

This Peer Review is a free standing document representing work undertaken by the Inquiry into the Underlying Causes of Construction Fatal Accidents. The Peer Review has informed Rita Donaghy's Report<sup>a</sup> but the contents are not necessarily endorsed by the Inquiry nor necessarily reflected in Rita Donaghy's recommendations. It represents useful background work, with sources clearly identified, to inform discussion.

**Secretary of State for Work and Pensions  
Inquiry into the Underlying Causes of Construction Fatal Accidents**

**Independent Review of the Phase 2 External Research<sup>b</sup>**

**Professor Andrew Hale, Dr Sonia McKay and Professor David Walters  
Independent Peer Reviewers to the Inquiry  
July 2009**

**1. *General evaluation***

The report was commissioned to complement the Phase 1 report by HSE<sup>c</sup> reviewing its own commissioned research on construction fatal accidents. It aims to review the available English language literature in scientific journals about underlying causes, to collect good practice which may tackle those underlying causes from other countries and from representatives of the British construction industry and to propose and make an initial evaluation of a range of relevant strategies which might tackle the problems revealed.

The time available to the research team, because of the very tight scheduling of the whole Inquiry, was very limited, amounting initially to only three months, subsequently extended by some six weeks to allow more analysis of the data and opinions collected. Given those constraints of time, we consider that the work done has provided some valuable additional insights which can be placed alongside those revealed by the much more widely based consultations of the Chair, the HSE Phase 1 report on its own commissioned research and the Phase 2 study of a selection of fatal accident cases. This enables us to see which underlying factors identified in the Loughborough report as being causal of fatal accidents, or important as avenues for improvement, are also found in these other sources.

Since all of the sources of information for the Inquiry suffer in one way or another from methodological and statistical limitations such a comparison provides a valuable triangulation to pick out the issues identified in all sources as important, these being ones which can be particularly targeted. On the other hand, such a comparison can also identify issues which are seen to be of

---

<sup>a</sup> Rita Donaghy's Report to the Secretary of State for Work and Pensions. 'One Death is too Many: Inquiry into the Underlying Causes of Construction Fatal Accidents', July 2009. [www.dwp.gov.uk/publications/policy-publications/fatal-accidents-inquiry.shtml](http://www.dwp.gov.uk/publications/policy-publications/fatal-accidents-inquiry.shtml)

<sup>b</sup> Loughborough University. Phase 2 Report: 'Health and safety in the construction industry: Underlying causes of construction fatal accidents – External research', 2009. <http://www.hse.gov.uk/construction/inquiry.htm>

<sup>c</sup> Health and Safety Executive. Phase 1 Report: 'Inquiry into the Underlying Causes of Construction Fatal Accidents - A comprehensive review of recent work to consolidate and summarise existing knowledge', 2009. <http://www.hse.gov.uk/construction/inquiry.htm>

concern, or avenues of improvement seen as promising by the actors in the system, but which are not supported by literature or accident analysis. The latter may be myths or red herrings which can lead to a waste of resources, if pursued, but they can also be issues at the higher levels of the system hierarchy which are difficult to capture in accident analyses, but are nevertheless important. Only judgement can make that distinction. In Section 3 we present tables comparing the findings of the Loughborough report on important underlying causes and on possible prevention strategies with the factors found to be important in the HSE Phase 2 report on the fatal accident cases.

The report identifies clearly its own limitations, not only because of the time constraints, but also because of the limited availability of good information. We comment on these methodological limitations in Section 2 and make some suggestions for further research and data collection to overcome them.

## ***2. Methodological limitations***

The report draws on five main sources of information:

1. A literature survey of English language published literature on construction fatal and major accidents
2. Information about good practice in other countries aimed at tackling underlying causes of fatal accidents, drawn from a sample of 15 experts from 8 countries
3. Interviews, face-to-face or via phone or e-mail with a total of 42 national safety and health experts or practitioners from the British construction industry about underlying causes and prevention strategies
4. Interviews in the same way with 15 sole traders or workers for SMEs, representing hard to reach players in the system, about barriers to safe operation.
5. Two focus groups of, in total, 14 safety and health practitioners or site managers which rated and discussed a set of potential prevention strategies developed by the research team from the preceding sources

All of these have their limitations which must be borne in mind when reading the findings. The Loughborough report does acknowledge these, but we find it important to comment on them again here.

