

A REVIEW OF, AND COMMENTARY ON, THE LEGAL  
REQUIREMENT TO EXERCISE A DUTY

**‘SO FAR AS IS REASONABLY PRACTICABLE’**

with specific regard to designers in the  
construction industry.

**Institution of Civil Engineers**

January 2010

## EXECUTIVE SUMMARY

The requirement to exercise a legal duty 'so far as is reasonably practicable' (SFARP) is at the heart of the construction industry design process. Whilst the requirement is well established in UK law, the expression is less well defined.

This note provides the background to SFARP and highlights certain issues of concern to Designers in relation to its implementation. It does not consider civil law.

As noted by the Government in their response to the House of Lords' report on the management of risk –

*'Government acknowledges that while there is much good experience and practice around in the use of these decision-making frameworks (e.g. SFARP), there is still room for improvement in increasing their acceptability to industry by better explanation and communication of their meaning and practical application'*

*'A key element of this is a communications strategy based around a set of guiding principles and focussed messages aimed at empowering risk managers to concentrate on what really matters and to know when 'enough is enough'..*

In many ways this encapsulates the rationale for this ICE report.

Advice from HSE provides the starting point in the absence of prescriptive Regulations or detailed case law: in this respect, where accepted 'good practice' exists, Designers have some guidance to follow in the discharge of their obligations. Where neither prescription, relevant case law nor HSE guidance exists there is greater uncertainty and greater clarity must be welcomed.

It is of great concern that Designers may become either unduly risk averse, or ignore risk management altogether, if they are uncertain as to the correct procedures or the sufficiency of their actions.

This note has been prepared to generate industry discussion amongst construction industry organisations, and the HSE, so that a pragmatic consensus may be reached as to a compliant route through the design process. It does not claim to have identified all the answers and the ultimate authority of the courts is acknowledged. The authors consequently cannot accept responsibility for the legal accuracy of the comments in this report, however, hope it forms a constructive contribution towards the 'better regulation' initiative.

The authors believe that these concerns should be resolved through a collective approach.

Note: the title of this report reflects common use of the phrase 'so far as is reasonably practicable'. The strict legal application is described in paragraph 2.4

#### **Issue Record**

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## GLOSSARY

<b>ACoP</b>	Approved Code of Practice
<b>ALARP</b>	As low as reasonably practicable
<b>CDM</b>	Construction (Design and Management) Regulations 2007
<b>COMAH</b>	Control of Major Accident Hazards Regulations 1999. For our purposes, and as noted in CDM: Client, Designer, Principal Contractor, Contractor and CDM-Coordinator
<b>Duty holder</b>	As noted in HSWA: Employers, employees, the self-employed and those in control of premises or the work activity
<b>GD</b>	Gross Disproportion
<b>HSWA</b>	Health and Safety at Work etc Act 1974
<b>HSC</b>	Health and Safety Commission (now combined with HSE)
<b>HSE</b>	Health and Safety Executive
<b>RSSB</b>	Rail Safety Standards Board
<b>SFARP</b>	So far as is reasonably practicable (sometimes alternatively abbreviated to SFAiRP)

# 1 INTRODUCTION

## Background

1.1 For some 35 years, under the requirements of the Health and Safety at Work etc Act 1974 (HSWA), and subsequent subordinate legislation (relevant statutory provisions), duty holders have had the statutory obligation to reduce risk within the scope of their undertaking, subject to the qualification to do things 'so far as is reasonably practicable' (often shortened to SFARP). Although other levels of obligation exist<sup>1</sup>, this is the most common requirement affecting designers and is an important obligation. Duty holders include employers, employees, the self-employed and those in control of premises or the work activity.

1.2 The concept of SFARP pre-dated HSWA however it arises specifically as an aspect of the 'goal setting' approach embedded within the current health and safety related legislation. This legislative framework itself stems from the seminal 'Robens Report' 1972 [1]. It, and goal setting, contrasts with the previous and alternative 'prescriptive' approach to health and safety risk management which has been largely phased out over the same period.

1.3 The essence of the approach set out in HSWA is that the duty holder<sup>2</sup> is required to ensure the health, safety and welfare of those affected by his undertaking subject to the qualification of SFARP. This has to be done by considering the specific circumstances identifying and eliminating hazards, and then, if this is not possible (so far as is reasonably practicable) by reducing the risks from any remaining hazards; again 'so far as is reasonably practicable'.

1.4 The principle and use of SFARP, and the more stringent 'so far as practicable', have recently been challenged by the European Commission as being inconsistent with the EU Framework Directive. However the European Court ruled in the UK's favour [2] and the approach consequently remains the same.

## Definition of SFARP

1.5 The question inevitably arises, what does SFARP mean? How does a duty holder know when the requirement has been satisfied? The answers to these questions are not generally provided by the legislation or by the enforcing agency (HSE in the case of most construction work) other than in general terms. As is the practice under UK law<sup>3</sup>, case law has assisted with the interpretation of the Act. On this basis it is generally understood that SFARP means that efforts should continue to be made to eliminate hazards or

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<sup>1</sup> i.e. strict liability which means that if the outcome occurs there will be no defence to a prosecution, and 'so far as is practicable'.

<sup>2</sup> Generally the person creating or controlling the risk. see glossary.

<sup>3</sup> Strictly, Northern Ireland is governed by separate legislation, the 'Health and Safety at Work Order 1978' but the issues are the same.

reduce risks until the effort (i.e. the implementation of safety measures) expended is grossly disproportionate<sup>4</sup> to the risk or benefit gained. This takes us some way forward but still leaves a question mark over quite what the Court/Jury would consider to be 'grossly disproportionate' and hence the limit of required endeavours.

1.6 Although some industries e.g. nuclear, work on a quantified risk assessment basis for design, where accepted limits of probability or cost multiples are established in respect of 'gross disproportion', that is rarely possible in construction design work as the requisite data are not available and there are too many variables. Hence, for this and other reasons, this note is concerned with the interpretation of SFARP on a qualitative basis, and as applied to 'detailed risk management' rather than 'strategic risk management'<sup>5</sup>.

### **Implementation**

1.7 Notwithstanding any uncertainty, contractors (as employers) in the construction industry have worked with this definition of SFARP for many years and, whilst its implementation varies across the spectrum of organisations<sup>6</sup>, there is much practical workplace advice, good practice benchmarks and other pointers to what are assumed, by those using it, to be acceptable solutions<sup>7</sup>. Contractors are also the party in control of the work on site- it is their organisation that is planning, controlling and/or executing the work activity. It is this aspect which, as a rule, differentiates their position from that of many Designers, and why, at this stage the study concentrates on the latter.

1.8 Traditionally (but erroneously) within the construction industry the responsibility to eliminate hazards and reduce risks was commonly considered by many to be the sole province of contractors (either building or maintaining) as part of the process of achieving safe systems of work. In fact others always had responsibilities (under s3 of HSWA and Regulation 3 of the Management of Health and Safety at Work Regulations), but it was only in 1995, when the CDM Regulations 1994 came into force, that the spotlight swung onto construction industry designers who were given explicit duties in support of s3 of HSWA. Subsequent case law has reinforced obligations under s3 [3].

