



Identification and management of risk in undergraduate construction courses

(Supplementary report- April 2004)

Prepared by **Symonds Group Ltd,**
Liverpool John Moores University
and Charlton Smith Partnership for
the Health and Safety Executive 2004

RESEARCH REPORT 275



Identification and management of risk in undergraduate construction courses

(Supplementary report- April 2004)

John Carpenter CEng FICE FIMStructE MIOSH
Consultant to Symonds Group

Peter Williams MSc
Liverpool John Moores University

Nick Charlton Smith MPhil BArch FRIAS RIBA MIOA MaPS
Charlton Smith Partnership
c/o Symonds Group Ltd
Clarendon House
Stamford New Road
Altrincham
Cheshire
WA14 1BY

This report describes the final stage of research into the current provision of health and safety teaching in construction related undergraduate courses (covering architecture, building, engineering and surveying). It supplements Contract Research Report 392/2001. The study is made against a growing awareness of the importance of health and safety as part of project, and corporate social risk management, and the need for graduates to be aware of this philosophy as a key influence in the drive to reduce ill health and accidents. The aim of this final stage was to ascertain whether the recommendations made in 392/2001, and allocated to academia, had been implemented.

The study shows that the requirements of the accreditation bodies have been significantly enhanced since the Previous Report and that this is now beginning to have an effect upon the attention paid by academia to this subject area. However, despite some good progress standards remain variable. The report concludes that it is now down to academia to deliver on these requirements with continuing assistance from industry.

This report and the work it describes were funded by the Health and Safety Executive (HSE). Its contents, including any opinions and/or conclusions expressed, are those of the authors alone and do not necessarily reflect HSE policy.

© *Crown copyright 2004*

First published 2004

ISBN 0 7176 2907 4

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without the prior written permission of the copyright owner.

Applications for reproduction should be made in writing to:
Licensing Division, Her Majesty's Stationery Office,
St Clements House, 2-16 Colegate, Norwich NR3 1BQ
or by e-mail to hmsolicensing@cabinet-office.x.gsi.gov.uk

ACKNOWLEDGEMENTS

The Research Team would like to thank all those Centres which hosted a visit as part of this study, and for the time made available by staff, advisors and students.

Thanks are also due to those institutions, and other bodies which provided current data on this subject area.

CONTENTS

ACKNOWLEDGEMENTS	(iii)
EXECUTIVE SUMMARY	(vii)
1. INTRODUCTION	1
2. KEY DRIVERS	5
3. ACCREDITATION BODY REQUIREMENTS	11
4. STRUCTURE OF VISITS TO UNIVERSITIES AND SCHOOLS OF ARCHITECTURE	17
5. RESULTS AND FINDINGS	21
6. CONCLUSIONS	29
7. RECOMMENDATIONS	33
APPENDICES	
Appendix 1: Executive Summary of Previous Report (392/2001)	37
Appendix 2: Recommendations of Previous Report (392/2001)	41
Appendix 3: Examples of Good Practice	45
REFERENCE LIST	47

EXECUTIVE SUMMARY

'We challenge the professions, universities and other training organisations to deliver a workable proposal (ie to improve health and safety education and training) that meets the needs of their members, students and those affected by their work.'

Revitalising Health and Safety in Construction. HSE Discussion Document 2002 para 74.

This report is the concluding element of a three part study into the provision of health and safety teaching within undergraduate construction courses providing for tomorrow's professional architects, builders, engineers and surveyors.

Part A produced a report which concluded that although isolated examples of excellence existed, both accreditation bodies and universities/schools of architecture had much to do in terms of setting adequate standards, and integrating health and safety into the curriculum.

Part B produced a teaching and learning website containing a range of useful health and safety related data, case studies and general guidance.

Part C, (this report) provides an update on the provision of health and safety risk management within construction courses, and on the actions of others in this field.

Strategic government policy in risk issues, and, at an operational level, the poor understanding of risk management by many practitioners, emphasises both the obligation and need for further improvement. Increasingly also, competence in health and safety is seen as an integral part of corporate social responsibility, and project risk management. This necessary understanding of health and safety begins with the education base phase of a professional's career, where universities and schools of architecture must inculcate within undergraduates knowledge of legal responsibilities, a sound understanding of risk and the principles of risk management. It is only by having such a foundation of knowledge that subsequent education and training may be effective.

The executive summary of the Previous Report is enclosed in Appendix 1; the introductory points made remain valid and support the above.

This report, stemming from visits made to 31 Higher Education Centres, at which staff, students and industrial advisors were met, concludes that:

- The requirements of accreditation bodies are much improved and now generally form a credible base on which to deliver the required knowledge,
- Overall, it is considered that the key issue has now shifted from the need for accreditation bodies to 'specify the requirement' to that of ensuring that Universities and Schools of Architecture 'enable and ensure the delivery' of these requirements.
- There are some excellent exemplars of health and safety delivery, and its acceptance as a necessary part of the curriculum now has wider support than was the case reported previously, but continuing effort needs to be expended to make such examples and acceptance the norm.

- The number of Centres formally assessing their undergraduates in this topic area has risen considerably since the Previous Report.
- Some centres continue to suffer from inadequate explicit support from the head of department and a lack of cohesion amongst staff. It is concluded that, on balance, the use of a ‘champion’ to drive through and act as a focal point, is beneficial.
- The concept of health and safety *risk management* (thus placing ‘health and safety’ alongside other forms of risk) has not yet been sufficiently accepted or integrated into courses. This is seen as key to future progression and to the acceptance of ‘health and safety’ as an intellectual subject, with integrated cross-curricula application.
- Academia has forged good links with industry; these need to be nurtured and matured.
- Government, industry and institutions need to actively work with, and support academia in order that the aims of this report are achieved as a partnership, maximising each other’s skills and experience. There is scope for all parties to benefit from this exercise.

The report has set out a number of definable recommendations, applicable to government, accreditation bodies, institutions and academia in order that further improvement may be made on the back of the advances already achieved.

It is suggested that in addition to the points made above, Academia should:

- Have regard to the findings of the Previous Report, and the opportunities provided by the website;
- Audit their courses, if not already done, to ascertain not only what is provided in terms of health and safety risk management, but also to establish where opportunities lie for further integrated inclusion of material.

It is recommended that others provide essential support to academia, viz:

- The Construction Industry Council (CIC) should act as a central focus for activity by institutions, where a co-ordinated approach is beneficial.
- Institutions should monitor the success of the education base phase and ensure that ‘health and safety education’ remains an active topic for discussion.
- Accreditation bodies should ensure that their review procedures give this topic sufficient attention.

Finally, government, via the HSE, needs to support the work achieved to date via this research study, and the efforts expended by academia and others by:

- Maintaining and expanding the website
- Providing a forum for academia to exchange views and receive information on best practice

○□ Progressing other related initiatives

○□ Monitoring the implementation of the recommendations stemming from this report.

All parties should rise to the challenge set out in the quote at the beginning of this executive summary.

1. INTRODUCTION

1.1 INTRODUCTION

This report fulfils the requirements of the final stage of a three-part research project into the delivery of health and safety risk management education within undergraduate construction courses. The three parts of the project were:

Part A: A review of the provision of health and safety risk management in undergraduate construction courses (as at 2001). This culminated in the publication of HSE Contract Research Report 392/2001 entitled *Identification and Management of Risk in Undergraduate Construction Courses* (referred to throughout this text as the 'Previous Report') (HSE2001a). The Executive Summary is enclosed in Appendix 1 and the Recommendations are included in Appendix 2.

The publication of the Previous Report was notified to all to those originally contacted, ie to all accredited universities and schools of architecture. A letter was also sent by the Joint Board of Moderators to all their accredited Centres. It is not known whether other accreditation bodies took similar action.

Part B: The production of teaching aids and associated material related to health and safety risk management. The data produced under this part have been placed on a dedicated website at www.learning-hse.com. This provides:

- The broad rationale for health and safety risk management,
- Factual data
- Sources of information
- Case studies
- Examples of risk management

HSE welcomes comment on this provision (an email feedback facility is included on the site). Although written for undergraduates, the Research Team believes it will also be of interest to practitioners.¹

Part C: To undertake an audit of selected Centres to determine the take up of the recommendations of Part A, the use of the case studies, and to obtain feedback.

This report therefore is concerned with **Part C** of the project, which has been delivered through a programme of visits to Universities and Schools of Architecture (denoted Centres), and, in common with Part A, supplemented by background research.

The layout of this report mirrors that of the document produced under Part A so as to allow the two to be read together. Material is not repeated from the Previous Report unless it adds some particular value to the point being made.

Chapter 2 provides an update and review of current initiatives relevant to this subject, and **Chapter 3** considers changes to the relevant requirements of the accreditation bodies, made since the Previous Report was published. **Chapters 4 and 5** describe the visits made to

¹ *As a point of interest, the majority of queries arising from the feedback facility provided on the website relate to queries from industry, eg how do I become qualified in H&S?, where do I find out about safety policies? Those using this feedback facility are unaware of the HSE helpline. It is encouraging, however, that this website is known to those outside academia.*

Universities and Schools of Architecture, and the remaining **Chapters (6 and 7)** provide conclusions and recommendations respectively.

1.2 BACKGROUND

The Previous Report (Section 1.1) sets out the background to the research project in some detail. This argued that health and safety risk management is:

- Part of good corporate governance
- A key element of the ‘rethinking construction’ agenda and able to bring about general business improvement, as well as a reduction in ill health and accidents,
- Pervades all aspects of construction projects and requires an understanding of the behavioural and psychological factors which govern people’s contribution to project outcomes.

The Research Team believes that all of the points raised and illustrated in the Introduction remain valid; the reader is recommended to read this background statement as an important co-existent element of this final report.

Notwithstanding the above recommendation, there are two key assumptions in the Introduction to the Previous Report that merit specific emphasis as they are essential to the understanding of this Study. These are:

1. *The difference between training and education is subtle but nevertheless important, because if we want to influence the **culture** of the industry we have to realise that this is synonymous with education but not training.*

and,

2. *..... we believe we should in fact be making a step change by considering health and safety as an integral part of construction risk management. This is in line with the philosophy outlined in the opening paragraphs to this Introduction and as such enables health and safety to be presented as an intellectual challenge illustrated by practical example.*

It is now some three years since the summit conference called by the Deputy Prime Minister (and referred to in the Previous Report) recognised the need for substantial change in the construction industry. The level of accidents and ill health remains at an unacceptably high level. The need for young professionals with a good grasp of risk management in this field continues to be an essential need. Current practitioners have been shown to be lacking in this regard and although the sample questioned may have graduated prior to the inclusion of health and safety elements within undergraduate courses, it does nonetheless emphasise the crucial role of the education base in this respect.

