

## **Internal guidance and general principles for assessing whether health and safety risks on Britain's railways have been reduced so far as is reasonably practicable**

This document outlines the way we expect ORR staff to assess whether risks have been reduced *so far as is reasonably practicable* (SFAIRP) by duty-holders.

### **Purpose and scope**

1. This document provides ORR's inspectors with high-level guidance and general principles, specific to ORR, on applying the concept of SFAIRP. It summarises the approach we take:

- When making decisions that duty holders' safety management systems are capable of ensuring that risks are reduced SFAIRP (both during the assessment of applications for safety certificates and authorisations and in the course of inspections to verify the safety management system);
- On the remaining areas where approval of new works is sought;
- When enforcing health and safety law;
- When preparing guidance (internal or external); or
- When considering strategic investment decisions involving health and safety issues.

### **Background**

2. This document should be read alongside the Health and Safety Executive's '*Reducing Risks, Protecting People*' (R2P2) document and ORR's supporting guidance: '*Internal guidance on Cost Benefit Analysis (CBA) in support of SFAIRP decisions*'.

3. To ensure that our decisions are lawful and to maintain our credibility, we all need to apply consistent standards in relation to health and safety duties qualified by SFAIRP. As part of this, we should:

- Clearly understand the legal concept of SFAIRP, as interpreted by the courts and applied by ORR and other health and safety enforcement authorities;
- Clearly understand the required level of risk assessment and degree of rigour expected in any SFAIRP evaluation of risks made by duty holders to ensure the risks are reduced SFAIRP; and
- Adopt a common ORR approach to these matters.

### **Legal background**

4. The Health and Safety at Work etc. Act 1974 (HSWA) and the Regulations made under it form the basis for health and safety law in Great Britain. HSWA places general duties on employers to ensure the health, safety and welfare at work of their employees

(section 2) and to conduct their undertaking so that persons not in their employment are not exposed to risks to their health and safety (section 3). Employers must ensure “so far as is reasonably practicable” that these duties are met. This qualification is abbreviated to “SFAIRP”: the concept is used widely in health and safety legislation.

5. Put simply, to demonstrate compliance with the law, railway duty holders are required to go through a process of risk assessment which results in them making a decision about whether they consider that their safety measures are adequate to reduce risks SFAIRP. Duty holders should record the significant findings of their risk assessment. ORR, as the relevant enforcement authority, can challenge the duty holder’s decision, but ultimately only the Courts can decide if the duty holder is complying with relevant legislation and case law.

6. There is little guidance from the courts as to what reducing risks SFAIRP means. The key case is *Edwards v. The National Coal Board*<sup>1</sup>. In that case, the Court of Appeal considered whether or not it was reasonably practicable to make the roof and sides of a road in a mine secure. The Court of Appeal held that:

“... in every case, it is the risk that has to be weighed against the measures necessary to eliminate the risk. The greater the risk, no doubt, the less will be the weight to be given to the factor of cost.”; and

“Reasonably practicable’ is a narrower term than ‘physically possible’ and seems to me to imply that a computation must be made by the owner in which the quantum of risk is placed on one scale and the sacrifice involved in the measures necessary for averting the risk (whether in money, time or trouble) is placed in the other, and that, if it be shown that there is a gross disproportion between them - the risk being insignificant in relation to the sacrifice - the defendants discharge the onus on them.”

7. The Courts will look at all the relevant circumstances of the particular case when reaching a decision.

### **SFAIRP principles and concepts**

8. There are thus two key questions for duty holders:

- Is there more that could be done to reduce health and safety risks?
- Is the sacrifice (in terms of money, time and effort) of doing more grossly disproportionate to the safety benefits achieved?

If the answer to the first question is “yes”, and to the second question is “no” then it would be reasonably practicable for the additional measure(s) to be taken.

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<sup>1</sup> Edwards v National Coal Board [1949] 1KB 704.

9. The effect of this is that suitable controls must be in place to address all significant hazards and that these controls, as a minimum, must achieve the same risk reduction as authoritative good practice<sup>2</sup>, or equivalent.

