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Development of a web-based Leadership and Worker Engagement (LWE) Toolkit for small and medium enterprises in construction

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Development of a web-based Leadership and Worker Engagement (LWE) Toolkit for small and medium enterprises in construction

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This report summarises the final phase of a project ongoing since 2007, aiming to improve health and safety practices in construction through leadership and worker engagement (LWE). A web-based, interactive toolkit was developed with SMEs in mind. In-depth feedback (workshops, focus groups, interviews) was obtained from 17 companies (13 SMEs) at key milestones. In parallel, the validity and reliability of a Health and Safety (cultural) Diagnostic Tool (HSDT) contained within the toolkit was examined.

The toolkit was found to be useful for SMEs; it met their needs, they wanted to continue its use, had secured some quick wins and thought that other SMEs would benefit from using it. The added value dimension of the toolkit was considered to be its prescriptive ('how to') nature with simple tools and techniques. The HSDT was considered to be sufficiently reliable and valid, and helpful for making sure that changes adopted suit the company's level of (cultural) readiness.

Important considerations for ongoing implementation of the toolkit once launched on HSE's website include: how to effectively market it to SMEs, setting up a support mechanism for users, keeping the toolkit 'live', and evaluating its effectiveness in practice eg through case studies of SMEs using it.

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Air Products	Ltd	PX Ltd
Allied Bakeries	Howorth Air Technology Ltd	QHS Solutions
Antalis Ltd	Hubbard Products Ltd	Quality Repair Centre
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Bardsley Construction Ltd	Imerys Fire and Rescue	Richardson Fencing Ltd
Barrett Steel	Integrated Health & Safety Ltd	Safe Systems Ltd
Benfield Motor Group	International Power	Safe-T-Solutions, UK, Ltd
Bethel Group plc	Joe Roocroft & Sons Ltd	Safety Mentoring Services Ltd
Birmingham City Council	John Turner & Sons Ltd	Safeway Flooring Ltd
BioFocus	JWD Rainwater Systems Ltd	Seabird Exploration
BOC Gases	Komori UK Ltd	Shepherds
Bombardier Transportation	Leeds University	Star Refrigeration
British Airways Maintenance	Life Technologies	Stephenson College
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Cape Industrial Services Ltd	LTC limited	Still Materials Handling Ltd
Carnell Support Services Ltd	Lucite International UK Ltd	Tarmac Ltd TQM West
Carrs Flour Greens	Mansell Finishes Ltd	Tesco
Casey	MedImmune Uk Ltd	The Casey Group Ltd
Central High Rise Ltd	Merlin Entertainments	The Green Omnibus
Citation	Metroline	The Tool Clinic
Comet Group UK	Morganest	Trent and Dove Housing
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Conwy County Borough Council	New Charter Building Co Ltd	Vanderlande
Davis Wagon Services	NHS Lothian	Victrex plc
Delta Steeplejacks	Nippon Gohsei	Vion Food Group
DHL	Northern foods	Viridor
Dust control Systems Ltd	NSG	Vopak Chemicals EMEA BV
Ebm-papst UK Ltd	NSK Bearings Europe	Walsall Council
Environmental Treatment Systems	ODE	Waste Recycling Group
Ltd	Offshore Design Engineering	William Hare Ltd
E.RU.K	Palletline PLC	

[1] *A forum set up between HSE and major construction companies operating in the UK to share best practice and consider possible solutions for common safety, health and environment issues across the construction industry. Representation includes: Morgan Ashurst, Laing O'Rourke, Kier Group Plc, Optimus She, BAA, Bovis Homes, Bovis Lend Lease, Carillion plc, Construction Skills, William Hare Ltd., MW Kellogg, Mace and Magnox Electric.*

KEY MESSAGES

The key messages that emerged from this project are summarised below. These represent important considerations for ongoing implementation of the toolkit once launched.

- A key consideration is how to effectively market the toolkit to construction SMEs to raise awareness of its existence. Important messages to communicate to SMEs to motivate them to access the toolkit include:
    - that it is there to help them rather than impose new restrictions, containing step-by-step 'how to' information for improving health and safety that is both practical and evidence-based;
    - that it does not need to take much time; tools can be selected to meet current needs; and
    - whilst not replacing regular compliance duties, it can serve various purposes, most noteworthy as a means to engage with site operatives, subcontractors and the supply chain to improve health and safety attitudes/behaviours.
- While located on the HSE construction website, industry ownership and promotion of the toolkit is paramount. Offering a support mechanism would also benefit SMEs using the toolkit to enable them to seek advice when needed. Principal contractors and large companies seem best placed to offer such support.
- Innovative means are needed to communicate with small companies; industry word-of-mouth seems to offer the most potential for raising awareness of the toolkit (e.g. through industry bodies, construction events and social networking). Of critical importance is demonstrating the 'what's in it for me' case. The slide show at the start of the toolkit presenting the business, legal and moral case for good leadership and worker engagement (LWE) to motivate use of the toolkit could be used more broadly in terms of promotion activities.
- The incorporation of future case studies into the business case of the benefits accrued by other SMEs using the toolkit offers a powerful mechanism for encouraging wider uptake and reinforces the message that 'good health and safety is good for business'. In addition, the toolkit should ideally be rolled out in an industry context in which industry LWE norms are established (e.g. principal contractors communicating lessons learned, LWE is built into business contracts). These practices would ensure that appropriate upstream and downstream influences are in place and encourage optimal impact.
- The need to improve leadership and worker engagement practices does not appear to be an issue specific to the construction sector. Other industries might benefit, therefore, from having access to the toolkit. With appropriate tailoring, the tools and guidance could be applied to other industries.
- It is vital that the toolkit is kept 'live' and maintained over time. Future case studies offer a valuable way of updating the business case. This also provides a means of evaluating the effectiveness of the toolkit in practice through tracking improvements to health and safety in companies over time, which offers further business evidence that remains optimally relevant to SMEs.

A note on transferability across SMEs. The approach taken in this project was to obtain in-depth feedback from 17 companies (13 SMEs) on the web-based toolkit at key development milestones. The high degree of consistency of findings between testing sessions and with those obtained from eight SMEs involved in earlier stages of the project provided some degree of confidence that sufficient feedback was obtained.

EXECUTIVE SUMMARY

CONTEXT

The construction industry is continually seeking to find innovative ways in which it can reduce accidents and ill health by engaging with its workforce and promoting sustainable behaviour change through good leadership to ensure that health and safety is taken seriously on site. Whilst the principal contractors and larger companies may have begun to incorporate leadership and worker engagement (LWE) into their health and safety practices, uptake appears to be limited amongst the small and medium sized enterprises (SMEs) that characterise the industry.

This report summarises the work conducted in the final phase (III) of a project ongoing since 2007. The project involved three user-led phases; reports relating to previous phases are referenced throughout for further information. The first phase (I) (Oct 07 - Mar 08) involved a qualitative comparison of the behaviour change approaches used by industry principal contractors and consultants with the best practice outlined in the contemporary evidence base. A key finding emerging from this work was the need to equip SMEs with the knowledge and skills to implement LWE themselves. Accordingly, in the second phase (II) (Apr 08 - Mar 09) the raw content of a toolkit for construction SMEs was developed. The content was designed to ensure that all the prerequisites necessary for permitting sustainable behaviour change identified from Phase I were covered (i.e. motivating management and the seven steps to LWE[2]). For each component a range of strategies, tools, techniques, information sheets and/or video footage were produced in a format palatable to SMEs, the intention being for them to select those that best suit their business and workforce needs. These paper-based tools were then converted into a web-based format in the current phase III (from Sep 09), following recommendations from SME leaders that the toolkit be presented as an interactive website. The toolkit is planned for release on the Health and Safety Executive's (HSE's) construction website in Spring 2011.

AIMS AND OBJECTIVES

The overarching aim of this project was to motivate and to provide assistance with implementation of LWE practices to those either in control of construction work or in a position to exercise leadership (i.e. those employing five or more workers) within small and medium sized construction companies. The three primary objectives of phase III are:

1. To develop, test and refine a web-based version of the toolkit to optimise accessibility and usability for SME leaders as principal users of the toolkit via user needs assessments, user trials and usability testing.

2. To motivate SME leaders to use the toolkit through development of a 'What's in it for me and my business' slide show at the start of the toolkit.

3. To carry out reliability and validity testing of the cultural diagnostic tool (the Health and Safety Diagnostic Tool, HSDT), which represents the first assessment that leaders carry out to ensure that subsequent action taken 'fits' the organisation's culture (i.e. that the company is ready for such change).

[2] *i.e. (1) providing assessment measures, (2) assessing root causes, (3) integrating LWE practices with the health and safety management system, (4) advice on leadership skills, (5) strategies for motivating the workforce, (6) advice on how to instigate and (7) sustain actual change over time.*

APPROACH

Researchers were cognisant of the need to achieve a balance between creating a toolkit that is scientifically robust, hence consistent with best practice in behaviour change, and usable from a users' (i.e. SME leaders') perspective. As such, the approach taken in phase III was to seek industry feedback on the language, style and presentation of the toolkit from the outset and at key milestones during the development process. In parallel, ensuring that the framework derived from the literature remained relatively unchanged, and therefore followed best practice in creating sustainable change. The current phase of the project was heavily qualitative in its focus, making use of workshops, focus groups and interviews to collate the views of construction leaders, mostly SMEs, and some workers who participated in the testing process. As such, development was user-led rather than researcher-led. Ongoing collaboration with principal contractors and consultants that belong to a LWE Forum set up between the industry and HSE also helped to shape the content of the toolkit as it was translated into an electronic format. A mixed methods approach was followed to test the validity and reliability of the HSDT. Qualitative feedback was obtained from subject-matter-experts pertaining to its validity and quantitative estimates of reliability (i.e. test-retest and internal consistency) were produced.

FINDINGS

Feedback obtained from participating companies (mostly SMEs) suggests that, from their perspective, the *overarching aim* of the project has been achieved (i.e. to motivate and to provide assistance with implementation of LWE practices to those either in control of construction work or in a position to exercise leadership). Similar feedback was received from participants at each testing stage (initial, mid- and post-development of the toolkit) providing some degree of confidence that sufficient feedback was obtained. It should be noted, however, that formal evaluation of the toolkit has yet to be conducted.

General views. The toolkit was positively received and considered to be a "*valuable asset*" for construction SMEs. The use of positive messages that were neither intimidating nor aggressive, in conjunction with the toolkit's focus upon behaviour change strategies, was considered innovative. The toolkit was thought to serve a variety of purposes including engagement of staff, subcontractors and the supply chain, promotion of a positive health and safety culture and a means to benchmark progress. The added value dimension was considered to be its prescriptive ('how to') nature with simple tools and techniques provided. It was considered to be a useful educational resource for SMEs on what LWE involves. Many SMEs realised that they had overlooked the potential impact of their own leadership practices on the success of their worker engagement activities and therefore welcomed the leadership assessment tools and guidance.

The *three objectives* in phase III have also been achieved; the results for each are presented in turn.

Objective 1: **To develop, test and refine a web-based version of the toolkit that optimises accessibility and usability for SME leaders as principal users of the toolkit.**

The toolkit was useful for the SMEs involved in phase III; it met their needs, they wanted to continue its use, had secured some quick wins and thought that other SMEs would benefit from using it. They felt that a balance had been struck between providing the necessary guidance and tools whilst not overwhelming users. The seven steps to LWE were viewed favourably and adhered to by most. All steps were considered to contain the right amount of tools and *'how to'* guidance. The interactive tools were favoured and thought to increase usability in comparison with a paper-based toolkit. While SMEs welcomed the broad mix of guidance, templates, tools

and training, small companies appreciated the option of completing selected (key) tools as a minimum requirement.

Whilst fundamentally conceived as a resource for SME leaders, webpages were developed specifically for construction workers. Findings revealed, however, that site workers are unlikely to use the toolkit of their own volition. Whilst they found the information useful, they (and their leaders) felt that such knowledge should be cascaded through other means, notably training.

Objective 2: **To motivate SME leaders to use the toolkit through development of a 'What's in it for me and my business' slide show at the start of the toolkit.**

The use of the legal, moral and business case in the slide show was regarded as a powerful way of securing management buy-in to motivate SME leaders to implement LWE. It emerged as one of the preferred aspects of the toolkit, thought to be relevant to the industry and a good way to drive key messages home. Participants felt that future case studies of SMEs using the toolkit would be best placed in the slideshow to contextualise and strengthen the business and moral benefits. Too much emphasis is currently on the consequences of poor health and safety management than the benefits, yet the addition of case studies would help to balance this out.