1.9 The recently revised CDM Regulations 2007 have reworded the CDM1994 obligations falling on designers to (Regulation 11 (4)):

*'eliminate hazards which may give rise to risks'* (SFARP) ; and then

*'reduce risks from any remaining hazards'* (SFARP)

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<sup>4</sup> Explained in Appendix A

<sup>5</sup> e.g. consideration of whether a facility should be built at all.

<sup>6</sup> The substantial majority of which are SMEs.

<sup>7</sup> Whether these satisfy the 'SFARP' test is another question altogether which is not considered in this report

*'taking due account of other relevant design considerations'*

In accordance with Regulation 11(3) these obligations relate only to 'foreseeable risks'. In addition, in implementing this regulation, the Designer is obliged to follow the order of priorities set out in Schedule 1<sup>8</sup> of the Management of Health and Safety at Work Regulations 1999.

1.9 Despite the apparent simplicity of this statement, its practical application, within the framework of SFARP, remains uncertain within the design community. How do Designers determine the point at which any actions taken have reached the point of 'gross disproportion to the benefit'? How does this square with 'best, good or accepted practice'? What happens when there is no obvious 'measure' against which to judge the action taken? How is 'due account of other relevant design considerations' factored in? How do contractual boundaries affect the discharge of this obligation?

1.10 It is considered important that Designers become neither risk averse, nor ignore risk, as a consequence of any uncertainty.

### **Purpose of Note**

1.11 This note has been produced by an ICE Panel (Appendix F) in order to summarise the position in respect of SFARP from a Designer's perspective. It is not intended to argue for or against the use or logic of the current framework of health and safety legislation or the use of its associated procedures (e.g. reverse burden of proof- paragraph 2.10), amongst which is SFARP (although it does raise concerns). However, it is intended to start a debate with its ultimate aim to bring clarity to the practical application of SFARP and to highlight aspects which remain uncertain within a design environment. The Panel anticipates such clarification will allow the production of 'case studies' which are considered by many to be the best means of illustrating the standard to be achieved.

As background information, **Section 2** outlines the legal basis of SFARP, and summarises associated guidance; it briefly comments on contract, and concludes with a commentary. **Section 3** considers how these obligations might be related to the design process and highlights the queries that arise as a consequence. A summary is given in **Section 4**. The **Appendices** provide additional information.

1.12 The note is written to engender debate and discussion rather than act as a design guide. In due course it is hoped to derive a shortened version which could be made available to Designers as an aide mémoire. The note incorporates a number of outputs from discussions held with HSE.

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<sup>8</sup> This sets out a hierarchy of actions, commencing with the obligation to 'eliminate' (SFARP).

## 2 LEGAL SUMMARY, GUIDANCE AND COMMENTARY

### Summary of legal position

2.1 The commonly accepted legal definition of SFARP stems from a civil law case which preceded HSWA by some 25 years (Appendix A). Case law is the most authoritative source available. The judgement of the Court of Appeal in the *Edwards v National Coal Board* case (generally held to be the leading authority) was that:

- Action had to be taken to reduce the risk up until the point at which the effort (allowing for time, trouble and expense) became grossly disproportionate to the risk,
- The effort could be proportionate to the degree of risk <sup>9</sup>

2.2 The key issue here is that, from paragraph 2.1, action has to be taken until the point of 'gross disproportion' (GD) is reached. This is illustrated graphically in Figures 1 and 1a below.

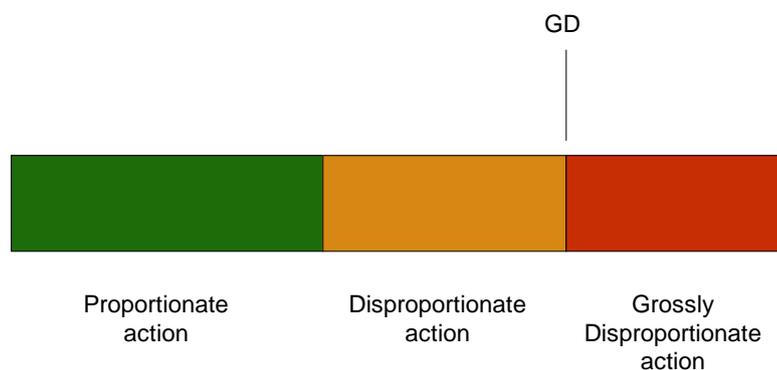
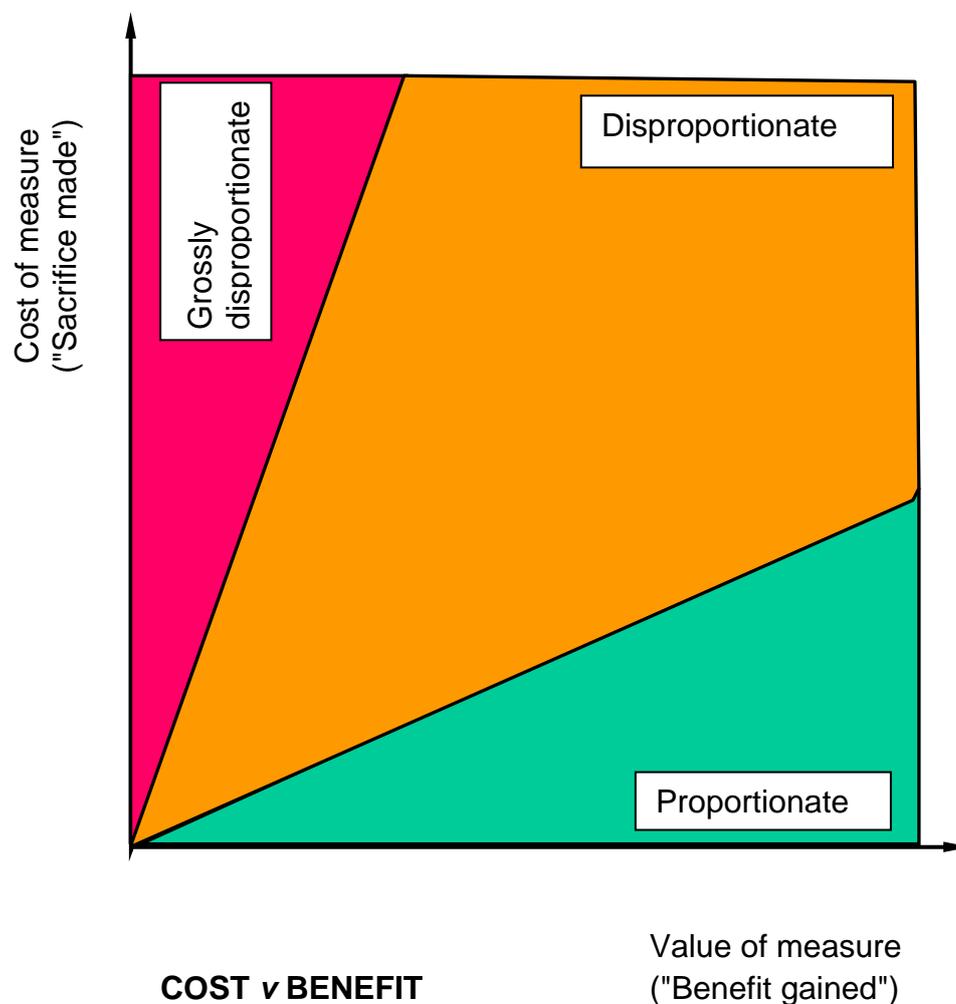


Figure 1: proportionate through to grossly disproportionate action

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<sup>9</sup> This definition is reflected in the ACoP to the Control of Substances Hazardous to Health Regulations (paragraph 34).