10. For the purposes of a health and safety regulator seeking to enforce such duties, it can be helpful to categorise risks<sup>3</sup> as unacceptable, tolerable or broadly acceptable, where:

- an **unacceptable level of risk** must be ruled out or reduced to make it at least tolerable, except in exceptional circumstances. If a duty qualified by SFAIRP cannot give this result, we may consider other options, including recommending new Regulations;
- a **tolerable level of risk** is in-between the unacceptable and acceptable regions and the risk must be reduced SFAIRP; and
- a **broadly acceptable level of risk** implies a level of risk that is generally regarded as insignificant, therefore little proactive effort is required to identify measures that reduce the level of risk SFAIRP.

## General principles

11. As Britain's railway health and safety regulator, ORR follows the following general principles:

- **SFAIRP**: ORR expects that duty holders will ensure that health and safety risks are reduced SFAIRP<sup>4</sup>. Duty holders should follow the test for "reasonable practicability" developed by the Court of Appeal<sup>5</sup> and compare the level of risk that might be avoided by implementing a risk reduction measure (in terms of fatalities, injuries or ill-health etc. avoided) with the sacrifice involved in implementation (in terms of money, time and trouble). A risk reduction measure can only be ruled out if the sacrifice involved in implementing the measure is grossly disproportionate to the benefits of the risk reduction.

The level of detail ORR requires about how duty holders decide that risks have been reduced SFAIRP, and the nature of the decision-making process, should be proportionate to the level of risk being considered.

A detailed quantitative demonstration that the measures in place or proposed to manage risk are adequate to reduce risks SFAIRP will rarely be required or appropriate, and would usually be restricted to assessing the introduction of

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<sup>2</sup> As explained in paragraph 11 (ii).

<sup>3</sup> This generally refers to individual risk. However, societal risk (see para. 11 (ix)) can be compared to the same tolerability framework, but currently there are no suitable quantitative societal risk criteria that could be applied in the railway context.

<sup>4</sup> Some legal duties, for example, the duty created by the Railway Safety Regulation, 1999 to install a train protection system, are not qualified by the SFAIRP test.

<sup>5</sup> *Edwards v National Coal Board* [1949] 1 All ER 743.

large-scale control measures with a potentially marginal safety benefit compared to the sacrifice (in terms of money, time and effort) – see supporting guidance: *“Internal guidance on Cost Benefit Analysis (CBA) in support of SFAIRP decisions”*.

- **Good practice:** Good practice is defined for the purposes of this document as:

“the generic term for those standards for controlling risk which have been judged and recognised as satisfying the law when applied to a particular relevant case in an appropriate manner.”<sup>6</sup>

It is not necessarily the same as general industry practice, which may be of a different standard. Our inspectors should, as a minimum, ensure that all relevant good practice, or equivalent, is adhered to. Where the duty holder wishes to adopt a different approach to controlling risk, ORR should seek assurance that the level of risk would be no greater than that achieved by adopting good practice and so those risks are reduced SFAIRP for that different approach. Good practice may be found in Approved Codes of Practice (ACoPs), ORR or HSE guidance, and other standards recognised by enforcing authorities as embodying good practice. This is the minimum compliance standard.

Most of our day-to-day decisions concern the adequacy of measures taken by duty holders, based on the application of current good practice, for controlling risk. However, good practice may not exist for, or be relevant to, some hazards. Where good practice fully addresses the SFAIRP requirements in a specific situation, that will fulfil the duty-holder’s requirement to take explicit account of risk, the sacrifice (in terms of money, time and effort), technical feasibility and the acceptability of residual risk, since these should have been considered when the good practice was established. The duty holder has to be sure, however, that the good practice is relevant and up-to-date, as good practice may change over time. It should be noted that compliance with Railway Group Standards (RGSs) alone might be insufficient to demonstrate that risks are reduced SFAIRP. Indeed, though mandated by licence conditions, RGSs are not intended to achieve this, and all contain a statement to that effect. In many cases, however, i.e. areas of lower risk, compliance with Railway Group Standards is likely to be sufficient.

Some RGSs may not be risk-based, others are high- level, i.e. goal setting, making them insufficient in themselves alone to demonstrate that overall system risk has been reduced SFAIRP. Statements such as ‘we comply with Railway Group Standards and therefore we have reduced risks SFAIRP’ are not acceptable in isolation. Such statements require further justification.