Objective 3: **To carry out reliability and validity testing of the HSDT.**

Based on the findings from the testing conducted to date, the reliability and validity of the HSDT is acceptable. It was obvious to experts and participants that the tool is a means of diagnosing health and safety culture maturity (i.e. it has 'face validity'). The statements measuring each building block appear to cover the facets underlying health and safety culture (i.e. it has 'content' validity). The tool also contains statements that are consistent with one another and generate the same measurements from one occasion to another (i.e. it is reliable). General feedback on the tool suggests that it provides a quick and simple means for SMEs to gauge their level of health and safety culture maturity, helping them to introduce changes that suit the company's level of readiness for change (i.e. current level of maturity).

Toolkit development areas. Further areas to consider for ongoing development/maintenance of the toolkit suggested by SMEs include the addition of health specific guidance and a tracking document to evidence aspects of the toolkit completed. A support mechanism for SMEs using the toolkit should also ideally be in place following its launch.

CONCLUSION

In summary, phase III findings illustrate the utility of the toolkit as a way of cascading good practice in LWE to construction SMEs and initiating health and safety improvements. The toolkit represents a distillation of the good practices of principal contractors and industry consultants. These practices have now been packaged in a way that is amenable to SMEs.

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1. INTRODUCTION

1.1 ISSUE ADDRESSED

The construction sector is one of the UK's most important economic sectors, with over 250,000 organisations, 99% of which are small and medium sized enterprises (SMEs). It is also one of the most dangerous sectors to work in. This industry is therefore continually seeking to find innovative ways in which it can reduce accidents and ill health by engaging with its workforce and promoting sustainable behaviour change through good leadership, to ensure that health and safety is taken seriously on site. Whilst the principal contractors and larger companies in the sector have integrated leadership and worker engagement (LWE) practices into their health and safety initiatives, many of the SMEs that make up the industry have yet to take these on board. There is the need therefore to package the good practice of large companies into a format suitable for SME leaders[3] and to effectively cascade this learning through the industry.

1.2 AIMS AND OBJECTIVES

The overarching aim of this project is to motivate and to provide assistance with implementation of LWE practices to those either in control of construction work or in a position to exercise leadership (i.e. those employing five or more workers[4]). This aim will be met by providing a range of products to enable them to lead, engage and develop their workforce better, in order to reduce their risk of accidents, incidents and ill health. The current phase (III) of this project aims to develop the paper-based toolkit developed in a previous phase (II) into a usable and interactive web-based product for the construction industry. This will be accessible for both leaders responsible for the health and safety of their workforce and for those workers who wish to either develop their own skills or learning, or to actively promote health and safety within their own organisation.

The three primary objectives of phase III are:

1. To develop, test and refine a web-based version of the toolkit that optimises accessibility and usability for SME leaders as principal users of the toolkit. Testing will be conducted at key time points (i.e. before, during and post-development) to ensure that the toolkit is tailored to its users. (This is work stream A of phase III.)

2. To motivate SME leaders to use the toolkit through development of a 'What's in it for me and my business' slide show at the start of the toolkit. (Work stream B.)

3. To carry out reliability and validity testing of the cultural diagnostic tool (the Health and Safety Diagnostic Tool, HSDT), which represents the first assessment that leaders carry out to ensure that subsequent action taken 'fits' the organisation's culture (i.e. the company is ready for the change, thus preventing initiatives being implemented prematurely and failing as a consequence). It is vital, therefore, that this measure is both accurate and reliable. (Work stream C.)

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[3] The term 'leader' is used throughout this report to refer to the person responsible for health and safety, whether they are the dutyholder, or in a managerial position. Where the term 'manager' is used, this refers specifically to participants involved in this project that held the position of health and safety manager.

[4] It is recognised that micro-businesses (with up to four employees) may neither have the resources nor inclination to devote to implementation and ongoing monitoring of good LWE practice using this approach. This toolkit was designed, however, with the intention of micro businesses indirectly benefiting from the outputs of the process through contractual work with larger industry players (i.e. the cascading of good practice through industry).

1.3 BACKGROUND

1.3.1 The build up to a web-based toolkit

The need for a prescriptive toolkit that presents clear steps for achieving LWE, containing tools that are flexible enough to be readily applied in different construction companies, emerged from earlier phases of this project. The project involved three phases. An initial *phase I* (Oct 07 - Mar 08) highlighted the need to equip SME leaders with the knowledge and skills to implement LWE themselves [1]. This finding stemmed from a qualitative comparison of the approaches used by industry principal contractors and consultants with those identified as demonstrating best practice in the contemporary evidence base. Seven steps were identified as necessary for permitting sustainable behaviour change in order to raise health and safety standards across industry (see Figure 1). This provided the framework for the LWE toolkit, the raw content for which was subsequently developed in *phase II* (Apr 08 - Mar 09). Early phase II findings (literature reviews and interviews with SME leaders highlighted the need for the toolkit to be simple and intuitive for SME leaders to implement). In recognition that for successful implementation the approach adopted needs to 'fit' the organisation's culture [3], a Health and Safety Diagnostic Tool (HSDT) was also developed to enable a quick, 'rule-of-thumb' assessment of current health and safety cultural maturity. These paper-based tools were converted into a web-based format in phase III (ongoing since Sep 09) following the recommendation of SME leaders that participated in phase II for the tools and guidance to be as interactive as possible.

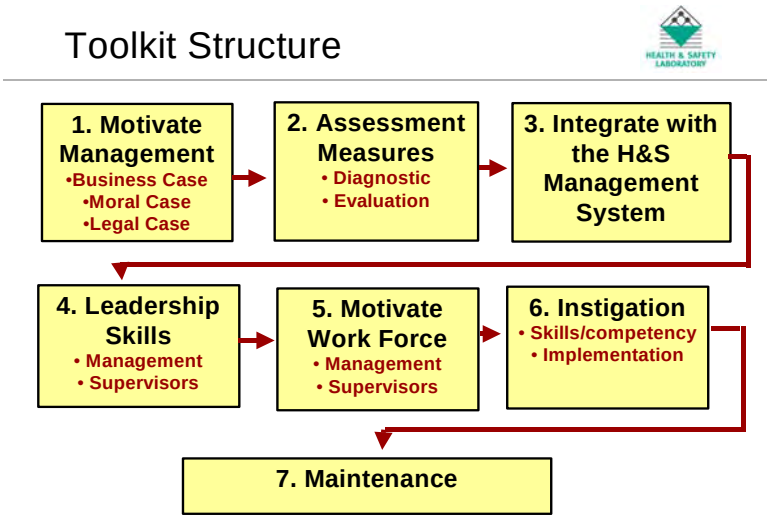

Figure 1 Toolkit framework that emerged in phase II

Each development phase of the toolkit was guided by ongoing advice received from participating SMEs and industry practitioners (principal contractors and consultants). Appendix 1 summarises the contribution from industry for each phase of the project in turn.

1.3.2 About the web-based LWE toolkit

Box 1 summarises the rationale underlying the development of a *web-based* LWE toolkit for construction SMEs. The toolkit will be freely available to those wishing to use it on the HSE Construction Division web pages in 2011.

- Feasibility testing the paper-based toolkit with six SMEs in phase II highlighted the need for the tools and guidance to be available as an interactive website.
- Feedback from LWE Forum members upon completion of phase II stressed the need for information to be jargon-free, easily understood, delivered in small sections and straightforward to use.
- From a theoretical standpoint, an e-version would encourage users to progress through the toolkit in a sequential order thus advocating a holistic approach to behaviour change.
- A web-based tool is conducive to incorporating two access routes, one for managers and one for workers. This is consistent with best practice in behaviour change [4] through advocating a top-down (leader-led) and bottom-up (worker-led) approach to LWE. Having separate access routes for managers and workers means that the content can be suitably tailored to both audiences.

Box 1 Rationale for developing a web-based toolkit

Slight modifications were made to the framework that was derived from phase II (illustrated in Figure 1) to ensure that the content of the toolkit could be suitably tailored to a web-based application. Figure 2 shows the framework that was adopted for the web-based toolkit. The toolkit was structured around eight webpages, one for each step of the toolkit, and an initial webpage with links to instructions on use and the slide show presenting the business, legal and moral case for LWE to motivate leaders. Each step (other than Step 1 which housed the HSDT) contained four webpages, namely, (1) an Introduction (what the step involves and why it is important), (2) a Key Tool (to enable SME leaders to quickly begin using the toolkit), (3) Further Tools (the remainder of the (full) toolkit), and (4) a Summary (key messages to take away and what leaders need to do as a minimum).

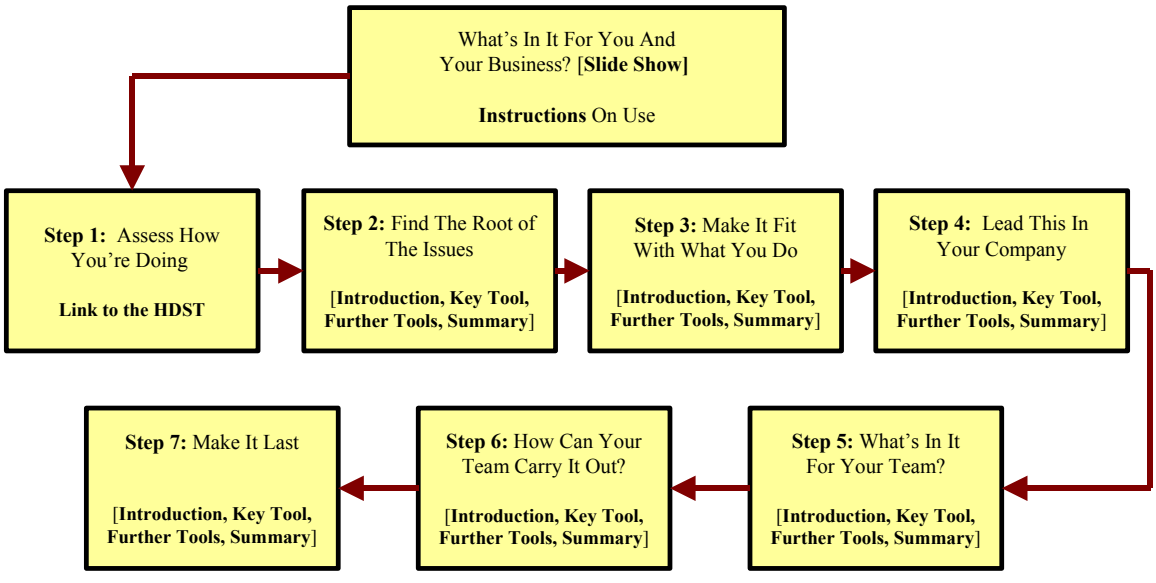

Figure 2 Framework for the web-based toolkit

The toolkit is planned for release on the Health and Safety Executive's (HSE's) construction website in Spring 2011.

2. IMPLICATIONS

2.1 ENCOURAGING UPTAKE OF THE TOOLKIT AMONGST CONSTRUCTION SMES

2.1.1 Guiding SMEs in the right direction

The toolkit conveys positive messages as a way of motivating SME leaders to improve health and safety through LWE. This differs from HSE's traditional enforcement model and is consistent with the current emphasis in public policy on 'nudge'[5] and 'think'[6] approaches for influencing behaviour [5]. The SMEs that participated in this project considered the toolkit to be innovative guidance and welcomed such a positive approach that effectively educated them on the soft-skills relating to health and safety management, giving them some key choices to make whilst guiding them in the right direction for generating improvements. Nevertheless, SMEs felt that a support mechanism (e.g. liaison with large companies) for additional help as and when required would appeal to them and encourage ongoing use. Furthermore, SMEs pointed out aspects of the toolkit, such as a slide show at the start to motivate buy-in from leaders, where messages relating to the adverse consequences of using the toolkit outweigh those about the benefits of its use. This is largely because the benefits are relatively unknown at this stage. It is not until companies start using the toolkit that these can be captured and communicated.

Current government emphasis on deregulation also points towards relying heavily on the business and moral case (i.e. 'think' and 'nudge') for LWE and less so on legal justifications (or 'shove' approach) [5]. Results from this project have highlighted the potential power of 'business benefits', particularly those accrued by other SMEs using the toolkit. Communication of these benefits through case studies offers a powerful mechanism for encouraging wide uptake of the toolkit amongst construction SMEs through appreciation of the potential value of the toolkit i.e. the positive change that it can bring to their business in terms of improvements to health and safety. It reinforces the message that 'good health and safety is good for business' and is 'vital for winning work'. Taking advantage of existing networks to educate (think) and nudge SMEs towards good health and safety practice through use of the toolkit should also be considered by spreading the word through, for example, industry bodies, construction events and social networking. HSE inspectors also have a role to play by making SMEs aware of the toolkit during company visits, particularly where they feel that improvements to leadership and/or worker engagement are warranted. The legislation surrounding worker engagement should help to make SME leaders more susceptible to these various nudges.

