance on options appraisal and evaluation known as the The Green Book⁷. Annex A6 covers discounting in appraisal.

⁷ <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

Costs and benefits should be assessed over the life of the measure. For example, if the measure is expected to last 10 years before it is replaced then costs and benefits should be taken into account for a 10 year period.

Treatment of risk and uncertainty

When carrying out a CBA, duty holders are likely to have limited information about some of the main inputs such as the frequency of events and the likely consequences. Costs and risk estimates are therefore subject to uncertainty. Duty holders should provide best estimates and adequate justification for the numbers they have used. We would expect duty holders to conduct sensitivity tests to identify how the CBA would be affected by changes in those inputs where there is uncertainty. Sensitivity analysis consists of varying one or more of the parameters/assumptions of the CBA to see how these variations affect the CBA outcomes. We would expect sensitivity tests to include an assessment of costs with and without risk allowances and optimism bias⁸ The judgement of what is reasonably practicable should take into account the results of the sensitivity tests and the level of uncertainty about costs and safety benefits.

Removal of existing control measures

Removing existing control measures is usually only acceptable where circumstances have changed, (for example, where risks have been removed or controlled by another measures), there are changes in the understanding of the hazard, or the costs of continuing the measure are clearly grossly disproportionate to the risk reduction it achieves.

Further information

ORR guidance

[Risk management | Office of Rail and Road](#)

Health and Safety Executive (HSE) guidance

[Expert guidance on risk management - HSE](#)

[Managing risks and risk assessment at work](#)

Explanation of the basis for HSE's regulatory decision making

[Reducing Risks Protecting People \(R2P2\)](#)

Railway industry consensus view on taking safety decisions

[Taking-Safe-Decisions-2019.pdf](#)

Department for Transport, Transport Analysis Guidance WebTAG

[Web TAG](#)

⁸ Further details on optimism bias are included in the Treasury Green Book, and in rail specific context from para 2.5 of Unit A5.3 of WebTAG