This progression may also be illustrated as follows:



**Figure 1A: progression from proportionate action through to disproportionate action**

2.3 These figures clearly show the progression from 'proportionate action', to 'disproportionate action', to the point of 'gross disproportion' (GD).

2.4 However, a later case (Marshall v Gotham (Appendix A)), used the language of 'proportion' and 'disproportion' implying that measures are required up to a point of 'disproportion', but perhaps not up to 'gross disproportion'.

2.5 There is no additional substantive guidance from case law as to the extent of the required measures or what these terms mean in practice. In terms of engineering practice, this requires a quantification of the gradient of the two lines in Figure 1A. One study of case law [4] found that:

*Given that the balancing is being done intuitively and qualitatively, the difference may not be all that significant. (i.e. between gross disproportion and a nominal excess of benefit in the cost-benefit equation).*

2.6 A further key aspect to this approach is that in using the GD test account has to be taken of technological progress<sup>10</sup>. Hence, what was once considered an acceptable solution may not be so today or in the future.

2.7 It is worth noting that the duty to ensure the safety of others has been clarified by the Court of Appeal which indicated that SFARP is not a defence, but a qualification of the underlying duty related to 'foreseeable' risk<sup>11</sup>. The House of Lords has also recently commented 'These duties are not, of course, absolute. They are qualified by the words "so far [as] is reasonably practicable". If that result is not achieved the employer will be in breach of his statutory duty, unless he can show that it was not reasonably practicable for him to do more than was done to satisfy it'[ 5]. In a separate case, the Court of Appeal stated that risk must not be 'fanciful or hypothetical'. [6]

2.8 The following extract from the judge's summing up in the 'Port Ramsgate' walkway collapse trial [7] stated:

*"...if thought had been given to its responsibilities especially having regard to the provision of the [HSWA], Port Ramsgate could have appreciated that there were potential risks, albeit, perhaps very small risks...Further, once it was appreciated that there were potential risks, it would have been appreciated that such risks should have been guarded against because of the catastrophic consequences if anything went wrong". (R v Fartygsentreprenader AB, Fartygskonstructioner AB, Port Ramsgate Ltd and Lloyds Register of Shipping, unreported 28 February 1997)*

Although this is a first instance decision, it appears to support the view that some action is required by designers to think about the risks and to take side steps to guard against them. Although it relates to a HSWA s3 duty (i.e. a duty towards those not in the duty holder's employment), a comparison may be drawn with the situation of the Designer, as an employer under HSWA.

2.9 Whether a Designer's obligation has been discharged in a particular circumstance under 11(4) CDM2007, will depend upon whether the risk was foreseeable and whether it was dealt with SFARP taking due account of other relevant design considerations.

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<sup>10</sup> Management of health and safety at work Regulations 1999 Schedule 1.

<sup>11</sup> The principle of 'foreseeability' is not an issue here as CDM2007 is specific; however the wider application has recently been clarified in R v HTM (Reference 8).

2.10 A particular feature of HSWA is that, in the situation of a prosecution, once HSE has demonstrated there is a case to answer (or in other words the existence of a risk), the burden of proof lies with the defendant i.e. it is for defendant to demonstrate that something has been done 'SFARP'. This is referred to as the 'reverse burden of proof' (HSWA s40). In these circumstances the requisite standard of proof is determined 'on the balance of probabilities', rather than by the standard normally associated with criminal cases of 'beyond all reasonable doubt'. Although some are concerned at the implications of the reverse burden of proof approach, this particular aspect of the law is not examined in this note.

2.11 The Commission of the European Union instigated an action against the UK government in respect of its use of SFARP and its alleged incompatibility with the EU Framework Directive. Others have also put forward lengthy arguments supporting this alleged incompatibility [9]. However, the EU Advocate General issued an Opinion in January 2007 [10] in support of the UK and this was affirmed by the EU Court of Justice in June 2007 [2]. Given the outcome, and the fact that the case did not rest on the determination of the meaning of SFARP (rather the consequence of its use to an established overall definition) the EU case is not considered further in this note.

### **Guidance**

2.12 HSE agrees that 'there is little guidance from the courts as to what reducing risks SFARP means' [11]. To quote another commentator:

*Whatever views may be taken of the SFARP clause and the framework directive's provisions, the plain fact is that the clause is anything but straightforward; it does not spell out what makes something 'reasonably practicable' [12]*

2.13 HSE has extensive advice on the general topic of 'risk' and 'ALARP'<sup>12</sup> on their website [13]. To all intents and purposes (and from the perspective of this note) ALARP has the same inference as SFARP [ref 15-ALARP at a glance]; however regulations make use of both terms.

2.14 The key points arising from this guidance (which does not reflect recent case law) are:

- Although the guidance is not industry specific, it is clearly written from a 'process industry' and/or 'major plant' perspective. The language and approach does not easily fit the construction design process.
- It has a strong bias towards strategic and quantified risk assessment.

2.15 Nonetheless the HSE guidance gives some useful pointers in respect of providing insight to the practical definition of 'gross disproportion' for qualitative assessment e.g.

- Compliance with 'good practice' is an acceptable measure of SFARP

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<sup>12</sup> As Low As Reasonably Practicable

- HSE and duty holders are expected to keep ‘good practice’ under review
- Action must always be to the point of ‘gross disproportion’ [14].

2.16 However, the HSE guidance goes on to say:

- ‘Good practice’ is defined by HSE as “those standards for controlling risk that HSE has judged and recognised as satisfying the law, when applied to a particular relevant case, in an appropriate manner” [15].
- A universal practice within the industry is not necessarily ‘good practice’ [16].

2.17 The source of ‘good practice’ can be the HSE itself, National Standards Bodies (i.e. BSI), Trade and Industry organisations (e.g. CIRIA, IStructE, ICE, RIBA, SCI, BCSA, BCA) [17]. HSE indicates that unwritten ‘good practice’ may also be acceptable providing it satisfies ‘necessary conditions’ (See Appendix B).

2.18 Whereas it might be achievable for HSE to write or determine the status of strategic guidance relating to major works (such as those covered by ‘COMAH’)<sup>13</sup>, it would appear far too onerous a task for HSE to undertake a review for construction as a whole unless there is an understanding that certain industry authorships automatically qualify, as suggested, but not automatically confirmed, in Appendix B and R2P2 (Appendix D). Hence there is uncertainty surrounding the status of most construction guidance.