2.1.2 Messages to promote the toolkit to SMEs

The principal barrier to widespread uptake of the toolkit amongst SMEs seems to be their lack of awareness that it actually exists if not promoted through other channels than HSE's website. This is particularly important for small companies that might not regularly access the website. Whilst innovative means of communication as suggested above in section 2.1.1 should help to overcome this barrier, careful consideration needs to be given to the messages that are conveyed in order to motivate SME leaders to seek out the toolkit of their own volition. Phase III results

[5] *Making desirable behaviour an obvious choice for people, effective for specific shifts in behaviour.*
[6] *Informing and educating people of the need for and benefits of new behaviour, powerful in building motivation to drive transformational changes.*

and industry advice received from LWE Forum[7] members suggest the following key messages to communicate that:

- the approach conveys more positive messages than the usual health and safety guidance and contains 'how to' information to make health and safety improvements, making it clear that the toolkit is there to help SMEs rather than to impose new restrictions;

- it does not need to take much time; SME leaders can pick and choose from the array of tools and associated guidance provided to suit their needs;

- it contains useful information that SME leaders can use to engage with site operatives, subcontractors and the supply chain on health and safety matters;

- it can serve a variety of purposes such as making positive improvements to workplace health and safety attitudes/behaviours, and to benchmark progress with the caveat that it does not replace regular compliance duties;

- it contains links to other relevant information sources and, ideally in the future, with construction accreditation schemes; and

- it can bring about quick wins and long-term gains as demonstrated through practical examples provided by other SMEs using the toolkit (through potential future case studies).

The findings from this project have provided useful insights into how best to communicate with SMEs that may be relevant to other projects. Most noteworthy is the need to be innovative during communications. Any future guidance or tools should also be as visual and interactive as possible to engage SMEs whilst not taking too long to complete. Simple instructions and take home messages are essential. Evocative personal testimonies offer a strong vehicle for conveying the moral argument, but should be used sparingly to promote maximum impact. Of critical importance is demonstrating the 'what's in it for me' case to SMEs to show how they could benefit from involvement. In addition, the involvement of SMEs from the outset ensures that products developed are fit-for-SME purpose. Use of a website enables structuring of the tools and guidance in a way that conceals the complexity of LWE to SMEs. Users can access further information should they wish to, but are not immediately presented with this. This enables a good balance to be achieved between usability and the scientific integrity of the toolkit.

2.2 APPLICABILITY OF THE TOOLKIT TO OTHER INDUSTRIES

Whilst grounded in the construction sector, the toolkit appears to have read across to other sectors. This is because the guidance and tools contained within it are designed around best practice for LWE and therefore aim to help leaders to communicate better with their workforce and improve their own leadership skills. The necessity to improve worker engagement and the quality of leadership does not appear to be an issue for construction alone, and seems to be the foundation for making health and safety improvements as recommended in other research in different sectors [6, 7]. Although the examples cited throughout the toolkit are specific to construction, with appropriate tailoring, it could fit any industry. In addition, phase III findings have illustrated the toolkit's appeal to large companies, not just SMEs. Further work is necessary, however, to ensure that 'health' aspects are adequately covered in the toolkit as this could impact on its applicability to sectors where health concerns are paramount.

[7] *A forum for members (mostly large construction companies in the UK) to share best practice and consider possible solutions for common safety, health and environment issues across the construction industry.*

2.3 EVALUATING THE EFFECTIVENESS OF THE TOOLKIT

It is strongly recommended that HSE put strategies in place to evaluate the effectiveness of the toolkit once launched. This will help to keep the toolkit 'live' (up-to-date and relevant). As suggested by participating companies in this project, this could take the form of case studies following SMEs that are using the toolkit and documenting the benefits accrued, which could inform ongoing promotion of the toolkit. This evidence would also help to balance the positive (benefits) and negative (consequences) messages in the toolkit and therefore is critical for ongoing development of the business case. For optimal results, a baseline measure needs to be obtained of current LWE levels regarding health and safety (e.g. through use of the HSDT to benchmark progress) before use of the toolkit. This qualitative approach coupled with quantitative data collection (e.g. number of web hits, etc) seems to hold most promise for producing reliable estimates of the effectiveness of the toolkit. Should formal impact evaluation be untenable, a feedback mechanism could be added to the LWE toolkit website as a user satisfaction measure.

3. METHODOLOGY

3.1 PHASE III OVERVIEW

Three overlapping work streams (A-C) were carried out simultaneously in three stages starting with initial development through to final testing and refinement of the toolkit (see Appendix 2). This took place over a two-year period. Each work stream corresponded to the three primary objectives of phase III (as outlined in section 1.2). Details of the design, sample and data analysis for each work stream in turn is provided in the sections that follow.

3.2 WORK STREAM A - DEVELOPMENT OF THE WEB-BASED TOOLKIT

3.2.1 Design

3.2.1.1 Approach taken

The approach adopted to develop the toolkit as a web-based application followed established human factors principles. Recognising that the content of the toolkit needed to be consistent with users' natural mental models [8], the orientations and prior understandings of LWE amongst leaders were established at the outset. During development, ongoing feedback was obtained from construction leaders, mostly SMEs. In addition, the views of the principal contractors involved in phase I of the project were continually sought during biannual LWE Forum[8] meetings between the construction industry and HSE. This user-focused approach prevented software development potentially taking precedence over the needs of SME leaders and increased the likelihood of:

- SME leaders finding the toolkit manageable through use of simple messages about what they should and should not be doing and specification of key tools;
- the toolkit containing all the necessary information and tools that SME leaders need to improve their LWE practices framed in an appropriate language that is readily understood by SMEs;
- SME leaders finding solutions tailored to their particular circumstances; and
- leaders having positive interactions with the toolkit, being satisfied with the system overall and committed to its ongoing use [9], which could promote wider uptake of the toolkit.

3.2.1.2 Stages of development

(*1) Production of the skeleton toolkit and testing through user needs workshops*

Production of the skeleton toolkit. The content of the toolkit developed in phase II was used as a basis for developing a simplified (skeleton) version of the toolkit. This offered SME leaders the choice of either carrying out the bare minimum to make improvements or adopting a more comprehensive approach through use of the full toolkit to be developed in the next stage. The skeleton toolkit consisted of eight webpages (as shown in Figure 2), one for each step of the toolkit, and an initial webpage with links to instructions and the slide show to motivate leaders. The full skeleton model can be found in Appendix 3.

[8] *A forum for members (mostly large construction companies in the UK) to share best practice and consider possible solutions for common safety, health and environment issues across the construction industry.*

User needs workshops. Two four-hour workshops were conducted in December 2009. These explored whether the skeleton toolkit met leaders' needs beyond those involved in the phase II feasibility testing. The workshops began with a one-hour focus group to gain a clear picture of what was correctly understood about LWE and what was unclear or misunderstood. Focus groups were selected at this early stage to obtain a breadth of views from construction leaders in different work areas. The second part of the workshops consisted of a technical session lasting up to three hours to elicit leaders' views of the skeleton toolkit (e.g. whether it met their needs, if the navigation was understood and what, if anything, needed to be added to the toolkit). Participants were divided into small groups and given access to the toolkit on a laptop. All participants completed a short questionnaire at the end to capture further insights into the utility of the toolkit (i.e. which aspects are most helpful, what else should be added, intended future use of the toolkit and preferred means of access). Researchers subsequently worked closely with the web developers to firstly, refine the skeleton toolkit where the majority of participants had suggested changes and secondly, to populate the remainder of the toolkit (Further Tools section).[9]

(2) User trials (to test the full toolkit with researcher present)

The full toolkit was tested during user trials with six construction companies (Apr - Jun 10) held on company premises. In a one-to-one session with a researcher (lasting up to three hours), participating leaders were asked to explore the toolkit on a laptop and to verbalise their thoughts. In line with the mental models approach, this ensured that the trials were user-led to protect against the researcher unintentionally influencing how participants' interacted with the toolkit. The researcher observed whether leaders intuitively followed the seven steps to LWE and captured their comments on a standard proforma. The same process was followed for the construction workers invited to review the pages that had been developed for the workforce.

The full toolkit was refined in light of the changes that emerged from the first two trials. This enabled researchers to take stock of emerging issues in order to identify when saturation[10] had been reached in the subsequent (planned) four trials. Saturation was achieved after five trials. Nevertheless, a sixth trial was carried out to test The Top Ten Safety Risks Tool (Key Tool) in Step 3, previously under development. The manager in this trial was asked to spend more time reviewing this tool than other parts of the toolkit.[11]

(3) Independent Usability testing (the full, revised version of the toolkit)

To explore how leaders would use the toolkit in practice, the full version was further tested with five construction companies. Participants were emailed the link to the live toolkit and asked to use this in their respective organisations over a two-month period (Aug - Sep 10). They were also provided with relevant documentation to record any technical glitches or aspects they did not find useful or understand. Upon completion of the independent testing, semi-structured interviews were carried out with leaders individually to obtain feedback on the toolkit and, importantly, whether they had acted on learning or intended to soon.[12]

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[9] *Further details on the methodology and associated tools are documented in an Annex report (WPS/11/37(A)), available from HSL on request.*

[10] *i.e. no further new information on improvements needed to the toolkit.*

[11] *Further details on the methodology and associated tools are documented in an Annex report (WPS/11/37(A)), available from HSL on request.*

[12] *Further details on the methodology and associated tools are documented in an Annex report (WPS/11/37(A)), available from HSL on request.*

3.2.2 Participants

An opportunistic sample of participants was recruited through LWE Forum contacts and a recruitment agency. The same sampling strategy used in phase II was followed using the criteria: (a) an 80/20 representational split of leaders belonging to SMEs (with up to 249 employees) and large companies (with over 250 employees); and (b) companies operating in five areas of construction; (i) Demolition/Site Clearance, (ii) Design/Build, (iii) Structures, (iv) Ground Works and (v) Mechanical/Electrical.

User needs workshops. These involved 16 health and safety managers (eight per workshop), 12 SMEs and four large companies. A £50 voucher was included as an incentive to participate.

User trials. These involved six health and safety managers, five SMEs and one large company. Five volunteered to take part in the user needs workshops and the sixth was recruited through the LWE Forum. Four workers participated in the first four trials (one per company). This was not possible in the last two trials in which managers reviewed the worker webpages. It was reassuring that the views given by the two managers were consistent with those of other workers suggesting that specific comments or concerns had been captured.

Usability testing. This involved five health and safety managers, four SMEs and one large company. Due to an unforeseen personal circumstance, a recruited sixth participant withdrew. All five managers had been involved in at least one aspect of toolkit development in phase II or phase III. The user trails revealed that construction workers are unlikely to use the toolkit (i.e. the pages design specifically for workers) unless they had been assigned health and safety responsibilities. Workers were therefore excluded from the testing process.

Whilst only a small number of leaders participated in each stage of development of the web-based toolkit, taken together this amounts to input from **17 companies (13 SMEs) in phase III**. This excludes the additional 119 companies that participated in testing/refining the HSDT – see section 3.4.2). Conducting testing at the various time points with a small sample of companies enabled rich data to be gathered about the usefulness of the toolkit for their specific context through the one-to-one feedback sessions with leaders. Such in-depth involvement by SMEs in both the user trials and usability testing could be impractical with a larger sample.

3.2.3 Data analysis

User needs workshops and user trials. Both involved two researchers independently conducting thematic analysis on half of the data and extracting the necessary changes to the toolkit. Thematic analysis is a method for identifying patterns (themes) within data. It organises and describes data set in (rich) detail and is also used to interpret various aspects of the research topic [10]. This was considered the most relevant method for gaining an in-depth understanding of participants' perceptions and opinions, and for exploring any similarities and differences between participants. Researchers met to agree both the themes and the changes. Changes were suggested to the web developers where several participants mentioned the same issue or if these were of value to the construction industry. The latter was determined through conversations with key project stakeholders.

Usability testing. A sole researcher extracted themes that emerged across participants relating to the constituent facets of the questionnaire and interview schedule. A second researcher crosschecked this. A comparison of data gathered from both sources enabled greater clarity over the key technical and content issues that needed to be addressed.