The Health and Safety Executive (HSE) is currently emphasising the key role of designers in the procurement process. The catch phrase adopted ‘CDM- Designers Can Do More’ is borne out by research (HSE2003a) which shows that some 17-30 % of site accidents could have been prevented by better appreciation and elimination or mitigation of hazards at the design stage. The research mentioned in the paragraph above revealed (HSE2003b) that:

- Around 1/3 designers appear to have little understanding of their responsibilities,
- Few have any knowledge of health and safety legislation

The Approved Code of Practice to the Construction (Design and Management) Regulations 1994 (CDM) (HSE 2001b) states ‘Poor management is the prime cause of the unacceptable accident and occupational health record of the industry.’ (para 2).

To bring about these improvements, the education base must inculcate within undergraduates knowledge of legal responsibilities, a sound understanding of risk and the principles of risk management. It is only by having such a foundation of knowledge that subsequent education and training may be effective.

1.3 THE STUDY

In the Previous Report it was stated (Section 1.2) that *‘there is a clear gap between where we are now and where we need to be, and that everyone’s thoughts, aspirations and efforts ought to be brought to a focus in order to initiate and implement a unified and coherent approach. It is hoped that this research report will act as a catalyst for this overdue and necessary change.’*

It is concluded from this final element of the project, and from anecdotal evidence, that the Previous Report, whilst found to be useful by those relatively few Centres which have studied it, has not been the broad catalyst for change as was hoped. A number of those interviewed as part of this element of the study had not read the Previous Report in a meaningful manner despite having a copy sent to them as part of the introductory paperwork.

The Research Team hopes that this concluding report will have a wider influence than the Previous Report appears to have had, and that it will further assist in the integration of health and safety risk management into all construction related courses in an expeditious and meaningful manner.

As for Part A the study has centred on the principal professional institutions ie

- Chartered Institution of Building Services Engineers (CIBSE)
- Chartered Institute of Building (CIOB)
- Institution of Civil Engineers (ICE)
- Institution of Structural Engineers (IStructE)
- Royal Institute of British Architects (RIBA)*
- Royal Institution of Chartered Surveyors (RICS)

*linked with the Architects Registration Board (ARB).

2. KEY DRIVERS

Chapter 2 of the Previous Report acted as a summary of necessary input and actions from various organisations having a direct or indirect interest in this subject; these were broadly categorised into five groups, viz:

- High Level Government Bodies
- Industry-led Interest Groups
- Accreditation Bodies
- Professional Institutions
- Academia

This summary has now been updated as follows, using the same layout as for the Previous Report:

2.1 HIGH LEVEL GOVERNMENT BODIES

A **European Union (EU)** sponsored seminar was held in Bilbao in May 2003 entitled 'Integrating Occupational Safety and Health into Education and Training – Discussion of a Future Strategy'.² This concentrated on the need for health and safety awareness in schools. As one of the speakers stated "We need to focus on educating the workforce of tomorrow, by ensuring that schools integrate health and safety issues in the curricula from an early age with the view of making young people aware of the problem and change the attitudes of future generations." This is very much an on-going initiative, and one that, in time, will benefit higher education. It is worth noting that risk management, mostly in the form of personal safety, already features as part of the UK national curriculum at Key Stage 1-4. (DfES 1999)

The **Health and Safety Executive (HSE)** has formed a working group to further the aspirations of Action Point 34 from the Revitalising Health and Safety Strategy Statement' (DETR2000). AP34 states:

The Government and Health and Safety Commission will act to ensure that safety-critical professionals such as architects and engineers receive adequate education in risk management. This will be delivered through a programme of direct approaches to relevant higher and further education institutions and professional institutions.

Members of the construction-related institutions/institutes referred to in this report (excepting the RICS) have now been formally identified as 'safety-critical professionals'. (HSE2003c). The definition of 'safety critical' has been agreed as '*an individual whose professional practice necessitates the diligent management of health and safety risks arising from their work activity, or the product of that activity, in order to prevent or minimize the exposure of others to significant sources of harm.*

As part of the programme for this work, a telephone survey was undertaken by HSE in Autumn 2003 to ascertain the current position regarding the delivery of education in risk management. This survey was not restricted to construction disciplines, in line with the broader approach of AP34. The results of this work will be available in 2004.

HSE has recently issued a document explaining its long-term aims (HSE2004). This is a far-reaching strategy, but it includes the aim to 'develop closer strategic partnerships to improve (its) contribution to Education - by instilling an appropriate understanding of risk management from an early age.'

² http://europe.osha.eu.int/good_practice/sector/osheducation/fullproceedings.stm

HSE has also agreed to consider an educational workshop for academics (as a follow-on from the ‘Teaming Up For Education’ conference referred to in Section 2.2 of the Previous Report). The intent of this would be to disseminate good practice, allow academia to be apprised of current initiatives and understand their continuing needs in delivering health and safety risk management.

The **Quality Assurance Agency (QAA)** has now established sector benchmark statements (QAA2000, QAA2002) for:

- Architecture, Architectural technology
- Building & Surveying
- Engineering

As mentioned in the Previous Report, these set out high-level statements of general expectation about standards for the award of honours degrees; they are not specifications of a detailed curriculum in the subject. Health and safety is mentioned as follows:

Architecture

3.1.1	Design	The student will understand and appreciate the impact of design on regulatory frameworks ...
3.1.3	Environments and Technologies	... design requires an appreciation of the impact of statutory instruments for health and safety ...
5.0	Standards	
5.1	Threshold Standards	An understanding of the impact on architectural design of regulatory frameworks an appreciation of the impact on design of statutory instruments for health and safety ...
	Academic Standards: Architectural Technology	Health and Safety in the Construction Industry The graduate should have a knowledge of the principal health and safety legislation affecting the construction industry ...
	Threshold Standards	Identify and confirm regulatory requirements and constraints Identify and confirm legal requirements and constraints

Building and Surveying

Para 9	... study of building and surveying should develop an awareness of health, safety and ethical responsibilities ...
Para 13	... curricula may include as appropriate: law relating to.. use and development of land which could include .. health and safety ...
Para 16	Graduates should have acquired knowledge and understanding of: the context in which building and surveying operates including ..health and safety, ...
Para 25	The threshold standard includes the need to recognise and apply all relevant aspects of management and other specialisms within the context of regulatory requirements ...

Engineering

- P4 Intellectual ability: ..graduate engineer should be able to balance costs, safety, quality ...
- P6 Business context: ... an understanding of the constraints imposed by health and safety, ...
- P6 Engineering practice: ... a knowledge of ... the assessment of hazards and operational safety.

Criteria for Content:

Under 'Business context' Knowledge and understanding of professional and ethical responsibilities ... commercial risk evaluation.

Table 1 Under 'Engineering Practice' Knowledge and Understanding of ... codes of practice and the regulatory framework ... requirements for safe operation

The output standards of all accredited courses should comply with these statements, which will be developed by institutions or Centres into discipline-based outcomes.

2.2 INDUSTRY-LED INTEREST GROUPS

The **Engineering Council (EC^{UK})** has published a revised edition of SARTOR3 (EC1997) known as 'UK-Spec' (United Kingdom Standards for Professional Engineering Competence) (EC2003). This builds on SARTOR3 but aims to remove some of its discrepancies; amongst a number of new approaches it concentrates on output standards rather than inputs as hitherto.³ The Joint Board of Moderators intends to ask Centres how they intend to meet these standards at MEng and IEng levels, with a view to reaching agreement this year for implementation in the 2005/06 academic year.

The document also provides guidelines for institution Codes of Conduct. There is one health and safety related entry which is to 'Prevent avoidable danger to health and safety'. The Research Team believes that, for this to happen, the associated education must begin within the education base phase.

The **Construction Industry Council (CIC)** is revising the Memorandum of Understanding described in section 2.2 of the Previous Report. This contains a number of learning outcomes, which those graduating from accredited courses will have attained. The revised document (CIC2004) states:

A set of common graduate learning outcomes provides a valuable benchmark for construction and built environment graduates and CIC, as an industry umbrella body for 230,000 professionals is the appropriate forum to coordinate work in producing an agreed schedule of common graduate learning outcomes.

The learning outcomes in respect of health and safety include:

Under '**Professional Knowledge**'

'the application of health, safety and welfare legislation and responsibilities, and the processes of hazard identification and risk management.'

³ input standards have historically related to a minimum 'points' score determined from A levels, Scottish Highers or other entry exams; an alternative is to ensure adequate achievement (outputs standards) against recognised benchmarks eg QAA benchmark sector statements (see Section 2.1)

The matching criteria include;

Health, safety and welfare

- *safety in design*
 - *hazards & risks*
 - *plan & implement safe systems of work*
 - *implications for health & safety & welfare systems and procedures, responsibilities*
- analyse moral & ethical issues in design*

These learning outcomes are being assessed and developed by the CIC Common Learning Outcomes Working Group and are close to being finalised with institution members although some differences of opinion remain. Consultation with academia has taken place via the institutions.

As noted in the Previous Report each accreditation body is left to interpret these requirements. The criteria are nonetheless clear in their scope and intent, and the accreditation body requirements now match these much more closely than was the case at the time of the Previous Report.

CIC has produced a list of aims that are phrased in general terms, as a means of avoiding the barrier promoted by some, that health and safety is not part of academic study. These are to be read in conjunction with the Common Learning Outcomes and are being circulated as noted above.

CIC is also promoting a project to review designer knowledge, competency and the need for benchmarking, via 'ConstructionSkills'.⁴ This is at an early stage and it is not yet clear as to whether this will encompass the education base phase.

The concept of 'Health and Safety Champions' was promoted by CIC as a means of providing industry experience and enthusiasm to academia. This concept has not progressed; however in view of the number of different groups with an interest and the potential to deliver, CIC intend collating the various initiatives to identify common ground and encourage a unified approach. (Note that these 'champions' are different from those within Centres, and reviewed in Chapter 5).

The **Construction Industry Training Board (CITB)** continues to maintain a link with higher education. An attempt was made by them in 2002 to make selected CITB literature available, at no charge, to all higher and further education centres. This was not pursued however, due to a lack of response.