2.19 Formal guidance for construction is given in the Approved Code of Practice (ACoP) to CDM2007 [18]. However, this does not answer the questions we are posing other than confirming that:

- The effort devoted to planning and managing health and safety should be in proportion to the risks and complexity associated with the project (Introduction para 4)
- Designers need to take ‘reasoned professional decisions’ (para 124)
- Designers are required to avoid foreseeable risks<sup>14</sup> so far as is reasonably practicable taking due account of other relevant design considerations. The greater the risk, the greater the weight that must be given to eliminating or reducing it. (para 125)

2.20 The ACoP provides guidance to the law; compliance with the ACoP will normally be taken as sufficient to meet the legal requirements. The ACoP mentions ‘proportionate steps’ rather than ‘disproportionate steps’ in achieving the objective`. However, the means by which ‘other relevant design considerations’ are identified and weighed as part of the overall process is unclear as is the relationship of ‘reasoned professional decisions’ (see below) with a requirement to take a step unless it is ‘grossly disproportionate’ to the risk to do so.

<sup>13</sup> i.e. those falling within the ambit of the COMAH regulations.

<sup>14</sup> This wording, from the ACoP, does not match the wording of the Regulation itself which talks of ‘elimination of hazards’

2.21 It is noted that the ACoP mentions 'reasoned professional decisions' in the context of satisfying the SFARP requirement (para 124 of the ACoP). It appears however that the two approaches i.e. 'gross disproportion' and 'reasoned professional decisions' may be in conflict in respect of the end result.

2.22 HSE enforcement policy [19] is framed in terms of 'grossly disproportionate' action i.e. it supports the established position. However, it states that compliance is demonstrated via 'good practice' or from first principles and also discusses 'proportionality' in terms of any regulatory action i.e.:

*10 HSE believes in firm but fair enforcement of health and safety law. This should be informed by the principles of proportionality in applying the law and securing compliance; consistency of approach (continues)*

*11 Proportionality means relating enforcement action to the risks. (continues)*

2.23 An HSC (CONIAC<sup>15</sup>) sponsored Working Group has published a suite of guidance documents relating to CDM2007 [20]. The approved<sup>16</sup> guidance document relating to Designers reiterates the established position whereby a step should be taken, even if disproportionate, up to the point at which it becomes grossly disproportionate. (para 1.6.6). However, the guidance goes on to say that as the ACoP only mentions 'proportionate steps' it is reasonable to conclude that this is what is required.

2.24 The HSE document 'Reducing Risks, Protecting People' [21] provides some additional insight into HSE's decision making process, but does not add substantially to the points already made, although it does emphasise the role of 'authoritative good practice' in the decision making process. A commentary and selected extracts are contained in Appendix D.

### **Commentary**

2.25 HSE has been running a 'sensible approach to risk management' campaign in response to the adverse reporting and inappropriate actions of some individuals and organisations [22]. This is welcomed and could be a pointer towards Designers taking similar proportionate actions in the achievement of 'SFARP'. However there is nothing included in this programme which gives a tangible guide to SFARP in this context and the example risk assessments generally relate to HSWA s2 obligations.

2.26 The latest report on HSE's progress (Second Simplification Plan November 2007) states in paragraph 126:

*HSE successfully defended (against the EU- see paragraph 2.11) one of the key elements of British health and safety law - the use of the key phrase "so*

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<sup>15</sup> CONstruction Industry Advisory Committee

<sup>16</sup> In the sense that it originates from a HSC committee, has been reviewed by HSE, and bears its logo.

*far as is reasonably practicable” which helps to ensure that what is required of dutyholders is proportionate to the risks. The European Commission had claimed that UK health and safety legislation did .....*

Note that HSE talks in terms of ‘action proportionate to risk’.

Government has also established the ‘Risk and Regulation Advisory Council (RRAC)’, which has been supported by HSE.

2.27 The House of Lords considered the issue of ‘risk’ in a recent report (see Appendix C). It expressed concerns over the uncertainty associated with, amongst other things, SFARP. However the Government’s response (also included in Appendix C), whilst recognising that ‘GD’ is ‘well respected and has stood the test of time’, talked also of a need ‘to promote sensible and proportionate risk management’ stating in particular:

*‘Government acknowledges that while there is much good experience and practice around in the use of these decision-making frameworks, there is still room for improvement in increasing their acceptability to industry by better explanation and communication of their meaning and practical application’ (para 19).*

*‘A key element of this is a communications strategy based around a set of guiding principles and focussed messages aimed at empowering risk managers to concentrate on what really matters and to know when ‘enough is enough’.’ (para 19).*

2.28 Most of the informative commentary on the meaning of SFARP (e.g. papers, journals) concentrates on HSWA s2 obligations and their discharge i.e. to employees. Although the obligation is largely the same for s3 (i.e. the obligation to others), the practical issues of having regard to those ‘not in your employment’ can lead to additional complications, and particularly so in the construction industry due to the manner of procurement.

2.29 The Rail Standards Safety Board (RSSB) has been considering this matter [23]; they too have concerns over implementation and clarity of definition of SFARP. RSSB has suggested that the case law supports an interpretation that what is required is proportionate action ‘with additional measures erring on the side of caution to account for the uncertainty inherent in estimating the safety benefit. Therefore, if the safety benefit can be estimated with confidence, the test becomes closer to a test of disproportion’ [24]. RSSB stresses that this is only its own view.

2.30 Appendix E illustrates an example of where no accepted national guidance or practice exists. The HSE ALARP website guidance suggests in such cases that ‘common sense and professional judgement’ will often suffice (Appendix B: Item 2- deciding on ‘first principles’- second quoted paragraph), but goes on to say that:

*... the improvements may be relatively simple or cheap to implement and the risk reduction significant: here the existing situation is unlikely to be ALARP and the improvement is required.'*

Thus, noting the italicised text, in the case illustrated in Appendix E, action would be required by the Designer. This principle has significant implications and illustrates:

- i) why clarification is required.
- ii) the added complication when the duty holder (designer) is not the party responsible for the work itself nor for its direct control.

2.31 The Institution of Civil Engineers has released a statement entitled 'Design Risk Assessments and CDM 2007 – ICE View' which, whilst supporting the concept of eliminating hazards and reducing risks, suggests that the process should be achieved using 'engineering judgement'.

### **Obligations under civil law**

2.32 This note is concerned with the criminal law i.e. the Health and Safety at Work etc Act and the relevant statutory provisions. Civil law obligations such as in negligence are not considered further. There is though a brief mention of the impact of the contract framework on the knowledge the designer has on the way in which work will be carried out.

### **Contract and procurement**

2.33 Statutory obligations generally take precedence over the terms of a contract. However, the nature of the contract can influence the manner in which statute is discharged and has certainly established and influenced 'custom and practice' within the industry although that cannot necessarily be said to equate to good or best practice.