### **1. Literature Survey.**

We are not convinced that the international literature reviewed represents a state of the art literature review of all the material that is relevant to understanding the nature of risk in the construction industry. It now covers the main sources of readily available health and safety research on the industry in English and in scientific journals, but, as such it identifies some of the limitations of a conventional literature review in these respects, as well as the difficulties in accessing and evaluating useful and relevant material that has not found its way into

refereed research publication. There is a large 'grey' literature which is not tapped, and, with no tradition of publication by practitioners in the industry, there is a fund of good practice which only with difficulty emerges from companies. This last shortcoming places a greater emphasis on the need for the other data sources used.

There also remains a job to be done on the wider literature. This is especially so given the acknowledged role of structure, organization, employment relations, regulation and business practice in influencing health and safety performance in the British construction industry. A more comprehensive review should address these issues in the industry in the UK and other countries, as well as the same issues in other industries internationally, in order to gain a better understanding of the supports and constraints of good practice that could be applicable to the industry. It is not just a question of understanding the past and present practice within the industry itself, but also the potential of experiences from elsewhere. Some of the current issues for managing health and safety in the industry, such as the nature of the employment relationship, fragmented, disorganized work and its management, small firms and the role of regulation in relation to supply chains, feature in other industries and in other countries. There maybe lessons from these experiences that could apply to current and future policy and practice in the British construction industry. We feel it would be useful to explore this further.

## 2. International good practice.

The report has a selective and in many ways superficial coverage of good practice from other countries, which seems to have been based on a rather ad hoc collection of material from contacts easily available to the research team, rather than a systematic and comprehensive search, for which, however, the time was not available. We believe that there is a place for such a systematic search, coupled with a more robust review of the success of the practices. It is also important that such practices be placed more firmly in the context of their national safety and health and regulatory systems, so that it is possible to assess whether, and to what extent, they are portable to another country such as Britain.

## 3. Interviews and focus groups with experts.

The selection of people for both interviews and focus groups was, of necessity, limited and, particularly for the focus groups, regionally biased to make for ease of contact and travel. The vast majority of the interviews about current practices and barriers to prevention were conducted with safety and health directors, managers and practitioners from medium and large companies. Whilst these are excellent sources of factual information, there may be a tendency for them to look at the realities of construction safety through specific spectacles, which provide a bias which is different from that provided by the spectacles

used by line and top managers or workers representatives and their trades unions. This needs to be borne in mind when reading the Loughborough report

There is some support for this statement in the difference in the results of the assessments of impact on safety and ease of implementation by the senior industry group (all safety and health professionals) and the site and line managers group for those strategies rated by both groups. The site and project manager group was more optimistic about the size of the impact of more of the different strategies rated than the safety and health experts (15:2 with 12 showing no difference). They were also more optimistic about the ease of implementation of more strategies (12:5 with 12 showing no difference).

The sample of interviews and consultations carried out by the Chair covers a far wider spectrum of actors in the whole construction industry system and will therefore reflect a more balanced view across that whole system.

#### 4. Interviews with SMEs.

The interviews with workers, often the sole trader, in SMEs are a welcome addition to the sources of evidence, as they illustrate the reality of the vast majority of construction industry workers. The sample is, however, very small and limited to the East Midlands. It does show that it is possible to collect useful data from this group, and we consider that this is a line of study which should be pursued more thoroughly in the future. We welcome the more recent research by HSE into such firms, which is also quoted in the Loughborough report. This helps to correct the bias of information from the other interviews and from much of the research literature, which concentrates on medium and large companies.

#### 5. Focus groups.

The limited representativity of the membership of the focus groups has been mentioned above. This means that great care must be taken in interpreting the results. The presentation of these results as numbers has the effect of making them seem more reliable than they are, given the small numbers taking part because of time limitations.

It is unfortunate that the list of possible prevention strategies developed by the research group from this study and their previous experience could not have been aligned with the findings from other parts of the Inquiry, and particularly with the recommendations being developed for the Inquiry report itself. This would have added value to the results. A number of the proposed strategies are also phrased in a somewhat generic and vague way. The lack of good literature with proof of the importance of the relevance of underlying causal factors. Means that prevention strategies cannot be based on strong and clear evidence.