Accelerating Change in Built Environment Education (ACBEE) was established in 2002 by CITB, CIC, Rethinking Construction and two LTSNs (Learning and Teaching Support Networks) from Loughborough University and CEBE.⁵ Its aim is to focus on the need for the built environment higher education sector, and the industry, to attract, recruit and retain sufficient graduates. (ACBEE2003)

The ACBEE philosophy is based on encouraging better partnerships between the academic community, industry and professional institutions. The prime output is intended to be high quality case studies of how this has been achieved.

The Research Team believes that this initiative offers opportunity to highlight examples of where collaboration has enhanced the delivery of health and safety risk management teaching

⁴ *the construction industry Sector Skills Council*

⁵ *Centre for Education in the Built Environment*

and thus encourage others to follow suit. A reference to two such quality exemplars is given in Appendix 3.

The **Association of Planning Supervisors (APS)**⁶ has developed a training module directed at undergraduates and this comprehensive package is available free of charge to interested Centres together with the services of an APS member as a health and safety ‘champion’. At the time of writing, 31 Centres have requested a copy of this module, and 8 Centres have taken up the offer of a champion. Four of those requesting a copy have been visited as part of this study.

The Undergraduate module has been trialled with architecture students at Newcastle University and has been well received; the module contains sufficient flexibility to allow it to be tailored to suit particular needs.

The **North West Safety Initiative** organised a seminar in October 2002 (sponsored by HSE) entitled ‘Making Safety Pay’ at which the need for a step change in the treatment of health and safety risk management in undergraduate courses was emphasised.

2.3 ACCREDITATION BODIES

The view was expressed in the Previous Report that *‘In essence they (accreditation bodies) do not, on the whole, provide sufficient leadership in respect of health and safety issues. They also collectively represent a poor example of coherence and consistency in a common learning area.’*

It is fair to say that the leadership is much improved in terms of written requirement (as detailed in Chapter 3). Although it can be seen that each body has approached this in their own way, it is likely that the outcomes will be very similar, providing universities and schools of architecture embrace the need for the inclusion of health and safety issues, and the accreditation bodies ensure that compliance is achieved in a meaningful manner.

2.4 PROFESSIONAL INSTITUTIONS

In the Previous Report it was stated that *“It is generally felt that the Institutions are not ‘on board’ with health and safety, and although a number of them have health and safety committees or panels they appear to have little impact”.*

Since that time progress has been varied; some institutions act jointly as an accreditation body and institution. Changes in the former role are described in Chapter 3. Institutions deal with ‘health and safety’ as follows:

CIBSE	Has adopted the JBM ⁷ requirements; health and safety issues are dealt with by the Education & Training Committee.
CIOB	The CIOB through its health, safety and welfare caucus has taken positive action and has been instrumental in researching accredited centres to determine course details in this topic area. This is commented on in Chapter 5.
ICE	Member of the JBM. The health and safety board has recently (December 2003) commenced a dialogue with the JBM to determine how the delivery of health and safety may be improved.

⁶ Association of Planning Supervisors 16 Rutland Square Edinburgh EH1 2BB

⁷ Joint Board of Moderators

IStructE	Member of the JBM. Within the institution this topic is the responsibility of the Membership Committee although in the recent past action has, in practice, been delegated to the JBM.
RIBA	Responsibility of the Practice Committee. RIBA has significantly revised its accreditation requirements
RICS	Responsibility of the recently established (2004) Health and Safety Forum. RICS has revised the accreditation requirements.

It is clearly important that where health and safety is the remit of a committee with a broader interest the membership is chosen to ensure that health and safety risk management receives due attention. The status of the committee within the institution management structure is also important, as it must have authority to ensure its recommendations are given due weight and consideration.

The **Inter-Institutional Group for Health and Safety (IIG)** published guidance in 1999, as noted in the Previous Report. A working group was recently established to further this work and has produced a scope document (Outline of Proposed Undergraduate Engineers Teaching Material on Managing Risks) to be worked up by others into a published toolkit of teaching material. This was sent in December 2003 to the member organisations of IIG, the Engineering Council, the Environment Agency and the Engineering Professors' Council. The responses received at the time of writing this report have been encouraging and it is hoped that funding will be available to take this initiative to the next stage.

The **Hazards Forum** held an evening meeting in July 2002 entitled 'The Effectiveness of Undergraduate Risk Education' (HF2002) with a panel of eminent speakers. The Research Team would recommend the resulting document to all those interested in this area of education; the discussion it records is wide ranging, emanates from the broader engineering industry, and is thought provoking.

2.5 ACADEMIA

The Previous Report stated that: *"There appears to be a number of committed individuals within academia who are involved in moving the health and safety agenda forward, or who have developed significant health and safety elements to those courses for which they are responsible. These are few in number however, and they tend to act in isolation"*.

The authors believe that this largely remains the case and would reiterate the need for Centres to consider the desirability of having a 'champion' in each department, supported by senior management, to co-ordinate the implementation of this subject area across the curriculum.

Behind the immediate issues associated with the delivery of health and safety risk management, lie some more general concerns and problems associated with academic staff experience, recruitment constraints, and Centre links with industry. (JBM2003a,b, HEFCE2002, IoD2002, SCOSS2003). SCOSS⁸ has urged the ICE and IStructE to review these issues, and others that impinge on the future delivery of engineering courses.

A group of universities⁹ has created '**Student-centred learning in construction education' (SLICE)** funded by HEFCE.¹⁰ The concept is to develop small-scale student-centred learning

⁸ SCOSS – Standing Committee on Structural Safety. www.scoss.org.uk

⁹ Plymouth (lead), Salford, Greenwich, Birmingham and Brighton

¹⁰ Higher Education Funding Council for England

activities for undergraduates on building courses. Currently there are 8 learning packs including one entitled 'construction health and safety'. It comprises a lecturer's toolkit and three study packages.

2.6 TURNING CONCERN INTO ACTION

In the Previous Report, actions arising from this seminal conference were noted. These were:

- (i) the CIC confirmed their intention to review and make more specific their 'Common Learning Outcomes'; and
- (ii) to work towards every undergraduate course having at least one health and safety awareness day in each year.
- (iii) the **Construction Industry Training Board (CITB)** in their 'Key Actions for 2001' (CITB2001b) include - *Work with the HE sector and representatives from the industry to introduce a more comprehensive and relevant health and safety content in higher level courses.*

The CIC has revised the learning outcomes as noted in Section 2.2. Although no overall progress has been made in respect of the health and safety awareness days a number of Centres have of their own accord developed specific arrangements (discussed in Chapter 5). However, this concept does not universally find favour with course providers many of whom would prefer a fully integrated approach to incorporating health and safety risk management into their courses.

Unfortunately, the CITB has not had sufficient response to their enquiries to develop a strategy directly with universities and hence it is now in contact with the Department for Education and Science (DfES) on this issue. It is however piloting (with the Construction Confederation) a health and safety test with three universities (Loughborough, University College London and Liverpool John Moores) using a mobile test centre and the safety test used as part of the Construction Skills Certification Scheme (CSCS). This is intended to provide year-out undergraduates with a CSCS trainees' card to allow them to obtain work on sites during their work placement or vacation periods.

3. ACCREDITATION BODY REQUIREMENTS

The Previous Report outlined the requirements of the then four primary accreditation bodies in respect of health and safety matters. It was noted that these requirements varied significantly in both approach and detail.

Since that time all the accreditation bodies have revised their requirements; these are described in the following paragraphs. In summary however key attributes are:

Table 1 Accreditation Body requirements

<i>Accreditation body</i>	<i>General statement</i>	<i>Explanation</i>	<i>Detailed requirements</i>	<i>Learning outcome detailed</i>
CIBSE	Y	Y	Y	Y
CIOB	Y	N	Y	Y
JBM*	Y	Y	Y	Y
RIBA/ARB	Y	N	N	Y
RICS	Y	N	N	N

*representing the ICE and IStructE

A major change since the Previous Report, is that CIBSE is no longer a member of the JBM; it now operates as an independent accreditation body.

3.1 CHARTERED INSTITUTION OF BUILDING SERVICES ENGINEERS (CIBSE)

Although CIBSE is no longer a member of the JBM the Institution has confirmed that it continues to follow the same requirements in respect of health and safety. In fact it currently utilises a previous edition of the guidelines produced by the JBM. Although the difference is not significant in the content, it does result in the omission of the guidance relating to how the various threads might be incorporated. (Described below under Section 3.3)

3.2 CHARTERED INSTITUTE OF BUILDING (CIOB)

The CIOB has published a ‘Health and Safety Action Plan’ (CIOB2002), which sets out the Institute’s intent in this area and which was approved in October 2002. The preface states that it is available to all accredited universities and colleges and goes on to say (Appendix 1) that:

“The CIOB recognises that health and safety issues should be given greater prominence generally and within the Education Framework in particular. The institute believes also that education is the primary key to changing the culture of the construction industry.”

In this Plan, education is one of three focus areas. The Comment and Guidance Notes provided for this area are very specific in terms of the provision of learning outcomes, the commitment to these by heads of schools, and demonstration of delivery.

The action plan sits alongside the ‘Education Framework 2003’ document, which updates the previous 1994 version. It came into force in January 2003.

The structure has altered from its predecessor in some important ways; for instance the three levels of attainment are now:

Level 1	Principles and context
Level 2	Analysis and application
Level 3	Synthesis and evaluation.

Reference is made to health and safety issues at all three levels within the tables of learning outcomes; the core learning outcomes are not prescriptive but these together with the QAA benchmark standards (see section 2.1) provide guidance on the levels of achievement expected. The detail in this document, however, is less explicit than the previous framework, and it is only when read in conjunction with the Action Plan commitment that the full extent of expected coverage is determined.

The CIOB ‘health and safety caucus’ implemented a survey of accredited Centres during 2003 to establish what was actually being delivered.

3.3 JOINT BOARD OF MODERATORS (JBM)

Since the Previous Report the formation of this accreditation body has been changed. It now represents the ICE and IStructE, as previously, together with the IHIE¹¹ and IHT.¹²

In addition to the change to the composition of the JBM, the requirements for health and safety have also been amended, as part of a larger comprehensive review of first degree requirements, and details are now available on the JBM website (www.jbm.org.uk- Annex C). This open availability is welcomed as a positive move, allowing ready access by students, staff and others with an interest.

Whilst the basic course guidelines in respect of health and safety remain unchanged, an important addition is the grouping of these under the heads of *Attitude, Competence and Knowledge* (referred to in Section 2.2 of the Previous Report), together with suggestions as to how the requirements may be incorporated into courses.