2.34 Designers may be employed by the organisation implementing the work e.g. a sub-contractor, or they may be employed by those with no contractual link with those undertaking the work e.g. as a consultant. In the former case the design can be moulded to fit the precise requirements of those charged with deriving a safe system of work. However, in the latter case the designer does not always have this direct link or knowledge; action taken (apart from obvious hazard 'elimination') is usually via a reasoned professional judgement - but often without the input of those actually charged with execution of the work itself. There is a strong argument therefore for improved integrated design, whereby advice from 'constructors' is available at the design stage (see also paragraph 2.28). However, until that occurs, difficulties remain and 'contract' remains a significant issue.

## Summary

2.35 Taking account of the law, guidance and commentary available to Designers, and recognising the hierarchy of authority, one can summarise as shown in Table 1 following.

Element	Extracts: Obligation/Guidance
1 Statute - HSWA <sup>17</sup>	For s3, duty is in relation to risks arising from one's undertaking and affecting others. Obligation is to do something 'SFARP'
1a Statute - CDM	Duty is in respect of foreseeable risks affecting others. Obligation is to do something 'SFARP' taking account of other relevant design considerations
2 Case Law	Measures implemented until they are 'disproportionate', maybe up to point of 'grossly disproportionate' to benefit taking account of 'money, time or trouble', reflecting seriousness of risk Risks should be foreseeable. Consideration of 'fanciful' risks may be excluded.
3 CDM Approved Code of Practice	Effort should be proportionate to risk. Proportionate steps to be taken. Reasoned professional judgements are acceptable.
4 HSE Guidance on ALARP	Text is written to suit the manufacturing/process industry rather than construction industry design. Recognition that there is a dearth of authoritative guidance on ALARP. The ALARP process can be difficult. Compliance with 'good practice' is sufficient. Universal practice is not necessarily 'good practice'. Good practice can be represented by formal industry 'norms' providing these are approved by HSE. Standards will rise with technological progress. Action taken must reflect the 'gross disproportion test' <sup>18</sup> Guidance is directed more towards 'major' or 'strategic' risk.
5 HSE approved Industry Guidance for Designers	Associates guidance requirements with the 'proportionate' steps mentioned in the ACoP.
6 Reducing Risk, Protecting People	(those) controls, at a minimum, must achieve the standards of relevant good practice precautions, irrespective of specific risk estimates;
7 Commentary	Government response to Lords' report on risk management gives mixed messages, talking of both GD and proportionate action. Government acceptance of need for: <ul style="list-style-type: none"> <li>• better explanation and communication</li> <li>• ensuring risk managers<sup>19</sup> know when 'enough is enough'</li> </ul> HSE Simplification Plan talks of 'proportionate action'

**Table 1: Obligation and guidance**

<sup>17</sup> As from April 2008 the charge of corporate manslaughter (corporate homicide in Scotland) will be assessed, in part, against compliance with all health and safety legislation and guidance. This emphasises the need for clarity as to the necessary compliance measures.

<sup>18</sup> Reflected by 'good practice' providing this is approved by HSE

<sup>19</sup> Designers in this case

2.36 Table 1 presents a somewhat confused picture, but the key points are:

- i) Whereas there is agreement that 'proportionate action' is reasonable, and agreement that 'grossly disproportionate action' is unreasonable, there is confusion and a lack of definitive guidance as to whether 'disproportionate action' is required, and whether this should extend to the point of 'gross disproportion'<sup>20</sup>.
- ii) Available guidance sends out mixed messages as can be seen, for example, from Table 1, section 4 but 'proportionate' action is clearly emphasised in a number of places
- iii) Whereas the Government undertook to provide guidance to illustrate when 'enough was enough', none has yet appeared in a format to assist construction designers.

2.37 However, given the admitted difficulties, and the necessary qualitative approach, it is concluded that 'good practice' and 'proportionate action' is the basis on which Designers should proceed. The key to progress therefore is defining these terms. This is discussed in Section 3.

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<sup>20</sup> The point has been made to the authors that the phrase 'a requirement to carry out disproportionate action...' does not give the sense of reasonableness.

### 3 A DESIGN APPROACH

3.1 This section sets out a proposed approach to design which might be considered as meeting the requirements of SFARP. It is recognised that ultimately only the courts can decide; however, following wider, industry consultation, it is hoped that these suggestions will become accepted as 'good practice', approved by HSE, and thus create an established approach.

3.2 The majority of Designers may be more comfortable with almost prescriptive advice (as in other areas of design), so as to move ahead with their designs in a timely way and without recourse to research and debate, or leaving residual uncertainty as to whether the Designer has done enough. Hence, whilst supporting the concept of 'goal setting' embodied in the HSWA, the framework set out below aims to remove as much doubt and uncertainty as possible.

3.3 The process has been divided into four proposed categories:

<b>Proposed Category</b>	<b>Design which relates to:</b>	<b>Means by which SFARP can be achieved; Proposal and Comment</b>
1	Codes and formal standards	BSs and other formal standards are used where available and applicable <sup>21</sup> (having regard to their limitations, scope and assumptions).
2	Formal industry guides	The advice given in industry guides published by recognised organisations e.g. CIRIA, SCI, Concrete Centre, CWCT, BCSA, and the like, is followed where applicable.
3	Recognised good practice	Where established and approved national good practice is available, it is followed. This would apply not only to the 'thing' under design, but also to the process of design, as management and resourcing can both introduce risk.
4	Other	Individual instances not covered by 1-3 (See paragraph 3.8).

**Table 2: Assumptions for Design**

3.4 The approach given in Table 2 is qualified by the following:

- i) Departures from any of the standards, guidance and good practice mentioned above in Categories 1-3 is a matter for the Designer; if such departures impact upon the health or the

<sup>21</sup> Many BSI codes do not make explicit reference to occupational safety or health, nor cover all eventualities.

- safety of others, then it is for the Designer to ensure compliance with the 'SFARP' test (as Option 3 or 4).
- ii) Categories 1-3, and specifically 'good practice' (Category 3), need to be recognised by industry generally, and accepted by HSE, in order to qualify.
  - iii) Categories 1-4 should reflect a 'whole-life' approach where relevant (making reasonable assumptions regarding future use).

3.5 The consequence of the proposals in the above table is that certain guidance documents, if accepted by HSE, would attract quasi-legal status<sup>22</sup> i.e. following the guidance would not be legally required but would result in the knowledge that the design was compliant<sup>23,24</sup>. However, in the case of guidance being ignored, the Designer may have to demonstrate how 'SFARP' was achieved by alternative means - i.e. a Category 4 situation.

### **Industry guidance (Category 3)**

3.6 Hazard and risk can arise from more than the design of the 'thing'; for example it can arise from a failure to use competent persons and appropriate levels of supervision; risk management also requires appropriate checks and balances relating to the process of design.

3.7 The presumption is that Designers follow 'good practice' along with an explanation and justification for their actions. It is assumed that they are competent. Advice is needed to determine what constitutes acceptable 'good practice' in this respect.

### **Other (Category 4)**

3.8 Where no accepted approach to manage a risk exists, some other approach is required and guidance is required. An example of this category is illustrated in Appendix E. This is included to promote debate.