They therefore rely more on their face validity, which is often too vague to focus the efforts clearly. To sharpen the strategies for prevention much more work is needed in analyzing accidents in depth and evaluating and sharing proven good practice.

Despite these strictures on this aspect of the Loughborough study, we are convinced that this sort of focus group study, provided that it is expanded and made more representative, is a valuable study technique to assess priorities in the absence of stronger evidence.

Because of these limitations we re-emphasise the need to use a clear triangulation to assess the findings. Only where several sources of information point to the same conclusion can we have greater confidence in it. There is still a significant work to be done in not only expanding our evidence base, but in resolving the apparent contradictions between the different information sources.

### **3. Findings**

The Loughborough report (Section 3) identified 19 different factors to be important as underlying causes of construction fatal accidents and grouped them in three categories of 'macro', 'mezzo' and 'micro' depending on whether they were at the system, the organisational/company, or the workplace level. These factors can be mapped to the factors found to be relevant to the fatal accident cases in the HSE Phase 2 report (figure 4). Table 1 shows this mapping, with items found to be very important in the HSE studies in red, those relatively important in blue and those relatively unimportant in black.

There are no important influences in figure 4 of the HSE fatal accident cases report which are not identified in the Loughborough report, but not all of the Loughborough influences are found with relatively great frequency in the fatalities, especially those at the macro and mezzo level. This may reflect the difficulty of identifying clear causal links with factors at higher system levels in fatal accident case analysis.

In Table 2 the same matching is made between the prevention strategies identified in Section 4 of the Loughborough report and the factors identified in the HSE fatal accident cases. The same split into 'macro', 'mezzo', 'micro' is used here by Loughborough, but there is also a division into themes:

Theme 1: Enforcement and Compliance

Theme 2: Competency and Training

Theme 3: Culture and Mindset

The colour coding for the fatal cases is the same as in Table 1. the colour coding in the Loughborough prevention strategies is: **Red = high priority (■■■)**, **Blue = medium priority (■■)**, **Green = low priority (■)**, Black = unknown priority

Again the matching is best at the micro level, perhaps reflecting the same bias in accident investigations towards identifying factors at the lower system levels.

Table 1

<b>Loughborough factor Section 3</b>	<b>Causal influences HSE report fatal accident cases fig 4</b>
<b>Macro factors</b>	
3.2.1 Immature corporate systems	■ ■ <b>Ownership/control of safety</b>
3.2.2 Inappropriate enforcement	Regulatory
3.2.3 Lack of proper accident data	Monitoring & improvement
3.2.4 Lack of leadership from government as principal client	Political/market ■ ■ <b>Ownership/control of safety</b>
3.2.5 Lack of influence of trades unions (not seen as important)	Societal/political/Labour relations & worker engagement
<b>Mezzo factors</b>	
3.3.1 Immature project systems & processes	■ ■ ■ <b>Planning &amp; Risk assessment</b> Design for construction
3.3.2 Inappropriate procurement & supply chain arrangements	Monitoring/correction/supervision ■ ■ <b>Contracting strategy</b>
3.3.3 Lack of understanding & engagement by design community	■ ■ ■ <b>Hardware design, purchase, installation (ergonomics/usability)</b>
3.3.4 Lack of proper accident investigation/data and learning	Monitoring & improvement
<b>Micro factors</b>	
3.4.1 Lack of individual competency & understanding of workers & supervisors	■ ■ ■ <b>Competence &amp; suitability</b> ■ ■ <b>Competence, selection, training, info</b>
3.4.2 Ineffectiveness or lack of training & certification of companies	■ ■ ■ <b>Competence &amp; suitability</b> ■ ■ <b>Competence, selection, training, info</b>
3.4.3 Lack of ownership/engagement/empowerment/communication/responsibility of workers & supervisors	■ ■ ■ <b>Participation/motivation/conflict resolution</b> ■ ■ <b>Communication &amp; cooperation</b> ■ ■ <b>Monitoring/correction/supervision</b> ■ ■ <b>Contracting strategy</b>
3.4.4 Poor behaviour	■ ■ ■ <b>Participation/motivation/conflict resolution</b> ■ ■ <b>Monitoring/correction/supervision</b>
3.4.5 Cost	Market, Company profitability ■ ■ ■ <b>Conflict resolution</b>
3.4.6 Poor equipment or misuse thereof (not often identified except sole trader)	■ ■ <b>Hardware functioning</b> ■ ■ ■ <b>Hardware usability</b>
3.4.7 Site hazards	■ ■ ■ <b>Workplace hazards</b>
3.4.8 Poor employment practices	■ ■ <b>Contracting strategy</b>
3.4.9 Itinerant workforce	■ ■ <b>Contracting strategy</b>
3.4.10 Inadequate management/provision for vulnerable workers	■ ■ <b>Contracting strategy</b>