Notwithstanding this advice, the JBM remains keen that Centres should be left to decide the detailed application themselves, reflecting a reluctance to be prescriptive in respect of such a wide range of accredited courses. It reflects also a policy that accords with current Engineering Council (EC^{UK}) thinking which concentrates more on output standards than on input standards and course detail. The course guidelines will be amended to accommodate the revised output standards as noted in section 2.2.

The JBM annual report for 2002 recognises ‘the need to improve the teaching of health and safety’ (JBM2003b).

3.4 ROYAL INSTITUTE OF BRITISH ARCHITECTS/ ARCHITECTS REGISTRATION BOARD

The RIBA has comprehensively revised its course requirements since the Previous Report and these are contained in a document entitled ‘Tomorrow’s Architect’ (RIBA2003). This document gives an outline syllabus, and details of programmes and examinations. The requirements apply to courses from September 2003.

¹¹ *Institution of Highways Incorporated Engineers*

¹² *Institution of Highways & Transportation*

The text recognises the issues associated with overcrowding of the syllabus whilst ‘responding positively to the inclusion of health and safety’. It also states that ‘There is a danger that, without explicit and assessed application in the work of the design studio, the themes of the syllabus will not be fully incorporated into the student’s design thinking. These are considered by the Research Team to be very positive statements.

Part 1 (years 1 to 3) and Part 2 (years 4 and 5) of the syllabus (the undergraduate elements) have five thematic headings, ie Design, Technology and Environment, Cultural Context, Communication and Management, Practice and Law. The outline syllabus defines the learning outcomes of these core subject themes, which are then supported by supplementary studies. Health and safety features as part of the core requirements in all theme areas apart from Cultural Context and Communication. The expected standard of attainment is expressed in the now familiar format of awareness, knowledge, understanding or ability (mentioned also in Section 3.2 of the Previous Report).

The core requirements are (extracting the relevant elements):

Part 1 Design	Students will demonstrate coherent architectural designs that integrate a <i>knowledge</i> of: <ul style="list-style-type: none">• The regulatory frameworks, and health and safety considerations that guide design and building construction.
Technology and Environment	Students will demonstrate, within coherent architectural designs and the academic portfolio, the <i>ability</i> to integrate knowledge of: <ul style="list-style-type: none">• Human well being;• The impact on design of legislation, codes of practice and health and safety both during construction and occupation of a project.
Management, Practice and Law	Students will demonstrate within an academic portfolio, <i>knowledge</i> of: <ul style="list-style-type: none">• How buildings are designed and built in the context of architectural and professional practice and the framework of the construction industry within which it operates <p>(see note at end of this extract).</p>
Professional Experience	The document indicates that students should develop a ‘rounded understanding of the architectural practice and roles and responsibilities of an architect’ leading to: <ul style="list-style-type: none">• An understanding of the professional duty of care, and other legal and ethical responsibilities arising from the relationship between client and architect, employer and employee.’ <p>(see note at end of this extract)</p>

Part 2 Design Part 2 relates to professional practice skills. The requirements are along similar lines to Part 1, but reflect the greater experience of students:

Students will produce and demonstrate coherent and well-resolved architectural designs that integrate (an *understanding*) of:

- The regulatory requirements including the needs of the disabled and health and safety legislation and building regulations and development control, that guide building construction.

Part 2 Technology and Environment Students will demonstrate, within coherent architectural designs and the academic portfolio, the ability to integrate (an *understanding*) of:

- Building technologies, environmental design and construction methods in relation to-

-the impact of design on legislation, codes of practice and health and safety both during construction and occupation of a project

Management, Practice and Law Students will demonstrate, within an academic portfolio an (*understanding*) of:

- The fundamental legal, professional and statutory requirements as they relate to building design and practice, with particular reference to matters relating to health and safety

Part 3 Although Part 3 is outwith this study, the document continues to make reference to health and safety requirements in this last element of education and professional practice.

Note.

There is a need for the explicit reference to ‘health and safety’ issues, as noted under two of the above headings, so as to ensure consistency of interpretation.

3.5 ROYAL INSTITUTION OF CHARTERED SURVEYORS (RICS)

The RICS has developed partnerships with universities to provide accredited courses. The RICS does not prescribe specific elements of the curriculum, and therefore has no stated requirement for health and safety within the education base. Although RICS state that new courses are mapped against the competencies required of chartered surveyors as given in their publication ‘APC/ATC requirements and competencies’ (RICS2002) it is understood that this does not infer that health and safety issues will necessarily be included beyond compliance with the QAA benchmarks (see section 2.1). The Research Team was informed that in this subject area Partnership Centres usually follow the requirements of the accreditation body, rather than setting a higher standard of their own accord.

The RICS has published a useful publication on the management of risk (RICS2003) in which it states ‘*Education and training in risk management is crucial*’. It goes on to state that:

There is a gap between theory and practice that needs to be bridged by an education programme and user-friendly guidance at all levels. Industry is practising varying degrees of risk management but the education system doesn't always appear to be teaching to meet the needs of the industry. but the real need is to educate students at the outset of their careers about uncertainty, hazards, probability and risk.

This positive statement appears to be at odds with the lack of emphasis by RICS within their course accreditation documentation.

3.6 SUMMARY

It can be seen that the requirements of the various accreditation bodies have been much improved, compared to those described in the Previous Report. Generally, they now form a credible base for the delivery of health and safety risk management teaching within undergraduate construction courses. The Research Team believes that, overall, the key issue has now shifted from the need for accreditation bodies to 'specify the requirement' to ensuring that Centres 'enable and ensure the delivery' of these requirements.

It should be noted however that courses accredited before the dates of implementation of the various updated requirements, will not necessarily satisfy the revised rules or guidance (this varies between accreditation bodies). Although the frequency of the accreditation visits to Centres is usually quinquennial (and hence it is possible for existing courses to run for another 4 years or so before changing), it is to be hoped that all Centres will appreciate the advantages and necessity of delivering health and safety risk management in line with current thinking.

4. STRUCTURE OF VISITS TO UNIVERSITIES AND SCHOOLS OF ARCHITECTURE

4.1 GENERAL

In order to establish to what extent the recommendations of the Previous Report had been taken on board by Universities/Schools of Architecture (referred to as Centres), and their awareness of the teaching aid website, the Research Team arranged to visit 31 Centres in a similar format to that adopted for Part A. These visits represent the last element in this Study.

The number of visits was agreed during the project negotiation stage, and matched that undertaken in Part A.

In keeping with the belief and practice established during Part A that visits should be of value to the Centre, as well as to the Study, those visited were offered a short CPD session in the form of a presentation on risk management issues. It was made clear that this was open to both staff and students. Eight Centres accepted the offer of this presentation, which, as for Part A, was often the catalyst for a lively debate on the issues raised. (Discussed in Chapter 5)

For the visits made under Part A, the Research Team established which member of staff in each selected Centre had notional 'hands-on' responsibility for health and safety issues. The visit was then arranged through that identified person. On this occasion it was decided to approach directly the head of school (a title intended in this text to be generic, and to cover other variants, such as head of department). It was the 'head of school' who was noted in the Previous Report to be a barrier to progress in a significant number of Centres (Chapter 6, Conclusion 9).

The letter, addressed personally to the head of school, reminded the recipient of the Study to date, and of its outputs. A copy of the Previous Report was enclosed. The letter asked if the Research Team could visit the Centre, making it clear that it wished to meet with the recipient, and any other staff they might think appropriate. This was done for two reasons:

- Because the responsibility for course content and implementation ultimately rests with the head of school; and
- To see what action was taken in respect of ownership.

This proved to be an interesting (and frustrating)¹³ exercise; the responses are scheduled in Table 2 overleaf.

¹³ *The handling of the letter by recipient Centres was, collectively, an example of poor management. The majority of letters were passed to other staff. This process often generated confusion, resulted in a lack of response, and awareness of the original request, and at a number of Centres, a loss of the documents – one set having to be sent out three times. No attempt appears to have been made by the original recipient to check that action had been taken. Subsequent calls and emails often went unanswered and the ubiquitous voicemail proved a real barrier. However, as noted in the text, once contact had eventually been made there was a willingness to host a visit and, in most cases, an interest in what was being researched. It was also clear that re-organisation of many departments had imposed a heavy burden on staff, which had perhaps influenced the speed of response.*

Table 2 Responses to letters

<i>Targeted accreditation Body</i>	<i>Letters issued</i>	<i>Response by original recipient</i>	<i>Willing to have a visit</i>	<i>Involvement with original contact during visit</i>
<i>CIBSE</i>	0	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
<i>CIOB</i>	3	2	3	2
<i>JBM</i>	12	1	12	3
<i>RIBA/ARB</i>	8	2	8	5
<i>RICS</i>	8	0	8	6
<i>Totals</i>	31	5	31	16

It was notable that only 5 responses were received from the initial recipient, chosen as the person with the responsibility for and opportunity to ensure that health and safety risk management education was integrated into their department's courses. In all other cases the letter was passed to others, which tended to have the effect of diluting the ownership. Despite this, once contact was made, many of the Centres were clearly enthusiastic in respect of the visit, and were keen to relay to the Research Team the action that was being taken or to hear the Team's views.

Although the visits were established on the above basis (ie with a notional target accreditation body in mind), it was found during the visits that at a number of Centres more than one accreditation body was involved. (This tendency appears to have increased since the visits made under Part A with the formation of 'Built Environment', and similar departments). Thus, when measured in terms of accreditation bodies rather than Centres, the visit distribution was:

Table 3 Visits measured by accreditation bodies

<i>Accreditation body</i>	<i>Number represented</i>
<i>CIBSE</i>	0
<i>CIOB</i>	9
<i>JBM</i>	15
<i>RIBA/ARB</i>	8
<i>RICS</i>	10
<i>Overall</i>	42

This distribution has been used when analysing some of the results, as noted in Chapter 5.

4.2 SELECTION OF CENTRES FOR VISITS

It was recognised, as for Part A, that there was a number of ways in which the Centres to be visited could be selected; no attempt was made to do this statistically or by using strict sampling techniques in view of the inherent variables.

It was decided that, on balance, benefit would be obtained by re-visiting a proportion of those centres included in Part A, supplemented by others not included during the Part A visits. This latter group represented 30% of the total. There was also some minor adjustment between disciplines. The geographical distribution of those Centres visited is shown in Figure 1 at the end of this Chapter.