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<sup>6</sup> HSE’s *“Assessing compliance with the law in individual cases and the use of good practice”* document – see: <http://www.hse.gov.uk/risk/theory/alarp2.htm>

There may be circumstances where compliance with RGSs, or other industry or company standards, means that duty-holders go beyond SFAIRP to comply with those standards. Under health and safety legislation, duty holders are not required to take additional actions to go beyond a duty that is qualified by SFAIRP.

- **Risk to be included in a risk assessment:** Only those hazardous events with the potential to affect employees and others (such as other workers, passengers and members of the public) associated with the duty holders' work activities need be addressed. The risk assessment should consider the management of risks shared with other duty holders, for example by considering the arrangements for working together to manage risks that arise from the 'interfaces' between vehicles and infrastructure.
- **Sacrifices:** The sacrifices that should be included in an assessment are only those necessary and sufficient to implement the measures to reduce risk, for example, the cost of installation, operation and maintenance, and the sacrifice (due to any consequent productivity losses such as costs from delayed or cancelled trains). Cost savings or revenue gained by duty holders when instituting a health and safety measure (for example, reduced train operating costs) should be offset against the cost of the measure – see additional guidance: *“Internal guidance on Cost Benefit Analysis (CBA) in support of SFAIRP decisions”*.
- **Affordability:** Whether a particular duty holder can afford the sacrifice (in terms of money, time and effort) is not a legitimate consideration in any SFAIRP argument, although the costs themselves are. In the rail industry, we have traditionally considered the implications of major decisions on SFAIRP issues on the industry's funding, usually in consultation with the DfT. Affordability is therefore a “public interest factor” in terms of our health and safety Enforcement Policy Statement – see: <http://www.rail-reg.gov.uk/upload/pdf/281.pdf>.
- **Gross disproportion:** This is a judgment to be made by the duty holder in each case and, if challenged, to be ultimately decided by the courts. For a measure not to be “reasonably practicable”, the degree of disproportion between sacrifice (in terms of money, time and effort) and benefits must be ‘gross’. The concept of gross disproportion derives from the Edwards case - see paragraph 6. The case law does not prescribe any factor or algorithm for what constitutes ‘grossness’.

#### **Individual, collective, societal concern and societal risk:**

- **Individual risk:** An evaluation of individual risk should be made in terms of a model person – an individual who is in some defined, fixed relationship to the hazard and represents an appropriate model of risk exposure. This may be somebody most exposed to the hazard, for example the regular commuter or train driver, or a person with an assumed pattern of life. The duty holder will have to examine a number of models to ensure that all the population exposed to significant risk is addressed. It is important to construct the correct model(s), so that the risk from just a few journeys is not averaged over

a year. This is particularly important with, say, a charter operator only running a few journeys per year.

- **Collective risk:** Collective risk is the total risk over the exposed population and is used to compare the sacrifice (in terms of money, time and effort) with benefits. It is essentially the sum of each exposed person's individual risk. The safety benefits are usually calculated as the reduction in the level of collective risk multiplied by the value of the harm prevented (or the Value of Preventing a Fatality) - see additional guidance: "*Internal guidance on Cost Benefit Analysis (CBA) in support of SFAIRP decisions*".
- **Societal concern and societal risk:** Societal concerns can arise after a serious incident because the dread it generates can result in a large cost to the nation and the industry in terms of loss of public and political confidence. However, duty holders need only take into account the societal risk (associated with multi-fatality incidents) element of societal concern, which they can do by identifying possible multiple fatality events and weighting them accordingly when deciding if risks are being reduced SFAIRP. This is of particular relevance where there is the potential to harm large numbers of people in a single event.

ORR does not usually expect duty holders to provide a quantitative assessment of societal risk. Instead societal risk should be qualitatively assessed (i.e. those events with the potential to give rise to multiple fatalities should be identified and rigorously examined to demonstrate that the controls currently in place are sufficient, given the potential number of fatalities and the frequency of such events) and taken into account when the issue of gross disproportion is decided. However, HMRI would expect a quantitative assessment of societal risk where a significant hazard is novel, as was the case, for example, when the Channel Tunnel was designed and built.