Table 2

Loughborough Proposed Prevention Strategy	Causal influences HSE report fatal accident cases fig 4
<b>Macro strategies</b>	
1.1 <b>Certify all construction organisations</b> ■■	Political, Regulatory
1.2 <b>Link building control approval to H&amp;S</b> ■■	Political, Regulatory
1.3 Divide HSE	Political, Regulatory
1.4 <b>Enhance enforcement activities</b> ■■■	Regulatory
1.5 <b>Focus on overall effective management systems</b> ■■	Safety management, Organisational structure, Company culture
1.6 <b>Ensure government is exemplary client</b> ■■■	Political/market ■■ <b>Ownership/control of safety</b>
1.7 Creation of government construction body	Political
2.1 <b>Provide free advice &amp; training</b> ■■■	■■ <b>Competence/selection/training/information</b>
2.2 <b>Conduct finer accident data analysis</b> ■■■	Monitoring/improvement
2.3 <b>Advice/legislation for accident investigation &amp; learning</b> ■■■	Monitoring/improvement, Regulatory
2.4 <b>Conduct evaluation of interventions</b> ■■■	Monitoring/improvement
2.5 <b>Implement competency standards</b> ■■■	■■ <b>Competence/selection/training/information</b>
2.6 <b>Develop training/competency in design community</b> ■■■	■■■ <b>Hardware design/purchase/installation</b>
3.1 <b>Change HSE approach</b> ■■	Regulatory
3.2 <b>Independent accident investigation board</b> ■	Political, Regulatory Monitoring/improvement
3.3 <b>Reduce poor employment practice</b> ■	■■ <b>Contracting strategy</b>
3.4 <b>Tackle safety from consumer protection perspective</b> ■■■	■■ <b>Competence/selection/training/information</b> Regulatory, Political
3.5 <b>Outlaw inappropriate tools/equipment</b> ■■■	■■■ <b>Hardware design/purchase/installation</b>
3.6 Insurers to demand greater safety provision by organisations	Regulatory, Political
<b>Mezzo strategies</b>	
1.8 Enhance any connection between employment type & safety	■■ <b>Contracting strategy</b>
2.7 <b>Develop strong organisational competency &amp; maturity</b> ■■■	■■ <b>Competence/selection/training/information</b>
2.8 <b>Conduct enhanced examination of accident/HPI data</b> ■■■	Monitoring/improvement
2.9 <b>Conduct in-house evaluation of interventions</b> ■■■	Monitoring/improvement
3.7 Create minimum time period before site work starts	■■■ <b>Planning &amp; Risk assessment</b>
<b>Micro strategies</b>	
1.9 Organisations to implement licensing requirements	■■ <b>Contracting strategy</b> ■■ <b>Competence/selection/training/information</b>
1.10 <b>Increase number of supervisors</b> ■■■	■■ <b>Monitoring/correction/supervision</b>
2.10 <b>Develop individual competency</b> ■■■	■■■ <b>Competence/suitability</b>
3.8 <b>Make sub-contractors part of team</b> ■■■	■■■ <b>Participation/motivation/conflict resolution</b> ■■ <b>Communication/cooperation</b>
3.9 <b>Remove bonus payment</b> ■■■	■■■ <b>Participation/motivation/conflict resolution</b>
3.10 <b>Encourage/manage diversity in the industry</b> ■■	■■ <b>Competence/selection/training/information</b> Manpower planning