4.3 FORMAT OF VISIT

In line with Part A, and the stated aim of trying to bring some value to the Centre itself, rather than the visit being seen as 'yet another survey', the Research Team continued with the programme structure previously adopted, consisting of:

- An interview with the main contact, and other staff proposed by the Centre,
- A presentation (on health and safety risk management).

In the event, only 26% of Centres visited wished, or were able, to accommodate the last item.

4.4 INTERVIEW FORMAT

A standard interview format was utilised, as for Part A, the contents of which were determined by the Study brief, ie to ascertain the take up of the recommendations from Part A, the use of the case studies, and feedback from the universities themselves. The Research Team briefing paper, listing the questions to be asked, was forwarded to all Centres in advance of the visit to allow them to prepare, and ascertain any data that might be relevant.

As noted in Section 4.1 it had been hoped to meet with the head of department; in some cases this occurred (or a brief introduction was made), but in approximately half of the Centres visited the interview took place with a nominated member(s) of staff. These nominees did not always have an understanding of the entire picture in respect of the extent or detail of delivery in this topic area.

Individual comment was encouraged and welcomed and some wide-ranging discussions arose. These were considered as valuable as the formal interview itself and are therefore reflected in the 'Findings'.

As for Part A, the Research Team member making the visit was, in most cases, from a professional background consistent with the Centre visited.

In order to encourage frank and detailed answers, the Centres were assured that their responses would remain confidential to the Research Team. This was thought to be necessary as it was anticipated that a number of Centres might not be complying strictly with their accreditation body requirements. Notwithstanding, Centres were almost invariably open and frank in discussing their approach to the teaching of health and safety on their courses and also with regard to their views on the subject generally.

4.5 VISIT SCHEDULE

The visits were made over the period November 2003 to March 2004.



Figure 1 Location of Centre visits

5. RESULTS AND FINDINGS

5.1 INTRODUCTION

5.1.1 Presentation of results

The % results are generally presented in terms of 'Centres visited' (31). However Figures 2-5 are computed in terms of 'accreditation bodies represented' (42). (See section 4.1).

5.1.2 Findings by others

As mentioned in Section 3.2, CIOB has recently conducted a survey of its accredited Centres by postal questionnaire, to establish the actual provision of health and safety teaching in associated undergraduate courses. The results are being considered within CIOB but are not yet available for external consideration.

HSE has also made enquiries as to the teaching of risk management in undergraduate courses, as noted in Section 2.1. These results are not available at the time of writing, but will add useful data in due course.

5.2 INTERVIEW RESULTS

As noted in Section 4.4 the Centres were provided with a copy of the questions that were going to be asked as a means of assisting their preparations for the visit and to give some guidance to them as to the areas of interest to the Research Team.

Although most questions were generally designed to be closed, it was found in a number of cases, that the given answers reporting an achievement were qualified in some way. Thus the answer to the question 'have you read the Previous Report' might be 'yes', but then it might also transpire that this read was 'a quick review', or 'only just before the meeting' (this specific situation was identified and is reported below). Thus the positive answers and associated % achievements given in the following paragraphs should be considered upper bound (optimistic) estimates and subject to some limitations.

5.2.1 Previous Report

The interviews established that:

- 74% of those Centres visited had read the Previous Report although disappointingly 65 % of this affirmative group had only done so as part of the preparation for the meeting with the Research Team.
- 29% of these Centres' senior management had taken note of its recommendations and findings and had also used the Previous Report in some way in order to assist in the course development (Fig 2). This had been achieved in a number of ways viz:
 - development of a risk management module,
 - project on disasters/deficiencies in design
 - introduction of health and safety onto module descriptor sheets
 - raising awareness in general course development.
- As far as wider knowledge was concerned the answers indicated that in 26% of Centres other staff were also aware of the report (Fig 2).

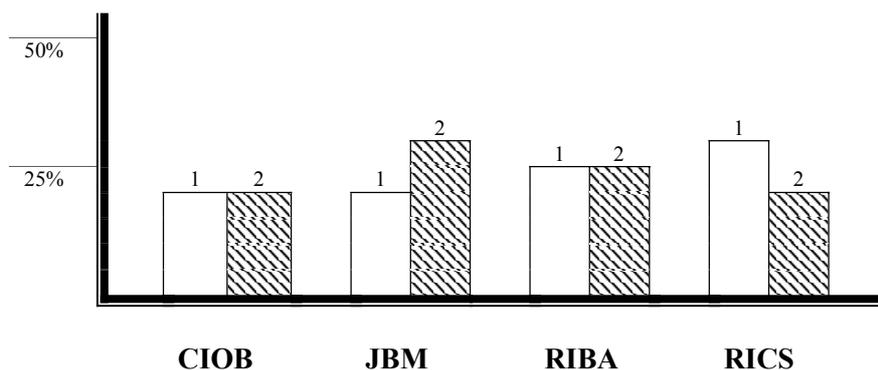


Figure 2 Staff awareness and use of previous report

Column 1 staff aware of Previous Report

Column 2 Previous Report had assisted with course development

It was clear that most of those who had read the Previous Report found it to be a useful source of information which had informed their thinking about the relevant parts of the curriculum. Those who had only recently read it were generally pleased to have been alerted to it as a consequence of the visit by the Research Team. It was noted that the report had demonstrated the importance of health and safety, and its place in the curriculum, to other staff. The comment was made by some Centres that the Research Team visits were of as much value as the Report itself in terms of the general advice and commentary that flowed from the visit.

However, the comment was also made to the Research Team that ‘research reports’ of this nature were not usually read due to the volume of material received by academics (ie information overload). It was suggested that a short synopsis, produced specifically for staff, would have been useful.¹⁴ Where other staff had been made aware of the Previous Report, they were usually of small number; few Centres had considered the report in a comprehensive manner and two Centres (RICS and JBM related) made the point that ‘it wasn’t on the agenda’ when compared with other issues.

As noted in Chapter 3, the changing requirements of accreditation bodies have in some cases brought enhanced validation demands. Where this is the case then ‘health and safety’ has received more attention than hitherto. This applied particularly to RIBA accredited and ARB validated courses.

5.2.2 Implementation of the recommendations from the previous report

The Research Team reviewed with the Centre those recommendations from the Previous Report that related to Academia (Section 7.6).

Recommendation 7.6 (1)

Academia should recognise that H&S risk is part of construction risk management and an essential intellectual element of all construction related courses.

All Centres indicated that health and safety was considered an essential part of construction risk management, and featured within the course. The benefits were mentioned of working to a common curriculum across disciplines (inter-disciplinary working) as a means of avoiding the ‘silo’ approach.

¹⁴ *The Executive Summary was in fact designed to fulfil this purpose, but it might be useful to consider a series of separate 1-page briefing notes arising from this report and directed at specific target groups.*

It was clear from subsequent questions however that the implementation of this ideal varied considerably between Centres. The Research Team considers that many Centres have not yet embraced the concept of health and safety *risk management* (a phrase emphasised in the introduction to the Previous Report). This phrase should foster interest in ‘risk management’ as a collective term for a range of risk related issues currently dealt with disparately within courses. This is a key concept and one that gives the subject its intellectual basis, its linkage with other forms of risk eg financial and technical, and hence also its cross-curricula status and opportunities.

Recommendation 7.6 (2)

Academic courses of study should be formally audited with a view to including H&S risk management in all built environment programmes as an integral and cross curricula element
 62% of Centres had audited, or were in the process of formally auditing courses, as an internal exercise, to establish what and how health and safety risk management was already taught, and where opportunities existed for further or better inclusion (Fig 3). It was clear that where this had been done in a comprehensive manner, benefit had accrued. One Centre made the point that ‘internal communication’ was essential.

In some instances the audit process was currently underway in relation to architectural course development in response to ARB validation requirements.

It was also the case however that in some instances that the reported ‘audit’ was not as comprehensive as it could have been and the Centre had lost therefore an opportunity for a thorough review. Although a number of Centres had reviewed individual modules for health and safety content, the benefits of an audit across all taught subjects had not generally been appreciated ie the identification of areas where reference to health and safety risk management could beneficially be made. This exercise was in some cases hindered by a degree of protectionism and insular thinking from some staff, with specialists often lacking interest in such an exercise. This emphasises the importance of Centres having clear support from their head of department and a strong ‘champion’ in this area of the curriculum.

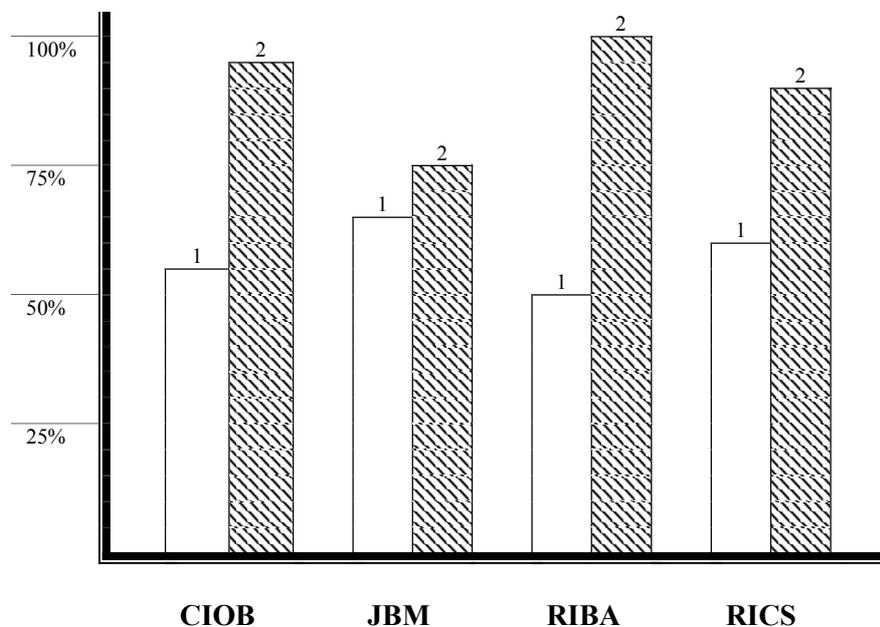


Figure 3 Centres having audited their courses and which assessed undergraduates

Col 1 centres having audited courses
Col 2 centres assessing undergraduates

Recommendation 7.6 (3)

H&S elements of courses should be subject to specific assessment and this should be quality assured.