### **Evidence of compliance**

3.9 Although there is no specific requirement to record methodology, in consideration of s40 (reverse burden of proof- see paragraph 2.10) there may be merit in recording the methodology adopted for the significant elements of design e.g.

- The process itself
- Standards adopted i.e. categories 1-3, 4
- Options considered

Designers will need to weigh up the risk of being prosecuted against the effort of recording their approach. It may in any event be justified on quality and effective and efficient design basis.

A 'design log' (record of decisions and the reasons for them) has been found useful by some in this regard.

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<sup>22</sup> Similar to, but nonetheless different from ACoPs

<sup>23</sup> Subject always to the specifics of the actual situation.

<sup>24</sup> Having regard to technological progress

## 4 SUMMARY

4.1 This paper has demonstrated that there are a number of uncertainties relating to the way in which 'SFARP' should be interpreted and applied to design work so as to satisfy the law.

4.2 Designers may become either unduly risk averse, or ignore risk management altogether, if they are uncertain as to the correct procedures or the sufficiency of their actions. This should be a matter of real concern.

4.3 HSE has stated that it is unable to support, and hence be bound by the suggestions made in Section 3; however it has confirmed its willingness to work with industry to produce case studies and has indicated that it would be willing to endorse them if they are deemed acceptable.

4.4 As a result of discussions with HSE, in relation to this report, HSE has also confirmed that 'reasoned professional judgement' would be accepted as a way of satisfying SFARP

4.5 HSE has confirmed that it has no specific plans to review the meaning of 'other design considerations' within the framework of SFARP (paragraph 1.9), however, it will review the position on completion of the CDM Regulations review which is underway currently.

4.6 Notwithstanding the provision of case studies, there remains a need for clarification on the fundamentals of SFARP.

4.7 The authors suggest that consideration be given to obtaining Legal Opinion.

## APPENDIX A: LEGAL BACKGROUND

### Summary of legal position

A1 The commonly accepted legal definition of SFARP stems from a civil law case which preceded HSWA by some 25 years: *Edwards v National Coal Board* case [25]. In this case Asquith LJ (of the Court of Appeal) stated:

A2 *"... 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

A3 *"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."*

A4 Thus the key points here are that:

- measures (to reduce risk) are to be taken up until the point at which it becomes 'grossly disproportionate' to the benefit resulting; and
- account may be taken of cost, time and effort.

A5 A further case was heard by the House of Lords in 1954 (*Marshall v Gotham Co Ltd*) [26]. This included the statement (quoted by Government in their response to Reference 27):

'The test of what is reasonably practicable is not simply what is practicable as a matter of engineering, but depends on the consideration, in the light of the whole circumstances, at the time of the accident, whether the time, trouble and expense of the precautions suggested are or are not disproportionate to the risk involved, and also an assessment of the degree of security which the measures may be expected to afford'.

A6 In the same judgement, Lord Oaksey said: *"I agree with the Court of Appeal that it was not reasonably practicable to take such steps when slickenside had never occurred in the mine for the last twenty years. The position before the accident and the position after the accident are two quite different things. The question is not simply whether it was practicable as a matter of engineering, but whether it was reasonably practicable when no such thing as slickenside had occurred in the mine for at any rate twenty years, or even been heard of by many experienced miners although it is a known geological fault. I agree with the speech of Lord Atkin in Coltness Iron Co Ltd v Sharp, where he said ([1937] 3 All ER 593):*

*"In the facts of this case, where the dangerous machinery was exposed for only a few minutes, as the only means of effecting necessary repairs in a part of the mine where it was unlikely that any workman, other than the engineer engaged in the work of repair, would be exposed to risk of contact with the machine, I am unable to take the view that it was reasonably practicable by any means to avoid or prevent the breach of s. 55 [of the Coal Mines Act, 1911]. The time of non-protection is so short, and the time, trouble and expense of any other form of protection is so disproportionate, that I think the defence is proved."*

A7 From this the authors of this report conclude that , what is "reasonably practicable" depends on a consideration whether the time, trouble and expense of the precautions suggested are disproportionate to the risk involved."

A8 Thus this talks in terms of 'disproportionate' rather than 'grossly disproportionate' steps. However the 'GD' test appears in formal documents and is presented by most authorities as the required measure

A9 It should be noted that acceptance of 'proportionate' rather than 'grossly disproportionate' action as the test of compliance, would move the UK further away from the requirements of the EU Framework Directive Article 5 (4), which was the cause of the recent unsuccessful EU action against the UK.

## APPENDIX B

Extracts from three of the notes from the 'ALARP Suite of Guidance' section of the HSE website. Hence 'we' and 'us' in this appendix refers to HSE. Underlining has been added by the authors of this SFARP document.

This text appears to have been written from a manufacturing or process industry perspective and does not appear to have been updated to reflect subsequent changes in the law.

([www.hse.gov.uk/risk/theory/alarp.htm](http://www.hse.gov.uk/risk/theory/alarp.htm) accessed on 23.10.07)

### **1-Principles and guidelines to assist HSE in its judgements that duty-holders have reduced risk as low as reasonably practicable.**

*43. A universal practice in the industry may not necessarily be good practice or reduce risks ALARP. Duty holders should not assume that it is. HSE must keep its acceptance of good practice under review since it may cease to be relevant with the passage of time; new legislation may make it no longer acceptable; new technology may make a higher standard REASONABLY PRACTICABLE. Similarly HSE expects duty-holders to keep relevant good practice under review.*

*44. Probably the majority of judgements made by HSE involves it in comparing duty-holders' actual or proposed practice against RELEVANT GOOD PRACTICE. Relevant good practice provides duty-holders with generic advice for controlling the risk from a hazard. In so far as they can adopt relevant good practice, this relieves duty-holders of the need (but not the legal duty) to take explicit account of individual risk, costs, technical feasibility and the acceptability of residual risk, since these will also have been considered when the good practice was established.*

*45. In practice therefore, explicit evaluations of risk rarely need to be made in relation to day-to-day hazards. However, duty-holders have to make them where there is no relevant good practice establishing clearly what control measures are required.*

And,

### **2-ALARP at a glance**

#### **How we use ALARP**

*Using "reasonably practicable" allows us to set goals for duty-holders, rather than being prescriptive. This flexibility is a great advantage but it has its drawbacks, too. Deciding whether a risk is ALARP can be challenging*

*because it requires duty-holders and us to exercise judgement. In the great majority of cases, we can decide by referring to existing 'good practice'.*

### **Deciding on 'first principles'**

*Where the situation is complex, it may be difficult to reach a decision on the basis of good practice alone. There may also be some cases (for example, a new technology) where there is no relevant good practice. In such cases, good practice should be followed as far as it can be, and then consideration given to whether there is any more that can be done to reduce the risk. If there is more, the presumption is that duty-holders will implement these further measures but this needs to be confirmed by going back to first principles to compare the risk with the sacrifice involved in further reducing it.*

*Often such "first principles" comparisons can be done qualitatively, i.e. by applying common sense and/or exercising professional judgment. or experience. For example if the costs are clearly very high and the reduction in risk is only marginal, then it is likely that the situation is already ALARP and further improvements are not required. In other circumstances the improvements may be relatively simple or cheap to implement and the risk reduction significant: here the existing situation is unlikely to be ALARP and the improvement is required. In many of these cases a decision can be reached without further analysis.*