3.3 WORK STREAM B - DEVELOPMENT OF THE SLIDE SHOW TO MOTIVATE LEADERS

3.3.1 Design

3.3.1.1 Approach taken

Phase II feasibility testing results were used as a basis for determining how to present the business, legal and moral case to motivate SME leaders to use the toolkit. Three key themes emerged during phase II, namely, the need: (1) for visual presentation of the messages with less text, (2) to simplify the messages with, and (3) to have less emphasis on statistical data. As such, the decision was made to frame the messages as a collection of around 30 slides. Liaison with the web developers reinforced the decision to use headline messages (as in news stories) and paraphrases of key messages distilled from research findings and company case studies. To have maximum impact, audio and video testimonies were included. Previous research has highlighted the power of evocative testimonies as a means to engage dutyholders in health and safety matters [1]. Participants in the user needs workshops in work stream A also supported the use of such footage. This approach is consistent with recommendations of other research on optimising communication with SMEs [11].

3.3.1.2 Stages of development

Figure 3 summarises the four stages of development of the slide show undertaken during work stream B. Consistent with other work streams, development was user-led rather than researcher-led.

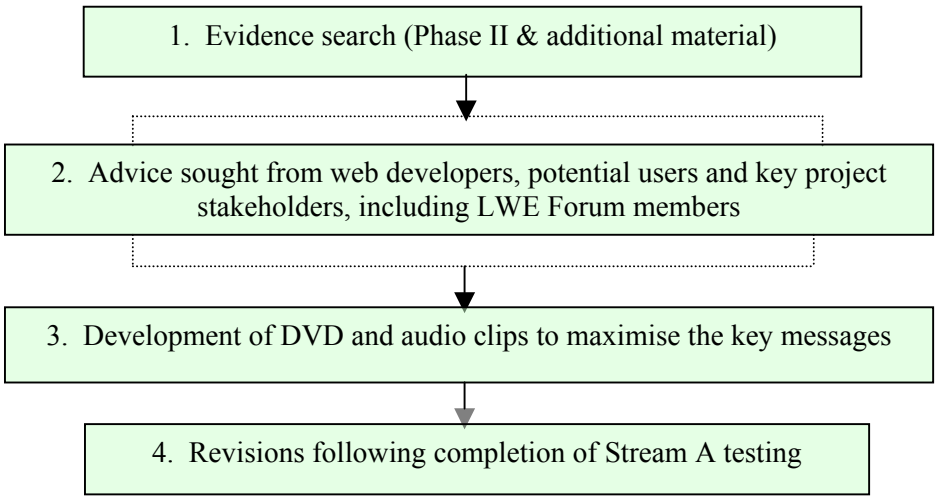

Figure 3 Development process of the slide show

1. Evidence search. Key messages were extracted from the phase II literature reviews on the potential business benefits of LWE and the legal and moral responsibility of dutyholders [1]. Other sources included: the HSE intranet/internet for information on worker engagement; HSE press releases on successful prosecutions[13]; the Crown House Technologies case study[14]; information supplied by HSE's Head of Health Risk Management Unit to include material on 'health', as well as safety; and relevant quotations from the McLeod Report [12].

2. Sources of advice. In addition to liaison with the web developers, ongoing feedback was obtained from SME leaders in work stream A testing (see section 3.2) and project stakeholders.

[13] *See Hwww.hse.gov.uk/press/2009/*
[14] *See Hwww.hse.gov.uk/construction/engagement/crown-house-technologies.pdf*

3. Development of DVD and audio clips. To maximise the impact of the business, legal and moral messages, a DVD produced by Latitude Productions Ltd of a widow whose husband was killed on a construction site was included in the slide show. In addition, two audio clips of short (telephone) interviews with two LWE Forum members were included about their own experience of engaging with LWE. One focused on the moral justification for adopting LWE and the second on the business benefits accrued.

4. Revisions. The slide show was revised iteratively in light of ongoing feedback from project stakeholders and the SME leaders that participated in work stream A testing (all stages).[15]

3.4 WORK STREAM C - RELIABILITY AND VALIDITY TESTING THE HSDT

3.4.1 Design

3.4.1.1 Approach taken

Given the importance of the HSDT as a diagnostic measure of health and safety culture, it is vital to examine its psychometric properties. If these are below the standard accepted in conventional test design [13], there is the danger that SME leaders will be erroneously guided. Of critical importance is that the tool (i) provides an accurate measure of health and safety culture (i.e. it is **valid**), and (ii) produces results that are not affected by people, time or place[16] (i.e. it is **reliable**). Whilst some basic testing occurred in Phase II[17], such a small sample did not permit accurate conclusions to be drawn about its validity or reliability. For this reason, phase III included an in-depth assessment of the measure's validity and a robust assessment of its reliability.

3.4.1.2 Stages of testing

Validity and reliability testing was carried out simultaneously with the paper version of the HSDT as the web version was under development. The perceived usefulness and usability of the web version was tested during work stream A.

(1) Validity testing. Feedback was collated from subject matter experts over a six-week period (Oct - Nov 09). Views were sought primarily on whether the statements that described each facet of health and safety culture[18] were comprehensive, and if the resulting solutions (to help users progress from their current level of maturity to the next level up) accurately portrayed each level of maturity. Part of the testing involved an internal (HSL) peer review of the tool. Two researchers jointly reviewed all feedback and refined the tool accordingly.

(2) Reliability testing. Reliability testing took place between October and December 2009. To promote consistency between testing sessions, researchers followed a standard administration process (see Appendix 4). Participants completed the HSDT at two time points (test-retest reliability). A minimum of a two-hour gap between Time 1 and Time 2 was considered sufficient to allow for memory fade. Leaving longer than a day may have biased the results (e.g. other organisational changes may have impacted leaders' perceptions of their health and safety culture). Gathering this data also enabled internal consistency testing to be carried out

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[15] *Further details on the methodology and associated tools are documented in an Annex report (WPS/11/37(A)), available from HSL on request.*

[16] *i.e. the same results would be obtained from the same person completing the measure at different times/places.*

[17] *Consultation with internal (HSE/HSL) subject matter experts (face validity) and test-retest reliability with ten LWE Forum members.*

[18] *(1) Commitment, (2) worker engagement, (3) prioritisation of health and safety, (4) motivation to comply, (5) measurement and (6) organisational learning.*

(i.e. checking for consistency between the statements that describe each facet of health and safety culture).

All responses were anonymous and number coded to enable comparison of Time 1 and Time 2 responses, as well as participant withdrawal.

(3) Additional reliability testing. To check whether the changes made as a result of the validity and reliability testing had affected the interpretation of the items measuring the six facets of health and safety culture, an exercise was conducted with LWE Forum members[19]. This confirmed the change in meaning of a few items. As such, further reliability testing was conducted (Mar - Jul 10). The same administration procedure was followed.

3.4.2 Participants

(1) Validity testing. Six experts were invited to participate via email and sent supporting documentation (information letter, HSDT and a Validity Response Form). Three HSL colleagues, not involved in the project, were also asked to peer review the HSDT. Whilst the overall sample was relatively small, all participants were subject matter experts in organisational culture and carried out a thorough assessment of the tool (covering face and content validity). Saturation was achieved (i.e. the same themes emerging across experts), suggesting that the sample size was sufficient.

(2) Reliability testing. An opportunistic sample of 80 Health and Safety Managers (or those responsible for health and safety) belonging to different companies and industries was recruited. Given that the HSDT is a generic health and safety culture tool applicable to any industry, companies from all sectors took part. Participants were recruited via three methods: (1) approaching delegates attending HSL training courses, (2) asking leaders attending the user needs workshops in work stream A, and (3) through company visits[20] made by HSL's Occupational Hygienists, all fully briefed on the administration procedure. An opportunistic sample of 55 delegates attending HSL training courses was obtained for carrying out further reliability testing.

135 companies took part in validity and reliability testing the HSDT. This includes the 16 that took part in the user needs workshops in work stream A (119 new companies). Involving the 16 companies from work stream A was considered valuable as these users could see how the measure fitted into the wider toolkit.

3.4.3 Data analysis

(1) Validity testing (qualitative analysis). Comments collated from subject matter experts and HSL peer reviewers were transferred into a spreadsheet structured according to the constituent facets of the Validity Response Form. Two researchers looked across participants' data to discern and agree the necessary refinements. A third researcher crosschecked these.

(2) Reliability analysis (quantitative analysis). All data gathered during Time 1 and Time 2 was input into SPSS[21]. Reliability was examined through calculation of the Cronbach's Alpha statistic as a measure of internal consistency and the Pearson's Product Moment Correlation as a measure of test-retest reliability. The criteria for acceptability was set at the standard level of at

[19] *Members were asked to compare the original (pre-testing) HSDT with the revised (post-testing) version to determine whether the meaning of the statements describing the different facets of health and safety culture had changed.*
[20] *These were project-based visits, not visits to companies undergoing HSE enforcement.*
[21] *Statistical Package for the Social Sciences (SPSS)*

least $\alpha = 0.70$ [14] and $r = 0.70$ [15] respectively. Individual item (Chi^2) analysis was also conducted to closely examine the pattern of responses between Time 1 and Time 2. All written feedback recorded by researchers was qualitatively reviewed.[22]

[22] *Further details on the methodology and associated tools are documented in an Annex report (WPS/11/37(A)), available from HSL on request.*

4. RESULTS

Key findings relating to each work stream (A-C) are presented in turn:

- Work stream A summarises the feedback obtained from construction leaders (mostly SMEs) at key points during the development of the web-based toolkit (user needs workshops, user trails and usability testing). Due to the general consistency in the feedback obtained at each testing stage, the key findings from all stages of testing have been amalgamated.

- Work stream B provides an overview of the feedback obtained for the slide show from LWE Forum members and from the leaders that participated in stream A testing.

- Work stream C describes the validity and reliability outputs with the opportunistic sample of companies, which includes participants from work stream A user needs workshops.[23]

4.1 WORK STREAM A – INDUSTRY FEEDBACK

Key themes and sub-themes that emerged from the three testing sessions (user needs workshops, user trials and usability testing) are summarised below. These have been taken from Appendix 5, which presents all themes and associated findings for each testing session.[24] Due to time and budget constraints, it was not possible to provide verbatim data from the feedback sessions (focus groups and interviews), as no transcript was available. As such, there are few direct quotations taken from participants, and their feedback has been summarised. Any quotations included are taken mostly from the usability testing where participants recorded their responses on a feedback questionnaire.

4.1.1 Attitudes towards and motivation to use the toolkit

In general, the toolkit was positively received and considered to be a "*valuable asset*" for construction SMEs. Participants were of the opinion that there was nothing similar currently available. Unlike the traditional, statutory health and safety guidance, the use of positive messages that were neither intimidating nor aggressive appealed to SME leaders. This approach, in conjunction with the toolkit's focus upon behaviour change strategies (i.e. motivation, communication, instigation, training and maintenance), was felt to be innovative. Participants were enthusiastic about using the toolkit and felt that other construction SMEs would generally feel the same. The toolkit was thought to serve a variety of purposes including engagement of staff, subcontractors and the supply chain, promotion of a positive health and safety culture and a means to benchmark progress. The added value dimension was considered to be its prescriptive nature i.e. not only explaining what the issues are, what needs to be done and why, but importantly, *'how to'* develop good LWE with simple tools and techniques provided.

"You can do it in sections and there are prompts for further information. It takes away the - I don't know where to start."

[23] *Further details on the results relating to each work stream are documented in an Annex report (WPS/11/37(A)), available from HSL on request.*

[24] *Full details of the results for the user needs workshops, user trials and usability testing are documented in an Annex report (WPS/11/37(A)), available from HSL on request.*

4.1.2 Current use and understanding of LWE in SMEs

Differing levels of awareness were apparent amongst SMEs about what LWE constitutes and involves. Those with better knowledge had adapted behavioural safety programmes from large construction companies. Learning from larger, generally better performing, companies seems to be an effective model for cascading good practice to SMEs in construction, which is the model that this toolkit is based on [1]. Most participating SMEs were involved in worker engagement activities, but seemed unaware of this. For example, they did not consider toolbox talks to be worker engagement. Conversely, there was a tendency for leadership practices to be overlooked despite awareness that managers at all levels were failing to lead by example. Step 4 of the toolkit ('Lead This In Your Company') was therefore well-placed to assist SME leaders with developing their leadership skills, particularly communication aspects.

4.1.3 SME needs for the functionality and content of the toolkit

A number of needs for the toolkit were identified through the testing process, particularly during the user needs workshops at the start of phase III. These 'needs' mostly related to the desired content and how the toolkit would operate to optimise usability, and are consistent with those identified in phase II of the project (literature reviews and interviews with SMEs; 2]). Table 1 summarises these requirements and illustrates whether or not these were accomplished. It is apparent from Table 1 that, on the whole, the toolkit met SME needs. Participants felt that the involvement of SMEs throughout the development process had paid off in terms of creating a usable toolkit. The seven steps to LWE were favourably received and adhered to by the majority of participants. All steps were considered to contain the right amount of tools and *'how to'* guidance.