87% of Centres reported that they formally assessed health and safety elements of courses either through mandatory exam questions, coursework or through project work (Fig 3). It did not appear to be the case however that all health and safety elements within a course were necessarily assessed or that the assessment strategy had been related to the course audit. One Centre had consciously decided not to assess. Most RIBA/ARB Centres were in the process of establishing assessment processes as part of the required ARB validation regime.

Those Centres that assessed undergraduates in this field did not appear to find it an onerous task.

The percentage of Centres assessing this element of the course is significantly higher than was reported in the Previous Report (Section 5.3.6) where the equivalent figure was 43%; the Research Team finds this encouraging.

The question was raised by academic staff at a number of schools of architecture (although the point is generally applicable) as to whether health and safety assessment should be made against a progression requirement, applicable to all undergraduates, and reflecting the importance and statutory underpinning of this topic area.

Recommendation 7.6 (4)

H&S Champions should be appointed, with appropriate status, as a means of achieving genuine co-ordination across the curriculum

42 % of Centres had a recognised health and safety champion. This compares to 65% reported in the Previous Report (Section 5.3.2). This is a significant reduction- perhaps a function of the re-organisation of departments and the pressures on staff as noted below. A number of those centres visited during Part A, and recorded as having a champion, now report that they do not have one.

It was clear to the Research Team that those Centres that had a small team of staff to provide the role of champion, gained the most, through a sharing of the workload, dissemination of ideas and group enthusiasm. Having such a 'critical mass' of enthusiasm and knowledge clearly made a difference, as did 'persuasion' rather than 'compulsion' in respect of contact with other staff.

Notwithstanding the above, the concern was again raised by some that the presence of a champion resulted in other staff relying on that person (or group) to provide the entire course content (a concern raised in the Previous Report, Section 5.3.2, and which clearly is still relevant). This is understandable but is a management issue. There was also an expressed concern in some departments that staff members are unwilling to take on additional duties, which might militate against their contribution towards the research assessment exercise (RAE).

The Research Team was pleased to note that the visit itself acted as an impetus for some Centres to form a group, and discuss the subject, by way of preparation for the discussion with the Research Team.

Recommendation 7.6 (5)

The concept of H&S awareness days should be considered as a supplementary means of introducing risk management in an intellectual and stimulating way.

The Research Team emphasised that awareness days were intended to supplement, not replace curriculum content, and were mentioned only for 'consideration'.

26 % of Centres incorporated a health and safety awareness day within the course. These Centres were enthusiastic about its benefits. The form of awareness day varied significantly: two Centres offered week-long courses with hands-on experience, in the first term.

Those which did not provide a day, or its equivalent, generally considered the logistics of doing so (year on year) to be problematic and perhaps out of proportion to the benefits.

The view was also expressed, however, that such a 'practical' day potentially undermined the very academic standing of health and safety risk management that was being sought. (The Research Team do not believe that this need be the case if the day's objectives are well planned and explained).

One Centre (noted in Appendix 3) has developed a particularly successful formula involving a contractor. It is understood that this concept has been taken up by another Centre and that CITB are making facilities available to encourage further general adoption.

Recommendation 7.6 (6)

Professional development opportunities should be provided for relevant staff having particular regard to their professional institution obligations and specific funding should be sought, if necessary, to assist in this respect

The Research Team believes that this remains a problematic area with only 52% of Centres reporting positively in this respect although, as can be seen from Figure 4, the results do vary significantly between Centres when compared by accreditation body. (The discussion that took place around this subject suggested however that these results should be considered an optimistic estimate). Although most Centres indicated that they had staff CPD budgets, it was usually left to individuals to make an application for this. Whilst placing the onus on individuals is appropriate, the view was often expressed that individuals did not take this up due to pressure of work, lack of interest, and the need to concentrate on their research area.

A number of Centres however had well developed procedures and routines for provision of 'industrial' CPD. These included lunch-time videos and sessions provided by the local RIBA region. It appeared to the Research Team that 'where there was a will, there was a way'.

The Research Team acknowledged, however, that finding quality CPD opportunities from the marketplace was not always an easy task. A means of assessing courses for their adequacy and relevance would be beneficial. This also suggests that development of material and a means of delivery could be beneficial- perhaps through the existing Construction Best Practice Clubs.

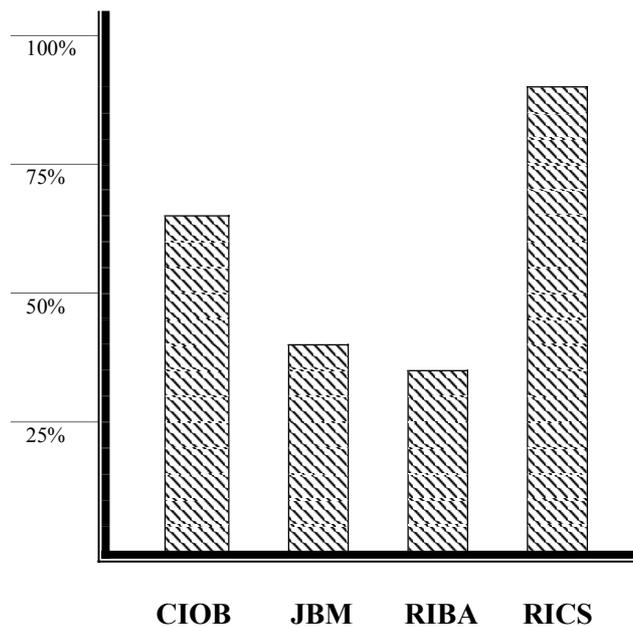


Figure 4 Staff taking up CPD opportunities relating to H&S risk management

Recommendation 7.6 (7)

Appropriate learning outcomes in H&S risk issues should be offered to vacation and year out placement students and Centres should negotiate with host companies to provide suitable training and experience to undergraduates in their care. Centres should monitor delivery and progress in order to maximise opportunities afforded by industrial experience.

This recommendation was not applicable to 39% of those Centres visited, as they did not offer year-out placements.

Of those Centres which did offer placements, 63% of these indicated that they structured their placements so that appropriate (health and safety) learning experiences occurred (subject to commercial availability).

Both the JBM and the RIBA have a protocol for the guidance of those involved in industrial placements.¹⁵ The provision of ‘health and safety training’ is specifically mentioned in the JBM document, but not in the RIBA guidance. (It should be noted however that ‘training’ or personal safety is not the point being made here, important though it is - the recommendation related to exposure to design or construction related risk management opportunities).

The view was expressed by some schools of architecture that employers would turn away from employing undergraduates if this was accompanied by stipulations as to what experiences they should receive. A number of these schools were developing methods (eg Blackboard) of interactive communication with those working in practice during their year-out so that specific issues, including health and safety, could be formally assessed.

This form of innovative approach could have significant benefits to the maintenance of links, monitoring of progress and exchange of information between Centre and undergraduate during the period of placement.

¹⁵ www.pedr.co.uk/empguide2.asp and www.jbm.org.uk (annex E)

Recommendation 7.6 (8)

Academia should endeavour to utilise Industry good will to bring contemporary practical experience and exemplars of good practice to construction undergraduate courses.

All but one of the Centres visited indicated that they had good relationships with industry and used them to good effect. This is a significant improvement compared to the Previous Report (50%). This assistance manifested itself through guest lectures or involvement in project work. Some Centres struggled to maintain these contacts in a commercial climate where practitioners were under pressure to maximise fee earning time, and where little encouragement was given by employers for contributing in this manner.

Although the input from industry generally included a health and safety element, sometimes exclusively (through a guest lecture for example), in the case of architecture this element appeared to be less assured with more emphasis being on general design input. It was noted that part-time lecturers brought contemporary industrial experience to bear as they were closer to industry than full-time lecturers. (Some Centres however were concerned over the amount of control required in respect of part-time staff).

One Centre utilised their industrial contact to provide CSCS training and also the supply of personal protective equipment for the undergraduates.

General Points Relating to the Recommendations in 7.6

For schools of architecture in particular, although many of the actions had not previously been implemented, the Research Team was informed that actions were now actively in hand, largely as a result of the new accreditation requirements.

5.2.3 Accreditation Board matters

The Research Team was pleased to note that, with one exception, all accreditation bodies now have detailed requirements for the inclusion of health and safety risk management within their undergraduate courses. This is considered to be a major step forward.

Although the Previous Report emphasised the desirability of having a largely unified approach to health and safety risk management, across all disciplines, this is not considered as important as having the base requirements in place in the first place. Although it was noted by one Centre, which was involved with a number of accreditation bodies, that these differing requirements could be problematic, this was not the general view.

The exception to the progress identified above relates to the RICS which does not prescribe any specific requirements within their courses, although they do spell out separately the need *to educate students at the outset of their careers about uncertainty, hazards, probability and risk* (Section 3.5). There is therefore an apparent ambiguity in this respect between the apparent wish to avoid prescription, and the clear message from the statement quoted. However, where RICS courses sit alongside courses accredited by others, typically CIOB, undergraduates tend to receive at least some health and safety risk management education to the more detailed and enhanced requirements of CIOB.

5.2.4 Other initiatives

45% of Centres were familiar with current industry initiatives to raise the profile of health and safety (such as the Rethinking Construction agenda) and with two specific initiatives in particular, ie the CIC health and safety champions proposal (29%) or the APS training module (23%) (Section 2.2 and Fig 5).

The Research Team made a point of alerting Centres to various initiatives, either in the presentation or in general discussion (Section 5.2.7 below). This information appeared to be well received. This suggests that specific contact, designed to inform a targeted academic audience of on-going health and safety initiatives and materials, might be welcome.