- **Transfer of risk:** If a control measure results in a transfer of risk from the same hazard to other people, then the additional risk to those people should be offset against the benefits the measure provides. For example, changes made to a diesel engine to move fumes away from the driver may put passengers at increased risk. Where the transfer of risk results in exposure to a new or different hazard, the risk from that hazard should be considered as a separate issue, to be reduced SFAIRP, and not offset against the original risk.
- **Removal of existing control measures:** Removal of control measures should be exceptional and may only be acceptable where:
  - the circumstances have clearly changed, for example from changes in technology (e.g. the introduction of TPWS and track warning systems); or
  - there are changes in understanding (e.g. reduction of uncertainty in the risk assessment process); or

- the sacrifice (in terms of money, time and effort) of a measure can be shown to be clearly grossly disproportionate to the benefit it provides and the reduction in risk is negligible.

In these circumstances, the level of risk must still be reduced SFAIRP. It is not generally permissible for duty holders to rely only on a CBA to justify removing existing established control measures (e.g. one embodied in industry good practice). Where the analysis appears to show that the measure achieves a reduction in the risk at a grossly disproportionate sacrifice (in terms of money, time and effort), then judgement must be exercised before a decision is taken to remove existing controls. The established nature of a control measure may be indicative of its reasonable practicability, contrary to the findings of an assessment based on CBA alone.

- **Selecting control measures:** When a number of options for risk reduction exist, the measure (or combination of measures) that could reduce risk to the greatest extent and that is reasonably practicable is the one that should be implemented, not the cheapest option. Significant differences in time needed to implement various measures could be a legitimate factor for consideration in any decision. That is, if a cheaper option (but one that does not provide the greatest risk reduction) can be implemented in a significantly shorter time than the best option (one that produces the largest reduction in risk, but is the more expensive option), it may then be acceptable to implement the cheaper option. The starting point must either be the current situation or, for a new build, that option which conforms to current good practice. For further guidance see: *“Internal guidance on Cost Benefit Analysis (CBA) in support of SFAIRP decisions”*.
- **New versus existing operations:** It may not be reasonably practicable to apply an enhanced control measure retrospectively to an existing operation. This may be the case even if the enhanced measure had become, in effect, good practice for all subsequent new operations. Whether the measure should be applied will depend on the specific circumstances of the existing operation, the risk levels, and whether the sacrifice (in terms of money, time and effort) to retrofit the measure is grossly disproportionate. For example, the raising of existing low platforms to today’s standards is generally grossly disproportionate to the risk. However, if a platform is reconstructed to some extent (even just resurfaced), it may be reasonably practicable to raise it to the current standard height.
- **Cost benefit analysis (CBA):** CBA cannot form the sole argument in showing that risks are reduced SFAIRP. CBA is not an end in itself, but rather an aid to decision making. If a proposed particular measure ‘fails’ a CBA, in that the sacrifice (in terms of money, time and effort) is greater than the benefits, this does not mean that it is not reasonably practicable to implement; gross disproportion must also be considered - see additional guidance: *“Internal guidance on Cost Benefit Analysis (CBA) in support of SFAIRP decisions”*.

## **ACTION FOR ORR STAFF - Judging whether the level of risk is reduced SFAIRP**

12. Where railway-specific legislation imposes a SFAIRP duty then, as for HSWA, the onus is on duty holders to demonstrate that controls are in place to reduce the level of risk SFAIRP. Our role is to assess the evidence provided in, for example, an application for a safety certification or authorisation and/or to test through inspection that duty holders are complying with their legal obligations. Under the ROGS safety permissioning regime, duty holders do not have to send us their risk assessments. They only need satisfy ORR that their procedures for carrying out risk assessments and selecting and implementing control measures are capable of reducing risks SFAIRP. Inspection is the principal means by which ORR ensures that specific risks are managed and seeks evidence that they are reduced SFAIRP.

13. For day-to-day hazards, compliance with good practice is generally sufficient (see the bullet on “Good Practice” under paragraph 11) in SFAIRP terms. However, there are occasions where there may be no relevant defined good practice, or where the practice appears insufficient to control risk. For multi-fatality hazards, for which there is likely to be societal risk, the duty holder needs to be able to provide evidence, if challenged, that the good practice in this situation meets the SFAIRP test. This may require them to review the adequacy of existing controls, and identify and give consideration to additional risk control measures.