"I feel the toolkit is [an] excellent step-by-step process to help SMEs and, to be honest, even larger organisations. I feel good research has been carried out to get the kit to this stage and it has been great to work with it during this consultation/trial stage."

Participating leaders found the toolkit intuitive to use and welcomed the broad mix of guidance, templates, interactive tools, and training with the option of completing the Key Tools as a minimum. Leaders of small companies particularly liked the Key Tools. The interactive and visual premise to the toolkit was felt to boost its usability in comparison to a paper-based version. Interactive tools were thought to be very powerful and user-friendly, in particular, the Top Ten Safety Risks Tool, HSDT, Leadership Check Tool and Competency Tool.

"The tool is very understandable and the way it works makes it very easy to complete." [HSDT]

"Excellent video clip in easy to understand language. The 10 risk behaviours support the video clip and give the user an insight into real safety issues and how they can be avoided." [Top Ten Safety Risks Tool]

Worker webpages. Inclusion of worker-specific webpages were thought to be valuable for encouraging workers to become involved in health and safety improvements, mentioned by the majority of leaders as a necessity for construction sites. The practicalities of the working day for construction workers, however, were considered to hamper use of these pages.

I can't imagine a bricky logging on in the evening rather than going to You Tube or Face Book."

Whilst positive about them overall, the workers that participated in the user trials gave an honest view that they would not seek out this information and felt that the same was true of their colleagues. Use in Toolbox Talks or other training was considered more appropriate.

E-version of toolkit. Whilst participants preferred electronic access to the toolkit through the HSE website, they acknowledged that very small companies may not access this. SME leaders emphasised throughout the testing process that consideration needs to be given to how to market this toolkit to small construction companies that may not be aware of its existence.

Table 1 SME needs for the functionality and content of the toolkit

		Supporting evidence
Engagement with SMEs during development process to ensure that the toolkit is as SME friendly as possible	√	SMEs consulted during key development points
Initial focus of the toolkit should be on getting senior management buy-in	√	Slide show was considered a powerful way to convey important messages to motivate SME leaders "*Straight to the point, not too much information per slide*."
A simple, step-by-step process to follow	√	Generally liked the design, structure and layout of the toolkit. Adherence to the seven steps to LWE as advocated and understood the reason behind the Key Tools (i.e. the minimal requirement), attractive to small companies
Highly prescriptive with no room for interpretation	√	Noted the value of the tools/guidance for explaining '*how to'* create change
Explanation of management duties in relation to LWE and how to achieve these	√	Clear explanation of LWE and supporting behaviours with all necessary guidance for managers were felt to be included
Visual aids, sound bites and interactive tools	√	Included pictures, DVDs and soundbites were well-received Interactive tools, such as The Top Ten Safety Risks Tool, the HSDT, the Leadership Check Tool and the Competency Tool were favoured *"If I had completed the questions and my results had been in the red section it would make me want to do something about it!"* [HSDT] "*Provides a gap analysis and the basis of an action plan for improvement,"* [HSDT]
Easy and efficient navigation	√	Found the toolkit easy to use. Some technical faults highlighted
Eye catching and easy to understand homepage	√	Participants understood where to go first unprompted by researchers "*The homepage was easy to understand and all elements within it clear and concise."* *"I think if I owned my own small building company and I had heard*

		about the toolkit - having viewed the homepage I would want to know more."
A broad mix of guidance, templates, training, interactive tools and DVDs	√	Felt that a balance had been struck between providing necessary information whilst not overwhelming users *"Information is all there to use as little or as much as you want."* Templates offered a starting point for SMEs and pointed leaders in the right direction
Instruction on how to change worker attitudes/behaviours	√	Worker engagement guidance and tools were considered to be comprehensive
How to implement a 'stop work' policy	√	Participants liked the guidance on 'Stop!' in Step 6 ('How your team can carry it out')
		The toolkit is framed as a means of improving both health and safety, but participants acknowledged the emphasis on safety. As such, added examples should to have a health focus
Include key do's and don'ts	√	This is included in Step 7 ('Make it last') as tips for maintaining change over time
Include training matrix templates	√	Those included as part of Step 6 ('How your team can carry it out') were considered to meet SME needs
Downloadable Word than PDF documents to enable tailoring	√	Word documents developed and clearance to use on HSE's website
Relevant information for workers using simple language	√	Relevant (e.g. SLAM, assertiveness skills) and easy to understand, but questioned whether workers would use these on their own volition
How to get workers to stop work in unsafe situations	√	The presentations showing serious injury or loss of life were felt to assist with getting workers involved in the implementation of safe practices
		Not fully achieved in phase III, but the LWE Forum plan to do road shows to promote and explain the toolkit to construction SME leaders Participants also suggested SME Forums to discuss best practice, workshops and SHADs
		Not included for fear of SMEs thinking that following the toolkit

		fulfils all their health and safety duties. However, this is a useful consideration for rollout to promote uptake of the toolkit Participating SMEs suggested a certificate of completion or accreditation (e.g. CHAS) for using the toolkit
		Not a component of phase III, but important for rollout of the toolkit

Considerations for further development. At the end of the last round of testing (usability trials), very little further development of the toolkit was considered necessary. A couple of suggestions were made to (1) install email reminders as prompts to continue use (e.g. to redo the HSDT after 6-12 months), and (2) to standardise and reduce the volume of text in the downloadable information sheets. Whilst the downloadable information sheets have been condensed, email reminders have not yet been installed in the HSDT. The HSDT does contain the facility, however, to email the results to a forwarding email address. Table 1 highlights four additional requirements that were not completely accomplished in phase III. Firstly, the inclusion of practical examples (or case studies) demonstrating how other companies, particularly SMEs, had applied the toolkit. Secondly, including health as well as safety guidance was deemed important to help SMEs with making health improvements. Thirdly, the inclusion of a tracking document or some form of evidence of having completed aspects, if not all of, the toolkit was sought by SME leaders. Finally, a support mechanism, ideally through liaison with large construction companies, was considered necessary to ensure that SME leaders had a source of advice when using the toolkit.

4.1.4 Benefits to using the toolkit

In general, participants were confident that other SMEs using the toolkit would reconsider their health and safety practices to reduce risk-taking behaviour. SME leaders that participated in the usability testing reported a very positive and beneficial experience from using the toolkit over the trial period. Whilst a short (eight week) period was not enough to notice the true benefits of initiating health and safety improvements, some quick wins were noted. These included:

- a better understanding of what good practice would look like and the actions that leaders can take to improve health and safety performance;
- feeling more confident at implementing a behavioural safety action plan;
- positive feedback from workers and the supply chain that the worker webpages were interesting and useful; and
- a means of checking whether existing behaviour change initiatives were taking the right approach while uncovering additional aspects that could be improved.

An example of how the toolkit helped to improve healthy and safety in one SME:

Use of The Top Ten Safety Risks Tool (Step 3) made one participant aware that incidents involving dumper trucks were listed in the Top 10 construction fatalities. He identified poor practice on his sites and talked directly to site operatives, challenging poor practice when he observed it and justifying his reason for doing so (i.e. to avoid any fatalities). He reported being more confident when challenging workers/supervisors as he could justify his approach through knowledge that dumper trucks are in the Top 10 fatalities. This knowledge has been cascaded to managers/supervisors and plans have been made for a toolbox talk on this topic.

4.1.5 Anticipated uptake and use of the toolkit amongst construction SMEs

SME leaders who participated in the usability testing commented that they would use the toolkit on site and anticipated doing so once it had been launched, confident that it would work. Participants were also of the opinion that they (and other SMEs) would use the toolkit with new managers/supervisors and refresh this learning every six to 12 months as well as using the

toolkit as a point of reference when required. After examining it initially, SME leaders thought that the toolkit would be used for several hours a fortnight/month.

"I will definitely use the toolkit as I think it is an excellent way to monitor step-by-step along the way how we are doing."

A consistent finding emphasised by most participants across all testing sessions was the need to effectively market the tool to construction SMEs. Getting SMEs to access the toolkit and start using it was considered to be the principal barrier to widespread uptake. Several key messages were suggested to help overcome this barrier, namely, (1) that '*good health and safety is good for business'* and '*vital for winning work'*, (2) stressing the *'how to'* nature of the toolkit, and (3) benefits of its use. Participants felt that SMEs needed to be aware that the toolkit does not cover their compliance duties. Rather, the toolkit is a way of improving general health and safety performance through strong leadership and worker engagement. Suggested methods of communication included poster campaigns, radio adverts, emails through HSE's mailing list, presentations at safety group meetings/forums, trade journals, use of CITB-ConstructionSkills[25] and the Federation of Small Businesses.

"*I think once other SMEs saw how useful the kit had been to others they would definitely use it."*

4.2 WORK STREAM B – INDUSTRY FEEDBACK

4.2.1 Feedback from LWE Forum members

Initial feedback from LWE Forum members suggested several amendments to the slide show, all of which were made. Key amendments concerned presentation of the key messages and recommendations of further evidence to incorporate, namely:

- to reduce the text on some slides for a coherent array of simple and catchy messages;
- to move the slides on LWE and the difference that it can make to the front of the slide show, finishing with the same message;
- to add an additional slide to introduce the legal case titled 'The price of getting it wrong' and integrate information on health risks;
- to incorporate Laing O'Rourke's work for the height/workforce engagement case study at Crown House Technologies and inclusion of the Health and Safety Offences Act; and
- to include a slide on 'What your insurance does not cover when there is an accident' as forum members thought that SMEs might be unaware of this.

4.2.2 Feedback from stream A constructions leaders

Findings from the work stream A testing revealed that, overall, the use of the legal, moral and business case was regarded as a powerful way of securing management buy-in and motivating SME leaders to implement LWE. It emerged as one of the preferred aspects of the toolkit and was thought to be relevant to the industry and a good way to drive key messages home.

"*Straight to the point, not too much information per slide*."

[25] *Construction Industry Training Board (CITB).*

Relatively few minor changes were suggested throughout the testing process. These mostly concerned: striking the right balance between the views of managers and workers and the portrayal of negative facts with positive facts to avoid motivating from a fear perspective; the inclusion of more information on the financial benefits, talking heads and construction photographs; and resolving technical issues related to downloading links and DVDs. One recommendation in the stream A usability testing for future consideration concerns the addition of case studies to emphasise the benefits of using the toolkit in the slide show. Participants felt that there was too much focus currently on the consequences of poor health and safety management than the benefits and case studies would help to balance this out.[26]

4.3 WORK STREAM C – VALIDITY AND RELIABILITY RESULTS

4.3.1 Validity results

Overall, comments from participating experts were positive; they considered the HSDT to be a good indicator of health and safety culture maturity. The six facets of health and safety culture[27], referred to in the tool as 'building blocks', were considered appropriate. Suggestions made to improve the tool mostly concerned clarity in the instructions and phrasing throughout. Key changes to the technical content of the HSDT included:

- inserting definitions for each building block, clearly distinguishing health progression from safety progression[28];
- making clear the need for a partnership approach to worker engagement in high maturity statements, ensuring that the statements describing differing levels of maturity are mutually exclusive and that the *'how to'* (make change) was clear in the solutions; and
- renaming the 'planning and organising' building block to 'compliance' as the statements did not cover all necessary aspects of health and safety planning, which could constitute a measure in itself.

Revisions were made to the HSDT in light of expert feedback. Similar findings were obtained from the internal (HSL) peer review, with two additional suggestions: firstly, to clarify 'who' should complete the tool and secondly, to acknowledge that it might be used differently in large companies than in SMEs. Subsequent changes were made to the instructions.

Perceived applicability of the HSDT to other sectors:
Five of the six experts felt that the HSDT could be applied to other industries and put forward several suggestions to facilitate this, namely, some slight tailoring of the tool to suit individual industry needs and culture (e.g. differing levels of emphasis on health versus safety depending on the sector).

[26] *Full details of the results are documented in an Annex report (WPS/11/37(A)), available from HSL on request.*
[27] *(1) Commitment, (2) worker engagement, (3) prioritisation of health and safety, (4) motivation to comply, (5) measurement and (6) organisational learning.*
[28] *Safety tends to be the focus in less mature companies.*

4.3.2 Reliability results

4.3.2.1 First round of testing

Seventy-nine participants from a wide range of industry sectors, predominantly construction (n=17) and manufacturing (n=14), completed the HSDT at Time 1 and Time 2[29]. Data collated met the assumptions to proceed with correlation analysis[30].

Internal consistency. The Cronbach's Alpha statistic was .787 and .847 for Time 1 and Time 2 respectively. This is an acceptable standard and demonstrates a high level of consistency between the six items that describe each building block, providing some support that the tool is a reliable measure of health and safety culture.