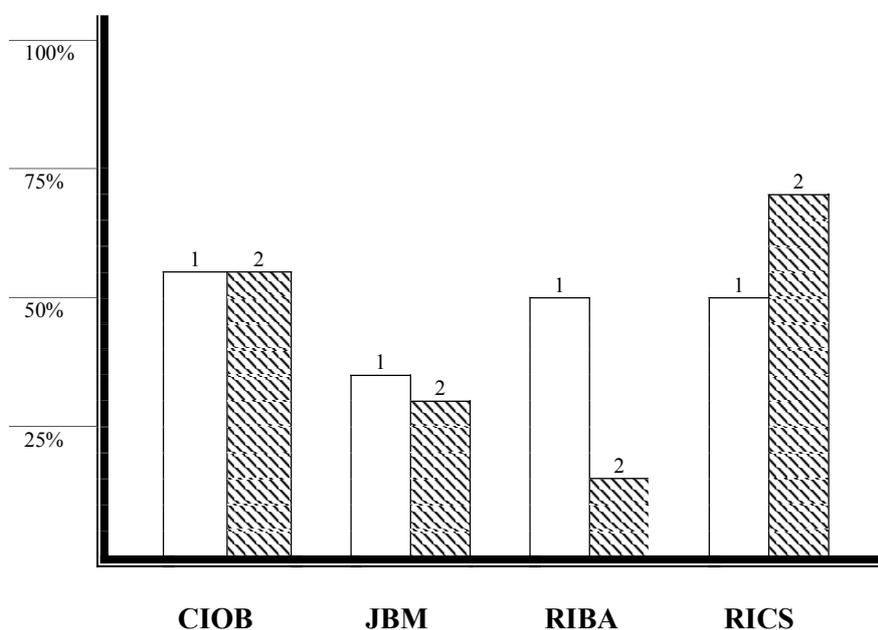


Figure 5 Knowledge of industry initiatives and the website

Col 1 knowledge of industry initiatives

Col 2 knowledge of website

5.2.5 Teaching-Aid website¹⁶

The HSE sponsored website, set up through Part B of the research project, was only known to 35% of those interviewed with significant variation when measured against accreditation bodies (Fig 5). This was disappointing as those who were aware of it, or who had reviewed it immediately before meeting the Research Team, were mostly complimentary in respect of its contents. Some did request that further data be added, in particular:

- the provision and clarity of case studies,
- questions to lead undergraduates through the case studies,
- photos, video clips,
- further information on ill health
- links to HSE accident statistics.

Of those who were aware, 55% of this group used it as a teaching tool, and 64% brought it to the attention of their undergraduates. In overall terms therefore the site still has limited exposure.

An analysis of the site usage shows that it is accessed throughout the year but with a particular increase in use in the Autumn term. Use during the first three months of 2004 shows a rising trend.

¹⁶ www.learning-hse.com

5.2.6 General comments

It was noticeable that a significant number of Centres had recently been re-organised or amalgamated into new discipline groupings, usually as part of an initiative instigated by the Vice-Chancellor or equivalent. These changes often had far reaching ramifications, affecting administration, research groups, and the rationalisation of undergraduate teaching. There were also some continuing changes in respect of semesterisation/modularisation.

As far as the Research Team could tell, the effects of these changes did not impinge directly on the delivery of health and safety risk management within the curriculum, and indeed they opened up the possibility of greater cross discipline teaching of this subject area. The additional workload and uncertainties however associated with changes of this type, clearly imposed additional burdens on all staff and had had some influence in the slow response described in Section 4.1.

5.2.7 Presentations

Only 26 % of Centres took up the offer of a presentation. Where these did take place, there was a useful exchange of views, with additional references, approaches, and background data being emphasised, which appeared to be of use to Centres. This data included:

- The suggested emphasis on ‘health and safety risk management’, and its place alongside other aspects of risk management.
- The website www.learning-hse.com
- The CIC Design Guidance for Designers (www.safetyindesign.org)
- The additional data included within the HSE website relating to designers (www.hse.gov.uk/construction/designers/index.htm)

Although not a formal part of the project, the Research Team felt that the benefit gained by those who elected to have a presentation was significant in helping to raise the profile of health and safety risk management, and to illustrate the wider benefits and opportunities of integrating health and safety risk management into the course. The fact that such offerings were seen to be valuable could suggest that a general initiative, as also mentioned in Section 5.2.4 could be helpful in developing health and safety awareness in construction related courses.

5.2.8 Good Practice and Ideas

As was the case during Part A, a number of examples of good practice, and some helpful ideas to assist the learning process, were mentioned by Centres during the visit programme. These are scheduled in Appendix 3 as a means of achieving wider dissemination.

5.3 FINDINGS RELATED TO OTHER RECOMMENDATIONS OF THE PREVIOUS REPORT

The implementation of these recommendations has been variable. The progress made, and the current applicability of the recommendation, has been taken into account in formulating the conclusions (Chapter 6) and recommendations (Chapter 7) of this report.

6. CONCLUSIONS

The Research Team concludes that some valuable progress has been made since the Previous Report¹⁷ was published. There are some encouraging signs that health and safety risk management is being embraced by Universities and Schools of Architecture, and there are examples of excellence in this respect. Overall there appears to be a greater acceptance than hitherto that ‘health and safety’ has to be included within the curriculum. Examples of progress would include:

- Positive changes to the requirements of accreditation bodies;
- Increased number of centres which are assessing undergraduates in health and safety issues.

Notwithstanding this assessment, progress is variable and:

- More needs to be done (as noted specifically below) in order that health and safety risk management is embedded into the curriculum in an integrated manner, as a matter of routine.
- A greater number of academic staff need to accept the essential role of health and safety risk management within the curriculum.
- Some Centres need improved and committed leadership in respect of the inclusion of health and safety risk management within courses, in order that this subject may be taken forward as recommended.

It appeared to the Research Team that those Centres that had studied the Previous Report (only 33% of those interviewed) had generally found it to be useful both in the detail, and in formulating a strategy for course development. Most of those who had utilised the website¹⁸ had also found it to be useful; only some 20% had used it as teaching tool or student resource however.

The need for academia, government bodies, institutions and industry, to act together in furthering this important subject area, remains essential.

Specific conclusions are:

- 1 There are some excellent exemplars of health and safety delivery, but these are not yet sufficiently widespread.
- 2 A number of heads of departments (or similar title) still do not yet appear to provide the requisite impetus in this field. It is unlikely that this subject area will be successfully integrated into a curriculum without support and explicit leadership.
- 3 As for Part A of this research project, the visits to Centres revealed a number of enthusiastic individuals who are trying (and succeeding in many cases) to integrate this topic into the curriculum for the benefit of the Centre as a whole. Unfortunately this commitment is still missing at some Centres.
- 4 The Research Assessment Exercise (RAE) continues to exert a negative influence upon this topic, particularly at Centres where it is seen as a diversion from the main declared focus of maintaining or improving research standards.

¹⁷ HSE Contract Research Report 392/2001

¹⁸ www.learning-hse.com

- 5 As stated in the Previous Report, there needs to be greater emphasis on the presentation of health and safety as *'health and safety risk management'*, and an understanding of how this is an integral part of corporate social responsibility and project risk management. The Research Team believes that it is only by taking this approach that the overall benefits to undergraduates will be realised.
- 6 62% of those Centres visited had implemented a course audit, in order to determine the current level and opportunities for the integrated inclusion of health and safety risk management. However, these were not always as comprehensive as they could have been in determining not only what was already provided, but where the opportunities lay for further integration and inclusion. Those Centres that had achieved this, in a methodical manner across the curriculum, had found it useful. Accreditation body validation requirements were often the driver in this respect.
- 7 87% of Centres assessed health and safety elements within courses. This is a significant improvement compared to the equivalent result obtained in Part A (43%). The Research Team believes however that at some Centres this was often selective and not necessarily tied into the outcome of a comprehensive audit identifying all opportunities for assessment.
- 8 Centres expressed mixed views in respect of the benefits of 'champions' where the role was taken on from within the department; fewer Centres had champions than was reported in the Previous Report. Where this reduction was due to a considered alternative approach there need be no concern, but the Research Team was not able to conclude that this was the reason. Nonetheless, it is considered that the use of a champion must be a Centre related decision, based on their own needs and staff profile. However, Centres do need to consider how the need to keep abreast of new developments in health and safety matters is addressed if no champion or similar focal point exists.
- The adoption of 'Awareness Days', where arguments both for and against such a provision have been presented, should also be a Centre related decision. Those Centres that provided such an experience were clearly convinced that it added value to the curriculum although some were concerned at the effort needed to organise the day.
- 9 At some Centres the Research Team found itself acting as facilitator for a productive discussion on health and safety risk management issues. This illustrated the benefit of open debate, and the potential role of champion, either internally or from industry, in order to provide the catalyst for change.
- 10 The take-up by academic staff of 'CPD' outside their research area, and in this topic area in particular, remains problematic. Keeping abreast of current thinking, new legislation, and industry practice is important, and for members of institutions a mandatory element of membership (although CPD may be acquired in a number of ways). Notwithstanding, the Research Team are sympathetic to the problem of identifying competent sources of CPD, and other advice, in the market place, and believes there is a need for the production and delivery of specific material for academia.
- 11 With regard to work placements, undergraduates now appear to work within well-regulated systems in respect of overall standards, outputs and opportunities. However, specific exposure to health and safety risk management will depend upon the willingness and interest of the practitioners, the commercial opportunities and the

vigilance of the Centre mentors. It was found that, of those Centres offering year-out placements, 63% made specific provision in respect of health and safety, which leaves room for improvement. The use of innovative IT based systems to monitor the provision of experience during the year, with possible assessment options, appears to provide an improved means of ensuring the adequacy of experience.

- 12 All Centres except one had contact with industry. This is a major advance compared to the position reported in Part A. It is believed this will bring long term benefits to the Centre. It was clear however that some Centres found it easier than others in maintaining this link at an active and participatory level. A strong partnership with industry is seen as a key element in the successful delivery of health and safety risk management. This is one area in which industry may play a valuable role and demonstrate the strength, and mutual benefit, of an 'academic-industry' partnership.
- 13 Since the Previous Report significant changes have been made to the requirements of most accreditation bodies in the field of health and safety risk management. Although the RICS itself does not have specific requirements in respect of health and safety at undergraduate level, their courses are often provided alongside those of CIOB. Where this occurs the health and safety content tends to satisfy the more detailed requirements of the CIOB. This should not obviate the need for each accreditation body to ensure their requirements stand alone.
- 14 The requirements of the accreditation bodies now generally provide a credible base on which Centres may develop their courses. The Research Team considers that the key issue for the future is ensuring Centres deliver risk management to these accreditation body requirements, in a quality assured manner, with appropriate assistance from industry.
- 15 Some health and safety elements are implicit within the accreditation body's requirements. There would be advantage if guidance could be given to Centres as a means of making these elements more explicit and ensuring consistency of approach.
- 16 Accreditation bodies need to ensure that their accreditation procedures and periodic reviews place sufficient emphasis on this subject area. Review teams should be competent to identify and assess the issues and have sufficient time to do so.
- 17 Those Centres that lack an awareness of broader industry initiatives and programmes, some of which (eg rethinking construction) have impacts beyond health and safety issues, are less able to bring contemporary thinking and experience to bear within the course, or to point their undergraduates towards fruitful areas of example or research.
- 18 Centres generally found the visit by the Research Team, and the presentation (if they had one) to be a valuable contribution to their understanding of some of the broader issues. There may be merit in considering how this benefit could be delivered to other Centres.
- 19 A number of organisations have implemented initiatives in respect of the higher education sector; these include the:
 - Accelerating Change in Built Environment Education (ACBEE) (exemplars of good practice)
 - Association of Planning Supervisors (APS) (training module)

- Construction Industry Training Board (CITB) and the Construction Confederation (CC) (educational literature and CSCS¹⁹ mobile test centre)

These are to be welcomed. Benefit would be obtained however by ensuring that they are co-ordinated in a way that presents a united front to academia, without losing the independence of the parties concerned.