And,

### **Deciding by good practice**

*In most situations, deciding whether the risks are ALARP involves a comparison between the control measures a duty-holder has in place or is proposing and the measures we would normally expect to see in such circumstances i.e. relevant good practice. "Good practice" is defined in the general ALARP guidance as "those standards for controlling risk that HSE has judged and recognised as satisfying the law, when applied to a particular relevant case, in an appropriate manner." We decide by consensus what is good practice through a process of discussion with stakeholders, such as employers, trade associations, other Government departments, trade unions, health and safety professionals and suppliers.*

## **3-Assessing compliance with the law in individual cases and the use of good practice**

### **2.1 Good practice:**

*Within HSE and in this document, good practice is the generic term for those standards for controlling risk which have been judged and recognised by HSE as satisfying the law when applied to a particular relevant case in an appropriate manner.*

And,

1. *Other written sources which may be recognised include:*
  - *guidance produced by other government departments;*
  - *Standards produced by Standards-making organisations (e.g. BS, CEN, CENELEC, ISO, IEC);*
  - *guidance agreed by a body (e.g. trade federation, professional institution, sports governing body) representing an industrial/occupational sector.*
2. *Other, unwritten, sources of good practice may be recognised if they satisfy the necessary conditions e.g. the well- defined and established standard practice adopted by an industrial/occupational sector.*

### **Identifying good practice**

*3.9 In judging and recognising good practice, HSE must be satisfied that it is correctly formulated in that it:*

1. *takes account, where relevant, of:*
  - *individual risk, societal risks and societal concerns;*
  - *the sacrifice and benefits;*
  - *the technical feasibility of proposed control measures and the level of risk control they achieve;*
2. *maximises the use of:*
  - *inherent safety and the elimination of hazards;*
  - *the avoidance of risk;*
  - *the control of risk at source by the use of physical engineering controls;*

*whilst it,*
3. *minimises the need for:*
  - *procedural controls; and,*
  - *personal protective equipment;*

*and it is in a form that:*
4. *clearly defines the scope of the good practice and the circumstances where it is relevant; and,*
5. *can be clearly specified, e.g. it is either written down or is a well-defined and established practice adopted by an industrial/occupational sector.*

## APPENDIX C

### Extract from House of Lords Report [27] entitled 'Government policy on the management of risk' and the Government's response [28]

#### House of Lords' Report:

**Paragraph 101.** In our view, the use of ill-defined and ambiguous terms in risk-management and regulatory documents is generally unhelpful. There is a danger that they can induce an excessively cautious attitude to risk. We recommend that terms such as ALARP, Gross Disproportion and the Precautionary Principle should be more clearly defined or replaced with more specific and unambiguous requirements and concepts (para 73).

#### In response the Government stated:

18. The Government agrees that anything which can be seen as inducing inappropriate risk management, whether excessive risk aversion or inaction in the face of more serious risks, is unhelpful. It is also at odds with Government's aim of achieving robust and balanced management of risk. Clarification to assist dutyholders is always worth considering, but more prescription is unlikely to be the answer. Prescription reduces regulators' flexibility in devising policy options and operationally, can lead to a mechanistic and unquestioning approach; all of which can result in excessive caution. Instead, we prefer to encourage the use of judgment by those who are competent and best placed to manage risks, i.e. those duty-holders whose activities give rise to the risks in the first place. Excessive prescription by regulators encourages abdication of responsibility and is particularly unsuited to a world where change is endemic and accelerating.

19. Devices like ALARP, Gross Disproportion (GD), Tolerability of Risk (TOR) and Precautionary Principle (PP) are better suited as they have to be understood to be applied in a practical and pragmatic manner. Government acknowledges that while there is much good experience and practice around in the use of these decision-making frameworks, there is still room for improvement in increasing their acceptability to industry by better explanation and communication of their meaning and practical application. For example, the Office of Rail Regulation (ORR) plans to produce guidance early next year, in consultation with the Health and Safety Executive (HSE) and the rail industry, with the aim of clarifying what ORR expects of the industry to meet their legal obligations. On a wider front the Health and Safety Commission and HSE in collaboration with a number of other Government departments and influential external stakeholders, is leading on an initiative to explain and to promote sensible and proportionate risk management. A key element of this is a communications strategy based around a set of guiding principles and focussed messages aimed at empowering risk managers to concentrate on what really matters and to know when 'enough is enough'. This will be aided by the publication of a revision of HSE's guidance on risk assessment,

issue of exemplar risk assessments, and action by stakeholders to translate the principles into practice.

20. The Government's arguments for retaining the current frameworks based on ALARP, GD, TOR, etc. are that they have stood the test of time and are much envied and imitated the world over; the vast majority of situations do not require explicit determination or even consideration of ALARP, GD etc., and in those cases where they are, reliance on relevant and established good practice normally suffices (but this does not mean that judgment can be abdicated). Additionally reasonable practicability is enshrined in statute and embedded in risk management practice to the extent that any viable alternative, if one could be identified, might pose greater risks than the current approach. Further the frameworks allow for a balance to be struck between the multiple and disparate trade-offs between costs and benefits and other 'softer' socio-economic factors that occur in some cases. As their Lordships' report itself acknowledges (paragraphs 14–19), not everything can be captured by cost-benefit analysis. The Government does not have, and does not want to have, an algorithm or metric that can be applied in a mechanistic fashion—political and social judgments are a necessary and inevitable part of policy making and risk control by both Government and industry.

21. Specifically TOR and GD both allow for the context specific nature of decision-making in complex situations. In particular, they allow for variations in the way that people and society value protection against different types of risks and different circumstances of exposure to these. So a high 'proportionality factor' will be attached to providing controls in situations of high risk and where issues such as familiarity, control, uncertainty about the real level of risk, dread and scale of potential incident are deemed important. But what this factor is will be a matter for judgment underpinned by informed understanding. It is an important element in the dialogue between the regulator and the regulated and ultimately for the Courts to decide. It is a strength of this process that policy is adapted, guidance refined and increased clarity achieved on a case by case basis.

22. There is no single definition for the Precautionary Principle. However, in the context of the Green Book it is defined as: The concept that precautionary action can be taken to mitigate a perceived risk. Action may be justified even if the probability of that risk occurring is small, because the outcome might be very adverse. In practice the Precautionary Principle is interpreted as a flexible precautionary approach to enable innovation and learning in circumstances of significant complexity and uncertainty. As such, the supplement to the Green Book *Managing risks to the public: appraisal guidance* advises that precautionary approaches should be adopted alongside research and monitoring, and that highly restrictive or expensive precautionary interventions be reviewed on a regular basis in the light of research findings and new data.

23. All the frameworks are supported by clear public statements of Enforcement Policy in line with the principles of better regulation and an existing body of guidance and tools which promote consistent and balanced decision making in policy making and interventions.