Test-retest reliability. Results are summarised in Table 2. Evidently, four of the six building blocks met the required standard (r = 0.7). Whilst significant, the remaining two building blocks ('worker engagement' and 'planning and organising'[31]) were slightly below par. Such variability in participants' responses between Time 1 and Time 2 calls into question the reliability of these two building blocks. Individual item (Chi²) analysis highlighted that a small number of participants (n=11 of 135) responded differently between occasions. One explanation for this difference is the potential effect of the health and safety training that the majority of participants were undertaking at the time (e.g. realisation through the acquisition of new knowledge that their health and safety standards were better or worse than originally thought). Alternatively, participants may have simply misinterpreted the statements. Feedback from LWE Forum members also supported the need for further testing (see section 3.4.1.2).

As a precautionary measure, a second round of reliability testing was conducted with the updated version of the HSDT upon completion of the validity testing[32].

Table 2 Pearson's product moment correlations for the HSDT for the first round of testing

			Probability
Commitment	r = 0.739	79	p = 0.01
Worker engagement	*r = 0.515*	*79*	*p = 0.01*
Prioritisation of health and safety	r = 0.723	79	p = 0.01
Organisational learning	r = 0.768	79	p = 0.01
Planning and organising	*r = 0.615*	*79*	*p = 0.01*
Measurement	r = 0.782	79	p = 0.01

4.3.2.2 Second round of testing

Internal consistency. Similar results were obtained to the first round of testing (r = 0.794 and r = 0.840) for Time 1 and Time 2 results respectively.

Test re-test reliability. Fifty-three participants from a wide range of industry sectors, predominantly manufacturing (n=12)[33], completed the updated version of the HSDT at Time 1

[29] *One participant was removed due to an incomplete HSDT at both time points reducing the sample from 80 to 79.*
[30] *i.e. normality, linearity, absence of outliers, level of data.*
[31] *The HSDT tested at this stage was the version before any changes were made following the validity testing hence this building block had not yet been renamed to 'compliance'.*
[32] *See Hsection 4.3.H1 for changes made post validity testing. Statements were also amended to improve clarity, differentiation and remove ambiguity following the first round of reliability testing.*
[33] *Other industries, including construction, averaged three participants.*

and Time 2[34]. Although these data were slightly skewed[35], correlation analysis was deemed robust enough to accommodate this [16]. Prior to calculating the test-retest reliability, individual item (Chi²) analysis was conducted on the two building blocks ('prioritisation of health and safety' and 'compliance'[36]) that produced sub-standard results in the first round of reliability testing. Five outlier (extreme) cases were removed due to marked differences in responses between Time 1 and Time 2. As all participants were attending health and safety training at the time of completing the measure, the influence of the training on responses looked more probable than in the first round of testing. Statistical guidance on outliers justified the decision to remove the five cases [17]. The results are shown in Table 3.[37]

Table 3 Pearson's product moment correlations for the updated version of the HSDT

			Probability
Commitment	r = 0.781	52	p = 0.01
Worker engagement	*r = 0.744*	*53*	*p = 0.01*
Prioritisation of health and safety	r = 0.883	53	p = 0.01
Organisational learning	r = 0.819	53	p = 0.01
Compliance	*r = 0.792*	*52*	*p = 0.01*
Measurement	r = 0.855	49	p = 0.01

Is the HSDT valid and reliable?

Based on the findings from the testing conducted to date, **the reliability and validity of the HSDT is acceptable.** It was obvious to participants and experts that the tool is a means of diagnosing health and safety culture (i.e. it has 'face validity'). The statements measuring each building block appear to cover the facets underlying health and safety culture (i.e. it has 'content' validity). The tool also contains statements that are consistent with one another and generate the same measurements from one occasion to another and (i.e. it is reliable). Whilst the validity testing was not ideal due to being based on qualitative rather than quantitative analysis, it should be borne in mind that no other tool was found that provides quick and simple health and safety cultural diagnosis to enable a robust comparison (or 'construct' validation).

4.4 OVERALL CONCLUSIONS

4.4.1 Summary of phase III findings

SMEs liked the toolkit. Phase III findings demonstrate the potential value of the toolkit for motivating leaders of construction SMEs and assisting them with implementation of LWE practices designed to improve health and safety performance. The toolkit functions as a resource for leaders and contains valuable information that they can use to improve their own leadership and to engage their workforce in making health and safety improvements. The overarching aim of the project (see section 1.2) has therefore been achieved. The paper-based toolkit developed in phase II has been translated into a web-based product, which was positively received by the 17 companies that participated in its development, 13 of which were SMEs. Involvement of SME leaders at the start and throughout the course of its development appears to

[34] *Two participants were removed due to an incomplete HSDT at both time points reducing the sample from 55 to 53.*
[35] *Positive skew noted for building blocks prioritisation of health and safety (T1 and T2), worker engagement (T1 and T2) and organisational learning (T1 and T2).*
[36] *Renamed from 'planning and organising' after the validity testing.*
[37] *Further details of the results are documented in an Annex report (WPS/11/37(A)), available from HSL on request.*

have paid off in terms of creating an accessible and usable toolkit. Participating SMEs were keen to continue use of the toolkit within their own companies and also thought that other SMEs would be enthusiastic about, and benefit from, its use. These findings suggest that the toolkit could be a key mechanism for cascading good practice in LWE through the construction sector. In effect, SMEs will be 'learning from the best in construction' and this model seems appropriate for the industry. The toolkit represents a distillation of the good practices of principal contractors and industry consultants. These practices have now been packaged in a way that is amenable to SMEs.

The HSDT seems valid and reliable. The HSDT provides a quick and simple means for SMEs to gauge their level of health and safety culture maturity. Importantly, it allows them to assess readiness for change and hence introduce changes that are likely to work. The findings from phase III suggest that the tool is both a valid and reliable measure of health and safety culture. SMEs can therefore be confident with using their results as a basis for action planning. It may be that SME leaders, particularly in very small companies, complete the HSDT and choose not use the remainder of the toolkit. This is not considered detrimental as some valuable learning can be gained from completing the tool, which could function as a stand-alone measure.

Barriers to uptake. Principal barriers to uptake of the toolkit and its subsequent use amongst SMEs include, firstly, a general lack of awareness of its existence, particularly amongst small companies that might not access the HSE website. Secondly, those aware of the toolkit might hold the perception that it is a time-consuming and arduous task before properly interacting with it. The key to overcoming these potential barriers seems to rest with effective marketing and promotion of the toolkit. Innovative means are needed to reach smaller companies. Rather than the traditional methods of HSE communication, industry word-of-mouth seems to offer the most potential for raising awareness of the toolkit. This could be achieved, for example, through key events involving SMEs (presentations at safety groups meetings/forums, SHADS, roads shows, etc), via relevant publications (e.g. trade journals) and the use of industry channels (e.g. CITB-ConstructionSkills, Federation of Small Businesses). Ideally, this promotion would be industry-led i.e. through LWE Forum members, associated companies and contacts. Findings from phase III indicate that the slide show developed to motivate SME leaders to commit to the toolkit once they have accessed it offers the potential to be used more broadly in terms of promotion activities. The addition of case studies into the business case showing how other SMEs have used, and benefited from using, the toolkit was also considered to be a powerful way of motivating uptake. This is consistent with a key finding in phase II feasibility testing that examples should coincide with SMEs own experiences. Case studies should also help to achieve a better balance between the consequences and the benefits of poor/good health and safety management as currently more emphasis is on the former.

Development areas. Further areas to consider for ongoing development/maintenance of the toolkit suggested by SMEs are the inclusion of health specific guidance and a tracking document to evidence aspects of the toolkit completed. A support mechanism for SMEs using the toolkit should ideally be in place following its launch.

4.4.2 Research caveats

Four caveats should be acknowledged in relation to this project: firstly, *the small sample (n=13) of participating SMEs* with a select number involved in more than one round of testing might constitute a restricted sample. Whilst those who participated in phase III held the toolkit in high esteem, the same cannot be guaranteed as true of other SMEs in the construction sector. The risk of this happening is considered to be relatively low, however, as findings suggest that saturation had been reached with the companies involved, reflected in the high degree of consistency of findings between testing sessions, and between phase III and phase II results.

Being qualitative in nature, in-depth feedback on the entire toolkit was obtained, which is a resource-intensive process. Feedback from SMEs suggested that this approach paid off.

Secondly, the possiblility that *those SMEs who participated in phase III represented the motivated companies in the sector*. It was apparent, however, that motivation to improve health and safety was not enough to stimulate participating leaders' use of the toolkit if perceived as a time-consuming process. Initial resistance by some leaders soon dimished after they started using the toolkit. In addition, one micro-company found the toolkit very helpful and planned to continue its use. It may be therefore that the toolkit itself motivated participants to improve LWE rather than vice versa. Thirdly, while *the tools contained in the toolkit, other than the HSDT, have not undergone rigorous testing*, this is not believed to impact negatively on its quality. It was considered more appropriate to test the feasibility of the entire package rather than each sub-element, given that the toolkit is designed for SMEs. These tools are underpinned by psychological theory (e.g. Bass' 1985 Transformational Leadership Theory [18] as a basis of the Leadership Check Tool) and therefore cover the relevant domains. Importantly, results show that SME leaders took away simple messages about key areas of improvement after using these tools. Finally, *a requirement for the toolkit to be as visual and as interactive* as possible is considered important for captivating SMEs. This *was accomplished as much as possible within the available budget*, although it is acknowledged that the inclusion of further visual elements might increase the appeal of the toolkit to SMEs.