14. ORR will generally expect a duty holder’s evidence that risks are controlled SFAIRP to include:

- **A proportionate risk assessment:** Risk assessment underpins the whole SFAIRP argument and it is therefore extremely important that this is suitable, sufficient and proportionate to the level of risk. Risk assessments may range from a qualitative comparison between the risk control measures applied and accepted good practice, using simple risk-ranking matrices, through semi-quantitative techniques to full-blown Quantified Risk Assessment. The technique used should be determined by the magnitude of the risk, the degree of societal risk and the novelty of the hazard.
- **What else can be done:** The evaluation of risks should include sufficient evidence that potential additional control measures have been identified, including those not ultimately implemented. The level of detail should be proportionate to the level of risk, thereby providing us with assurance that the duty holder is seriously committed to risk reduction. Evidence should be sought of a structured process of evaluating possible options, undertaken by a range of competent persons and senior managers.
- **Why is this not being done:** The duty holder should demonstrate why rejected control measures identified in the risk evaluation process could not be implemented. A full-blown CBA will generally not be expected nor, in any case, would a CBA alone be sufficient. Usually qualitative engineering and / or operational arguments should be sufficient, with the amount of detail required being proportional to the level of risk.

15. ORR will also expect that:

- The level of both individual and societal risk created by the operation are taken into account - in a proportionate way; and
- The decision-making process and criteria adopted by duty holders are such that action taken is appropriately precautionary. That is, when the degree of uncertainty is large or the consequences of the realistic worst-case scenario could give rise to significant societal risk, greater weighting should be given to the consequences of failures, rather than considerations about their uncertainty, in the estimate of the likelihood of them occurring. This is particularly relevant for rare events where there is large uncertainty in the estimate of the likelihood of them occurring.

16. In the interests of transparency and consistency, ORR's staff may need to ensure that duty holders have considered the risk to employees and others (e.g. other workers, passengers and members of the public) separately, as well as together and proportionately. For example, where different groups are exposed to a given hazard in different ways. However, the approach adopted for each should be identical and should consider:

- the duty holder's specific circumstances and decide whether there is relevant good practice that would reduce the level of risk SFAIRP. If so, implementing good practice and the specific requirements of any applicable regulations will suffice.
- all risk reduction options and implement all those that are reasonably practicable. Determination that the sacrifice (in terms of money, time and effort) of implementation is grossly disproportionate to the risk must be balanced and consider both individual risk and societal risk.

17. If the duty holder cannot identify from a thorough and systematic examination further reasonably practicable risk control measures and, following this, we also cannot identify further reasonably practicable risk control measures beyond those implemented by the duty holders, then the level of risk should be considered reduced SFAIRP. However, we must ensure that duty holders continuously review their control measures and ascertain whether these remain sufficient to meet the SFAIRP test, since what is reasonably practicable can change as technology, management practices develop and risks change.

### **Technical Specifications for Interoperability (TSIs) and SFAIRP**

18. In the case of Interoperability, compliance with a Technical Specification for Interoperability (TSI), in respect of a subsystem to which it relates, is a legal requirement under European law as implemented in the United Kingdom. Such legal requirements take precedence over the legal requirements contained in UK domestic legislation.

19. In practice, this means that 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. Where implementation of a TSI might result in a reduction in the overall level of safety, duty holders should consider alternative reasonably practicable means of dealing with any increase in risk relating to the system as a whole, but without compromising or otherwise affecting the obligation to comply with the TSI in question.

## References

Ref. 1 Reducing Risks Protecting People – HSE’s decision-making process. HSE 12/01. ISBN 0 7176 2151 0, referred to as R2P2.

Ref. 2 Principles and guidelines to assist HSE in its judgments that duty-holders have reduced risk so far as is reasonably practicable. HSE, [www.hse.gov.uk/risk/theory/alarp1.htm](http://www.hse.gov.uk/risk/theory/alarp1.htm), December 13 2001, referred to as P&G.

Ref. 3 Assessing compliance with the law in individual cases and the use of good practice. HSE, [www.hse.gov.uk/risk/theory/alarp2.htm](http://www.hse.gov.uk/risk/theory/alarp2.htm), 13 December 2001.

Ref. 4 Policy and Guidance on reducing risks as low as reasonably practicable in Design. HSE, [www.hse.gov.uk/risk/theory/alarp3.htm](http://www.hse.gov.uk/risk/theory/alarp3.htm), 13 December 2001.

Ref. 5 The Ladbroke Grove Rail Inquiry, Rt. Hon. Lord Cullen PC, HSE 9/01, ISBN 0 7176 2107 3.