## APPENDIX D

### Reducing Risks, Protecting People [21]

1 This document, published by HSE (and often referred to as 'R2P2'), was designed to set out an explanation of the basis for decisions about the regulation of risk. As for the data provided in the ALARP suite of guidance (Appendix B), it has a strong bias towards industry and strategic risk decisions. Nonetheless, it is helpful in providing some background thinking to HSE's approach to risk management in general.

2 The text indicates that HSE would not normally expect duty holders to consider risks other than those which:

- i) arise out of reasonably foreseeable behaviour
- ii) are under the control of the duty holder. In determining what is reasonably practicable, the risks which an employer (i.e. a designer in this case) needs to consider are limited to those which he is a position to eliminate or control.

3 Other extracts from R2P2:

#### **Purpose of this document**

##### *Para 12*

For a non-prescriptive regime to work, duty holders must have a clear understanding of what they must do to comply with their legal obligations. It is therefore not surprising that HSE, as the regulator responsible for implementing the law on health and safety, is being pressed with increasing frequency for explanations of how risk issues are addressed, both in general and in particular circumstances, so that the risks are regarded as tolerable.

#### **Introduction**

##### *Part 3*

HSE also starts with the expectation that:

- those controls, at a minimum, must achieve the standards of relevant good practice precautions, irrespective of specific risk estimates;
- where there is no relevant good practice, or the existing good practice is considered by HSE to be insufficient or inadequate, the decision as to what control measures are suitable will generally be informed by further risk assessment;

##### *Appendix 1*

Sets out some of the conventions adopted for undertaking risk assessment. It points out that:

- more often than not, a risk assessment is done in relation to a hypothetical person (a hypothetical type of individual who is

deliberately assumed to have some fixed relation to the hazard under consideration);

- the procedures adopted for handling uncertainty are in line with the precautionary principle and ensure that a lack of certainty is not a reason for not taking preventive action.

### **Main text**

**52** This (i.e. greater clarity and explanation) is reflected in the broadly stated principles of good regulation published by the Better Regulation Task Force. These require:

- proportionality: requiring action that is commensurate to the risks;

**142** In this context we would:

consider as authoritative sources of relevant good practice those enshrined in prescriptive legislation, Approved Codes of Practice and guidance produced by Government. We would also consider including as other sources of good practice, standards produced by Standards-making organisations (eg BS, CEN, CENELEC, ISO, IEC, ICRP) and guidance agreed by a body representing an industrial or occupational sector (eg trade federation, professional institution, sports governing body). Such considerations would take into account that HSE is a repository of information concerning good engineering, managerial and organisational practice, and would also include an assessment of the extent to which these sources had gained general acceptance within the safety movement.

### **Appendix 3: Some issues relevant to risk reduction options**

#### *Implications of case law on reasonable practicability*

##### *Para 5 (part)*

Moreover, HSE believes that in making this compliance assessment, the starting point for determining whether risk has been reduced as low as reasonably practicable, should be the present situation in the duty holder's undertaking. However, in certain circumstances, it will not be possible to assess options in this way. In such situations, the starting point should be an option which is known to be reasonably practicable (such as one which represents existing good practice). Any other options should be considered against that starting point, to determine whether further risk reduction measures are reasonably practicable.

## APPENDIX E

### Example of a Category 4 situation (see Section 3 Table 2)

A project includes a standard steel frame (column and beam construction) of 4 storeys, with a pitched roof framed in steel members. Connections are bolted.

#### *Implementation of Regulation 11 (See paragraph 1.8)*

Erection of steelwork involves work at height. This is a hazard and should be eliminated SFARP. This cannot be achieved, SFARP, as a 4 storey frame cannot be constructed at 'ground level' or the hazard eliminated by other means.

The Designer (assumed in this case to be the 'consultant' designer) now has an obligation to reduce the risks from (this) remaining hazard; the selected risk is falling from height. The Designer can play a part by configuring the design to allow partial pre-assembly of the roof at ground level thus reducing the quantum of work at height and thus the risk of falling. There is space for the larger crane which will be required. However, this alternative involves additional bracing steelwork and some enhanced member sizes, and hence additional cost.

Whether this action is necessary, or goes far enough, to satisfy Regulation 11 depends upon whether the actions taken are considered to be 'SFARP'.

The key aspects (using the Edwards v National Coal Board ('GD') test) are:

<b>Sacrifice made (Money, Time, Trouble)</b>	<b>Benefit gained (Risk reduction)</b>
Discussions with Contractors to determine feasibility, Cost of additional steelwork, Time for additional design, Additional time to fabricate, More space required on site prior to erection, Heavier craneage.	Less work at height, hence reduced risk of falling from height, (Possibly less time required overall)

**Is the left column (sacrifice made) grossly disproportionate to the right column (benefit gained) ?**

### Sacrifice compared with Benefit<sup>25</sup>

<sup>25</sup> There is some debate as to what qualifies to be considered; however this does not alter the argument or the conclusion presented

The effort required to reduce the risk of falling from height should be proportionate to the severity of risk and its probability of occurrence (which, combined and after mitigation, gives the residual risk). The residual risk in this case is of the highest severity (death could result). Determining a quantified probability of an accident occurring, and from this the financial cost of such an accident, is not considered practicable<sup>26</sup>. If this cost was calculated it is suspected that it would be of a value that would require the actions suggested in the left column of the Table above.

Notwithstanding this uncertainty, the prime question is 'at what point does the sacrifice in money, time and trouble' become grossly disproportionate to the benefit (reduction in risk)? Is it, for example:

- greater than £5000
- greater than 1% of the project cost
- greater than £1.3M (the value of a statistical life (VOSL) [29]) adjusted for the probability of occurrence, or:
- based on a reasoned professional judgement?

There is no accepted national 'practice' available to be followed and clearly the first two bullets are not rational approaches. Use of the third bullet requires statistical data which is unlikely to be available in this or any other similar example.

If it is left to the last bullet, then the resulting judgement should support some action by the designer, but the extent and means of implementation within a contractual situation remains unclear (see also paragraph 2.34). Many designers would consider it reasonable to take no direct action themselves, as this is a 'normal frame' and would leave any necessary measures to the (competent) contractor.

Hence, what this example clearly shows is that the application of SFARP, as legally defined, would suggest that action is required by the consultant Designer i.e. the extra steelwork and members. This has significant implications. However, in this case, application of reasoned professional judgement, would tend to conclude that no action is required<sup>27</sup>.

HSE has confirmed that the 'reasoned professional judgement' route is acceptable (paragraph 4.4).

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<sup>26</sup> And, if achieved, is likely nonetheless to result in inconsistency between different designers. Other construction situations are equally problematic in this respect.

<sup>27</sup> A specialist contractor made the point that of more importance is the provision of adequate information.

## APPENDIX F

### Members of ICE Panel

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John Carpenter*	ICE
Shelley Atkinson-Frost	Representing the Construction Confederation (until December 2008)
Brian Bell*	Representing IStructE
Peter Caplehorn	Representing RIBA
Lawrence Waterman	Representing IOSH

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\*Input into version 11 with Ann Metherall (ICE).

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