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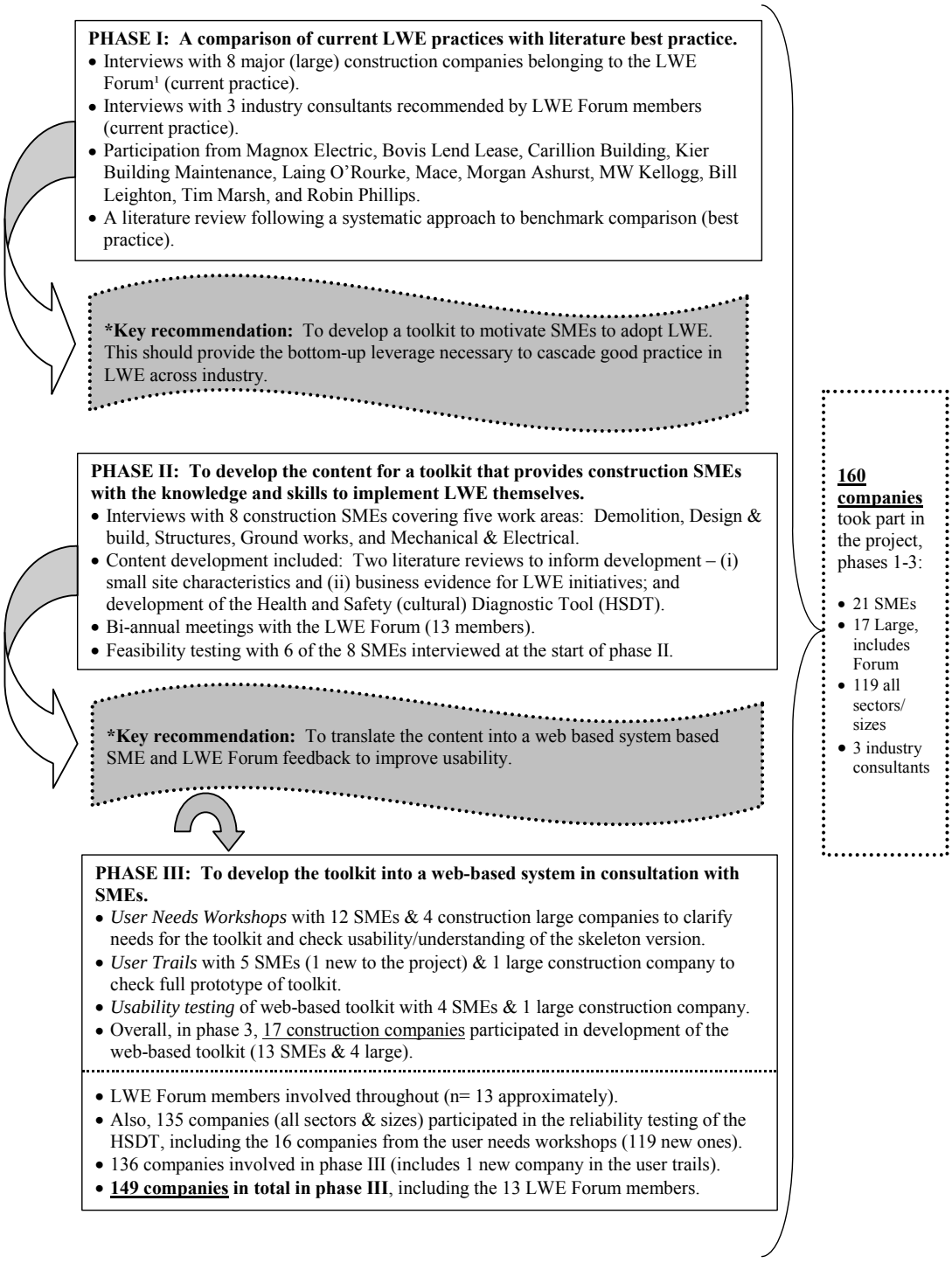
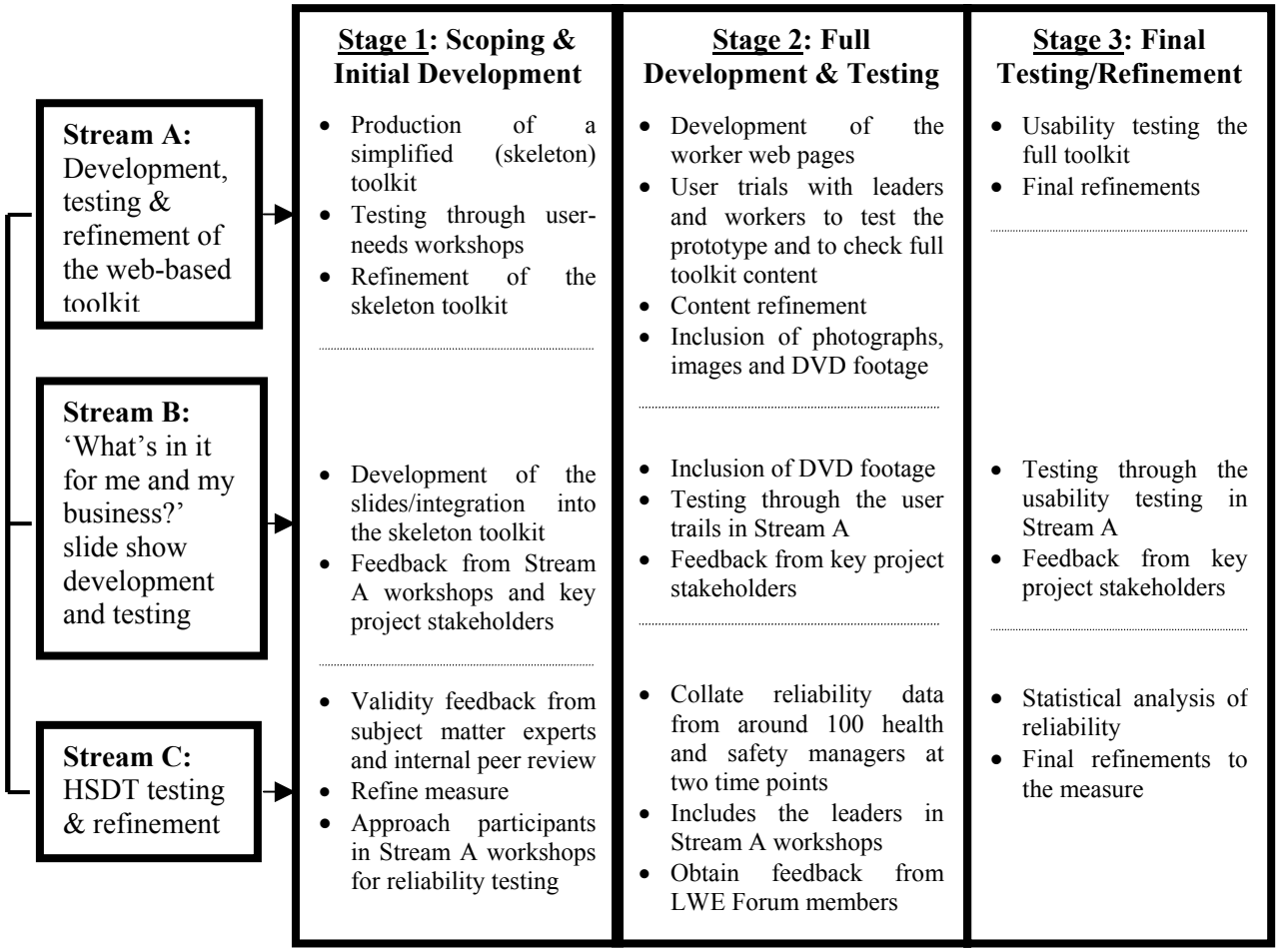
APPENDICES

APPENDIX 1 INDUSTRY CONTRIBUTION PER PROJECT PHASE

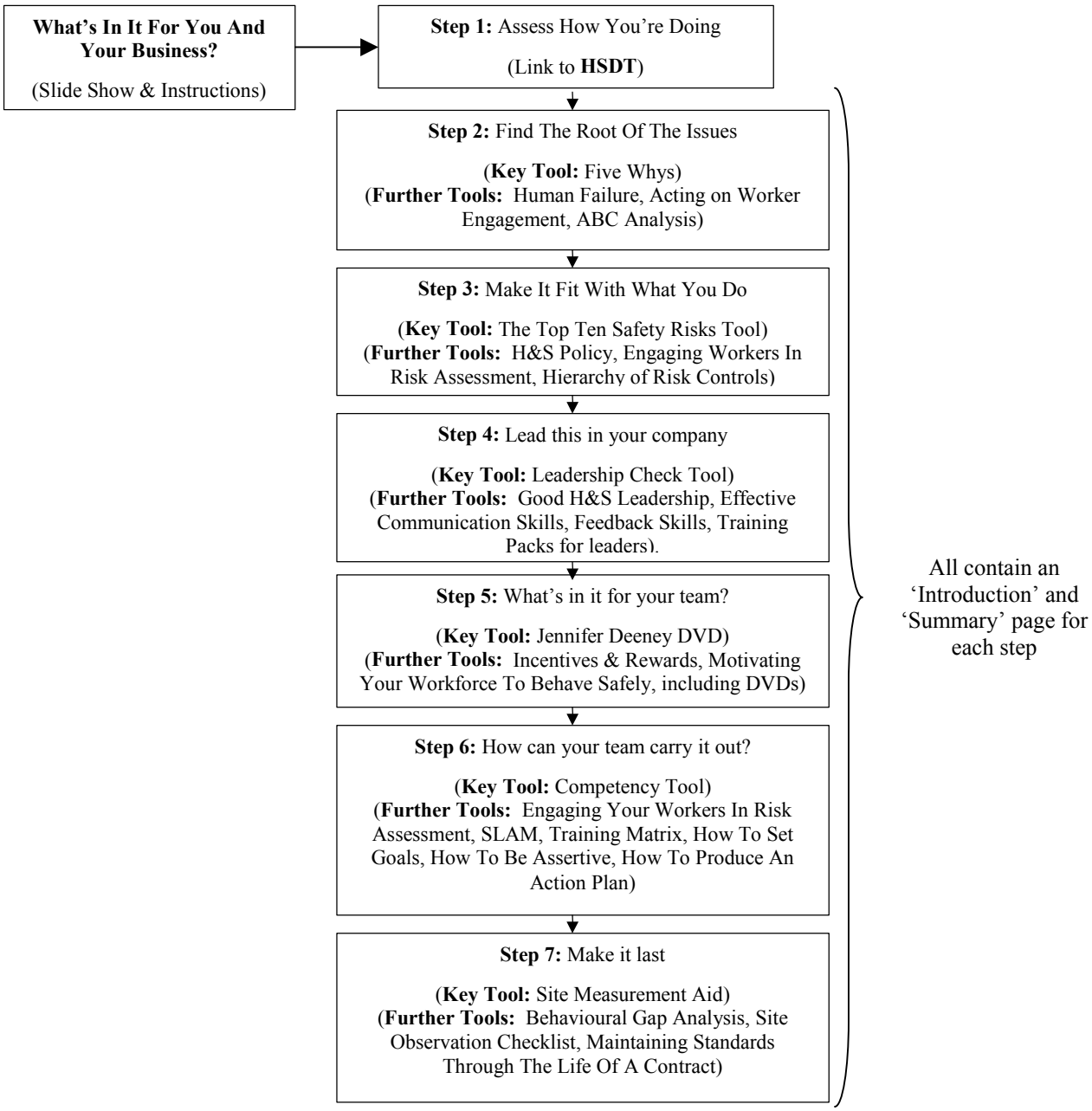


*[1] **LWE Forum:** A forum for members (mostly large construction companies in the UK) to share best practice and consider possible solutions for common safety, health and environment issues across the construction industry.*

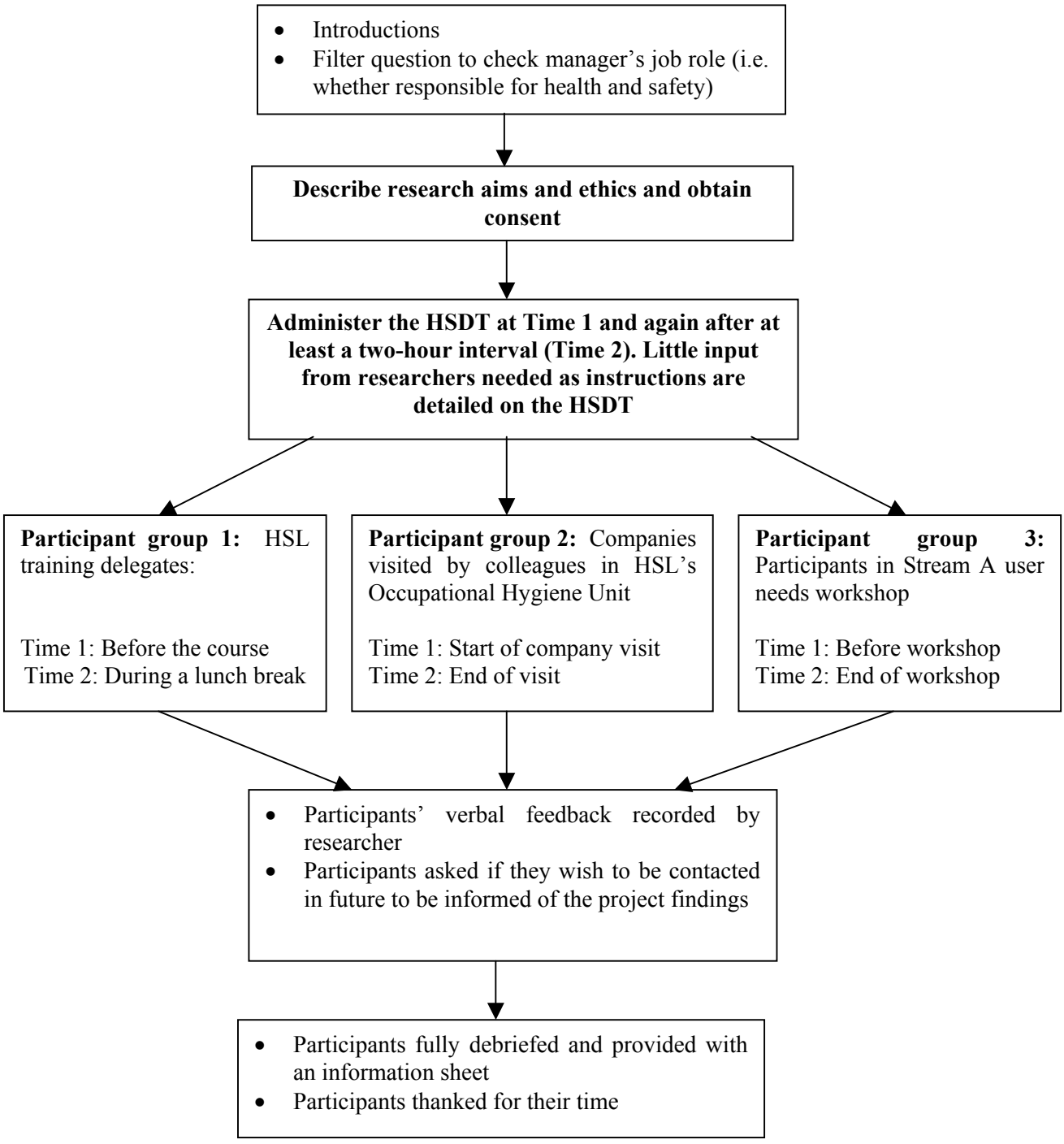
APPENDIX 2 KEY METHODOLOGICAL STAGES OF PHASE III



APPENDIX 3 SKELETON (SIMPLIFIED) MODEL OF THE TOOLKIT



APPENDIX 4 HSDT RELIABILITY TESTING ADMINISTRATION PROCESS



APPENDIX 5 THEMES THAT EMERGED IN WORK STREAM A TESTING SESSIONS

			Usability testing
1. Motivation to use the toolkit	• Enthusiastic about future use of the toolkit. Liked the structure and layout, felt the toolkit was intuitive and simple to follow • Considered use for a variety of purposes: to engage all staff, subcontractors and the supply chain; to promote a positive H&S culture; and to benchmark progress	• Enthusiastic and motivated to use the toolkit	**Same findings as the user trials** *"Good, crisp and professional."*
2. Applicability of toolkit to construction SMEs	• Considered a *"valuable asset"* as nothing like it is currently available to SMEs • Viewed as a medium to improve H&S standards, focussing on behaviour, communication and training • Ongoing involvement of SMEs during toolkit development was considered vital for it to be as user-friendly as possible • A web-based toolkit was preferred as participants used the internet daily • *"Very good…with a little more development [it] will be exactly what the industry needs."*	• Considered to be a *"valuable asset"* that fills a perceived gap, a new type of initiative from HSE (innovative compared with previous H&S guidance) • A vehicle for improving H&S standards • Participants were keen to access the toolkit electronically	**Same findings as the user trials plus:** • The toolkit conveyed a positive message about H&S in contrast to the traditional regulatory message from HSE, considered to turn away many SMEs. It was therefore a novel approach; advocating positive messages that were neither intimidating nor aggressive • *"You can do it in sections and there are prompts for further information. It takes away the - I don't know where to start."*
3. Understanding, and use of, LWE practices	• Differing levels of awareness about what LWE involves. Those with a better knowledge had adapted behavioural safety programmes from large companies • General awareness of the need to involve workers in H&S decision-making and to	• Recognised the need to improve worker engagement in construction SMEs • Little mention of the need to improve leadership practices, yet Step 4 of the toolkit aimed at improving leadership was well received by participants	• Participants identified the take home messages and purpose of each step e.g., Step 2 - the importance of finding the root cause of issues and understanding why people make mistakes, Step 3 - the need to integrate LWE programmes with existing H&S systems, etc • Having worked their way through the steps,

	create opportunities for management and workers to communicate • Focused mostly on worker engagement, very little on leadership behaviour • Examples of worker engagement (e.g. Toolbox Talks, Safety Committees) given, but did not see these as LWE		participants generally reported having a better understanding of what good practice would look like and the actions that they could take to improve H&S performance
4. SME needs and goals	• Initial focus of the toolkit should be on getting senior management buy-in • A simple, step-by-step process to follow • Instruction on how to change worker attitudes/behaviours, how to improve health as well as safety and how to implement a 'stop work' policy • Links/liaison with other companies (especially large companies) using the toolkit for advice/support • General opinion that the skeleton toolkit fits with SME needs and goals, and assists with cultural developments and legislative requirements	• Participants generally liked the design, structure and layout of the toolkit and found it simple to use • Use of Introduction, Key Tools, Further Tools and Summary pages within each step was well received (enhanced usability) • Adherence to the seven steps, as advocated • Participants understood the reason behind the Key Tools i.e. as the bare minimum that they should undertake • Noted the value of the tools/guidance for explaining *'how to'* create change	**Same findings as the user trials plus:** • The current format of the toolkit was thought to meet SME needs • Use of the Key Tools was thought to be attractive to small companies that may find some of the Further Tools overwhelming • Confidence that SMEs using the toolkit would reconsider their H&S working practices to reduce risk-taking behaviour. The DVDs and presentations displaying loss of life, serious injury and effects on profit were felt to assist with getting workers involved in the implementation of safe practices
5. Toolkit content	• Wanted visual aids and interactive tools • Needs to be highly prescriptive with no room for interpretation and include: good practice examples to promote understanding, key dos and don'ts, management duties in relation to LWE and how to achieve these. • Worker webpages need to be in simple	• Welcomed the broad mix of guidance, templates, training, interactive tools and DVDs • *Particularly liked the following:* communication information sheets, 5 Whys, training packs, interactive tools, templates for Toolbox Talks, inductions and risk assessments, guidance on human failure and acting on worker engagement, and personal	• Participants felt that a balance had been struck between providing necessary information whilst not overwhelming users. *"Information is all there to use as little or as much as you want."* • *Particularly liked the following:* communication information sheets, 5 Whys, training packs, interactive tools, templates for H&S policy, Toolbox Talks, inductions and risk assessments,

	English for foreign workers • Participants welcomed the broad range of information sheets and felt that they met their needs • "*Good*", "*Very good idea/concept*", "*Excellent*". • *Particularly liked the following:* communication information sheets, the slide show, templates for Toolbox Talks, inductions, risk assessments and accident investigation, guidance on human failure, root causes and acting on worker engagement, the HSDT and training slides • *Would like to see included:* links to other HSE and construction sites, more video clips or sound bites, training matrix templates and guidance on how to report an accident • *Suggested minor changes to:* language and presentation (e.g. reduced volume of text, more pictures, interactive tools and video clips) • Preference for downloadable Word than PDF documents to enable tailoring	testimony DVDs • *Homepage:* Considered to be eye-catching and easy to understand (understood where to go next, unprompted by researchers) • *Slide show:* Well-received, a quick and powerful way to convey important messages for motivating SME leaders to implement LWE. A good way to drive messages home. Links to DVD/audio clips were favoured • *Key principles:* Considered to be the take home messages of the toolkit, relevant to SMEs. Ideally, should be provided in a format to print off as posters • *HSDT:* Well-received, easy to follow with a good way of presenting feedback that is clear, relevant and prescriptive (tells them the *'how to'*). Descriptors of each facet of H&S culture were considered useful. • *Step 3:* Being based on the Top 10 fatalities in construction, the final trial conveyed this as a powerful tool. • *Worker webpages:* Relevant (e.g. SLAM, assertiveness skills) and easy to understand • *Suggested changes to:* pictures (to demonstrate good H&S practice), reduce the HSDT instructions, reduce the text in the worker web pages and make these more visual and interactive. Technical (navigation) issues were raised.	guidance on human failure, and personal testimony DVDs • *Homepage:* As per the user trials, "*The homepage was easy to understand and all elements within it clear and concise."* • Several participants reported that the homepage drew them into the website. • *"I think if I owned my own small building company and I had heard about the toolkit - having viewed the homepage I would want to know more."* • *Slide show:* Well-received – clear, concise and user-friendly. "*Straight to the point, not too much information per slide*." • Consistent findings with user trials, but noted that the focus was on the consequences of poor H&S management than the benefits. The inclusion of case studies may help with the benefits • *Key principles:* Same findings as the user trials. *"To be honest, I think this captures everything in one place."* • *HSDT:* Same findings as the user trials. *"The tool is very understandable and the way it works makes it very easy to complete."* • *"Provides a gap analysis and the basis of an action plan for improvement."* • *"If I had completed the questions and my results had been in the red section it would make me want*

		• Preference for downloadable Word than PDF documents to enable tailoring	*to do something about it!"* • *Step 3:* Well-received in an animated format. *"Excellent video clip in easy to understand language. The 10 risk behaviours support the video clip and give the user an insight into real safety issues and how they can be avoided."* • *Suggested improvements:* Very little further development of the toolkit was required other than suggestions to send reminder emails to redo the HSDT in 6-12 months. Also, to standardise and simplify all information sheets. Otherwise, there is a danger that only SMEs with H&S officers will use them
6. Enablers to toolkit use amongst SME leaders	• Need for the toolkit to be marketed well and clearly accessed from the HSE website. Clear messages on the benefits of using the toolkit to encourage uptake, drawing on the business, legal and moral case are required • Need to communicate the message that H&S is vital for winning work • Support mechanism is needed for SMEs using the toolkit • Accreditation (e.g. CHAS) for using the toolkit or a certificate of completion • H&S education starting at school (life skills training) • Inclusion of case studies to show the positive aspects of using the toolkit.	• A tracking document to record the steps and associated actions previously completed was suggested for SMEs that have little time for paperwork. This also provides useful evidence for HSE inspectors, insurers, etc • The provision of guidance and templates that SMEs could adapt rather than starting with a blank sheet of paper was preferred • Need for the toolkit to be promoted and clearly accessed from HSE's website. Suggested radio adverts, emails through HSE's mailing list, trade journals articles and use of CITB and the Federation of Small Businesses • The inclusion of case studies was also thought to be vital for encouraging wide uptake through realisation of the benefits that the toolkit offers	• **Same findings as the user trials plus:** • An index document at the front of the toolkit to easily locate documents (Further Tools) previously used and found helpful • A certificate of toolkit completion, which could provide useful evidence for HSE inspectors, insurers, etc • *Other means to promote the toolkit suggested:* SME forums to discuss best practice, workshops/SHADs, poster campaigns and presentations at safety group meetings/forums

7. Enablers to toolkit use amongst construction workers	• Adherence to H&S to ensure job security in current economic climate	• The personal testimony DVD was considered a powerful way to engage workers with H&S	• **Same findings as the user trials**, and it was suggested that the worker web pages would encourage a two-way H&S communication system • *"I think the pages are good in the way they inform workers to 'speak up' and also 'listen'. I believe it will encourage workers to 'do their bit' and carry out there own assessments."*
8. Benefits expected and/or gained	• A variety of potential benefits were anticipated including assisting with developing own procedures to comply with best practice and H&S guidance and ways to improve culture and worker engagement • Heightened awareness of needed improvements • Increased likelihood of securing repeat business		• Whilst participants reported using a wide variety of tools and techniques, it was considered difficult to identify clear benefits after such a short testing period. Some quick wins were reported, however, such as awareness raising and leadership improvements • One participant reported feeling more confident at implementing a behavioural safety action plan as the toolkit provided reassurance that the company was ready for this • Several participants had used the worker pages with their workers and, in one case, with supply chain workers. These participants had received positive feedback from the workers that the pages were interesting and useful • Being an HSE product participants felt that it will be apparent to users that the toolkit is well researched, credible and reflects best practice in the area, reinforcing the view that it will be effective
9. Barriers to toolkit use amongst SME leaders	• Concern over how to encourage small companies that do not access the HSE website to use the toolkit • Pre-use perception that the toolkit takes time with little financial return	• Concern over how to encourage small companies that do not access the HSE website to use the toolkit. Getting SMEs to access the toolkit and to start using it was considered the principal barrier	• **Same barrier as the user trials.** Effective marketing, case studies and word of mouth could overcome this. "*I think once other SMEs saw how useful the kit had been to others they would definitely use it."* • Initial reticence to open the toolkit for fear of it

	• Lack of consistency in H&S standards across construction sites, and transference of good/bad practices by subcontractors		taking too much time. Positive messages of other companies that have used the toolkit easily and successfully would reassure SME leaders • Participants were of the opinion that once SMEs start using the toolkit they will realise the potential benefits and buy into it
10. Barriers to toolkit use amongst construction workers	• Perceived *"hassle"* of H&S and the belief that it has *"gone too far"* • Small companies are unlikely to provide workers with IT to access the toolkit • Workers are unlikely to have the ability or inclination to use the web-based toolkit	• The practicalities of the working day for construction workers were considered to hamper use of the worker webpages. Workers are unlikely to look at these of their own volition. Use in Toolbox Talks or other training was considered more appropriate	• **Same findings as the user trials.** In addition, use of the worker web pages was thought to depend heavily on encouragement provided by leaders • *"This will be used by managers and H&S responsible. I can't imagine a bricky logging on in the evening rather than going to You Tube or Face Book."*

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Development of a web-based Leadership and Worker Engagement (LWE) Toolkit for small and medium enterprises in construction

This report summarises the final phase of a project ongoing since 2007, aiming to improve health and safety practices in construction through leadership and worker engagement (LWE). A web-based, interactive toolkit was developed with SMEs in mind. In-depth feedback (workshops, focus groups, interviews) was obtained from 17 companies (13 SMEs) at key milestones. In parallel, the validity and reliability of a Health and Safety (cultural) Diagnostic Tool (HSDT) contained within the toolkit was examined.

The toolkit was found to be useful for SMEs; it met their needs, they wanted to continue its use, had secured some quick wins and thought that other SMEs would benefit from using it. The added value dimension of the toolkit was considered to be its prescriptive ('how to') nature with simple tools and techniques. The HSDT was considered to be sufficiently reliable and valid, and helpful for making sure that changes adopted suit the company's level of (cultural) readiness.

Important considerations for ongoing implementation of the toolkit once launched on HSE's website include: how to effectively market it to SMEs, setting up a support mechanism for users, keeping the toolkit 'live', and evaluating its effectiveness in practice eg through case studies of SMEs using it.

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