- 20 Those that had used the website generally found it to be helpful and a beneficial tool. It is hoped that through this report its availability will become more widely known and its facilities better used.²⁰ Notwithstanding, the website needs to be subject to a programme of improvement and maintenance in order to keep it relevant to undergraduate and academia needs. In particular, specific requests were made by Centres for more, and better case studies based on typical projects that would attract undergraduate attention and interest. Clearly, these need to be replaced and supplemented on a regular basis.
- 21 On the whole, government and industry-led organisations have not assisted in moving this subject area forward as much as was anticipated. The Research Team hopes that, on the basis of this report's findings and recommendations, these bodies will now actively engage in contributing to the necessary task of integrating health and safety risk management into undergraduate construction courses.

¹⁹ *Construction Skills Certification Scheme*

²⁰ *There is a belief, albeit subjective, that industry has also found this site to be useful*

7. RECOMMENDATIONS

7.1 GENERAL

- 1 All five groups identified (and scheduled below) should review the recommendations of this report, with a view to establishing an action plan for their implementation.
- 2 A number of the recommendations from the Previous Report have been implemented; those which remain relevant, and which do not appear to have been advanced, are also included below.

7.2 GOVERNMENT BODIES

- 1 HSE should give consideration to initiating a follow-up workshop to the conference held in 1999 (Teaming Up for Education), which should be used to exchange views and information, to assist in the integration of the various current initiatives affecting academia, and to discuss future needs. This could be held on a regional basis to encourage attendance, particularly by those who are less committed to health and safety risk management within construction courses.
- 2 Measures should be put in place by HSE to ensure that the website produced as Part B of this study (www.learning-hse.com) is advertised, maintained and appropriately expanded to meet the needs of academia.
- 3 HSE should give particular emphasis to the further provision of case studies on the website. This could be achieved in part through the use of case study material obtained as part of the *Constructing Excellence* programme.
- 4 Greater emphasis should be given by HSE to the progression of ‘Action Point 34’ from the Revitalising Health and Safety Strategy Statement²¹ as a means of applying high level emphasis to this important area of education.
- 5 HSE should assist with the development of focused material for CPD delivery to academia at a local level. Ideally this should be undertaken in conjunction with industry.
- 6 HSE should act to bring this report to the attention of the relevant bodies, to monitor the implementation of all these recommendations, and to follow through as necessary.

7.3 ACCREDITATION BODIES

- 1 In view of its underlying importance, the accreditation bodies (CIBSE, CIOB, JBM, RIBA/ARB, RICS) should consider whether this subject area warrants the application of mandatory standards, which all undergraduates would have to satisfy, prior to progressing through levels of a course.
- 2 Centres should be asked to ensure that external examiners are specifically briefed to assess the adequacy of the health and safety risk management course content and its assessment.

²¹ See Section 2.1

- 3 RICS is encouraged to review its requirements for health and safety risk management course content with a view to bringing it into line with other accreditation bodies, and to remove the apparent anomaly within their documentation.²²
- 4 Accreditation bodies should consider the provision of guidance where reference to ‘health and safety’ within their documentation is not explicit.
- 5 Accreditation bodies should structure their review visit documentation requirements, such that Centres are obliged to indicate clearly what health and safety risk management is taught, where in the curriculum it occurs and how (if) it is assessed.
- 6 Accreditation bodies should take note, in due course, of the results of the:
 - HSE survey of universities,
 - CIOB survey of their accredited courses,
 - ICE Health and Safety Board survey,

for the provision of risk management.

7.4 INDUSTRY LED ORGANISATIONS

- 1 The Construction Industry Council (CIC) should complete the exercise of collating the various industry ‘champion’ and other initiatives (including for example the CITB’s work) so that a unified approach can be offered to Academia.
- 2 Bearing in mind the crucial need for industry champions to be apprised of the specific needs of academia, and for them to present a unified message, CIC should consider the production of ‘aims and objectives’ in this respect.

7.5 INSTITUTIONS

- 1 Institutions should monitor the success of their accreditation body requirements in this area by periodically obtaining the views of recent graduates after a period of exposure to industry practices. This can be achieved via questionnaires or similar techniques and is a relatively simple but effective way to establish the success of courses in delivering health and safety risk management.
- 2 Institutions should ensure that this topic remains ‘on the agenda’ via their committee structure and by practical action and interest at the highest level.

7.6 ACADEMIA

- 1 Those Centres that have not done so are urged to read the Previous Report, in conjunction with this report, as a means of initiating a debate on the adequacy of curriculum delivery in an integrated format, and with associated benefits.
- 2 Those Centres which have not yet undertaken a structured audit of their courses for ‘health and safety’ content and opportunity are urged to do so. Every endeavour should be made to use the results of the audit to identify a cross-curricula approach to the delivery of (health and safety) risk management such that it is fully integrated into the fabric of the course.

²² See Section 3.5

3 Heads of departments²³ should provide explicit support generally and should ensure that staff are signed up to the principle of integrated health and safety risk management, and that adequate CPD is acquired in order to achieve this aim.

4 Consideration should be given to identifying two components of course content in respect of health and safety, ie

Component 1 : mandatory for all students, formally assessed, and meeting the requirements of the relevant accreditation body and QAA benchmarks.

Component 2 : Applicable to all students, used to provide further example and to provide the cross-curricula emphasis, but not necessarily assessed.

Components 1 and 2 together should be of sufficient quantum and intellectual rigour so as to demonstrate the integrated nature of risk management in construction. This approach could be adopted for all risk management elements within a course.

5 Centres are urged to consider the benefits of utilising a facilitator (champion) to :

i) initiate debate and discussion within the Centre (mirroring the outcome of many of the Research Team visits) as a means of assisting Centres formulate a strategy; and

ii) provide a longer-term mentor/focus for on-going matters and developments.

The facilitator could be from within the Centre or an external advisor.

6 The terms of reference of external examiners, appointed by Centres, should include a specific mention of the need to assess the adequacy of health and safety risk management content within the overall course, and the means by which undergraduates are assessed.

²³ *Intended to refer to the person with ultimate responsibility for construction related courses.*

APPENDIX 1

EXECUTIVE SUMMARY (392/2001)

Recent statistics for accidents and fatalities in construction indicate a serious and worrying decline in the health and safety performance of the industry.

In this respect, the Safety Summit (Turning Concern into Action) called by the Deputy Prime Minister in February 2001, laid down a clear marker to the construction industry that it needs to drastically improve its health and safety performance and image. It was also made clear, although this should have been apparent, that all those involved in the construction industry in its widest sense have a role to play in this respect.

One element of the industry's response to this challenge concerns the education of aspiring architects, engineers, surveyors and builders who will eventually manage and lead this necessary change. Consequently, when they enter the world of work as the industry's future professionals, construction undergraduates need to be equipped with not only a basic appreciation of health and safety management, but also a fundamental understanding of its essential ethos and role in the overall management of risk.

The need for this educational underpinning is specifically stipulated in the joint Government/Health and Safety Commission Strategy Statement 'Revitalising Health and Safety' (DETR 2000a), which requires 'safety critical professionals' to have an 'adequate education in risk management'. This initiative is further emphasised by the Corporate Governance Group of the Institute of Chartered Accountants ('Implementing Turnbull'), which identifies the important role of risk management, and the health and safety element in particular, in the strategic management of business.

The academic phase in professional education is crucial in all of this and the contribution and support of Academia is vitally important. It is at the formative Educational Base that attitudes and perceptions are developed and the necessary analytical and critical abilities are inculcated enabling currently accepted industry practices to be challenged and reformed.

This report therefore describes a study into the current provision of health and safety teaching within undergraduate construction courses, and also touches upon the part played by Government, accreditation bodies, institutions, and industry organisations in the educational framework. The study covers all the major construction disciplines - architecture, building, engineering and surveying.

During the study, a total of thirty one Higher Education Centres were visited in order to meet both teaching staff and students, and these visits revealed that:

- There are some excellent examples of good practice and endeavour, and individuals who are making significant contributions. However, these individuals tend to be few in number.
- There is a significant number of Centres where the inclusion of health and safety into the curriculum is not actively supported by the head of department.

- Generally there is a willingness by staff to encompass health and safety risk management within courses but assistance is needed in respect of teaching aids and industrial input.
- Health and safety risk management is not yet widely recognised as an intellectual subject with a central role in construction risk management.
- Health and safety risk issues are generally not well integrated into the curriculum and undergraduates are not adequately assessed in this particular area of study.
- The management and provision of professional development opportunities for teaching staff in health and safety risk management topics is at best poor and generally non-existent.

As a consequence of these findings the report recommends that Academia:

- Embraces health and safety risk management as an integral and intellectual component part of the curriculum equivalent in all respects to the study of other risk management aspects of the construction process.
- Actively promotes the concept of a ‘health and safety champion’ within their staff complement who will initiate and lead the integration of health and safety risk management within all construction courses.
- Provides appropriate professional development for all construction professional staff to enable them to deliver the input required and provide active support for the ‘champion’.
- Works to maximise the links with Industry in order to develop intellectual exchange and learning opportunities for staff, students and practitioners alike, and in order to instil the business case for health and safety risk management in construction courses.
- Considers the concept of ‘health and safety awareness’ days to supplement the above.

The study also found, however, that the difficulties faced by Academia are exacerbated by the fact that accreditation bodies have widely varying, and mostly inadequate, requirements in respect of health and safety curriculum content. It also concludes that other influential bodies such as Government, professional institutions and industry organisations are not giving this subject the attention deserved.

The report therefore also recommends that:

- Government and Funding Agencies use their position to raise the profile of health and safety in the Higher Education sector.
- Those accreditation bodies that currently have minimal reference to health and safety review their requirements, and that all accreditation bodies actively work towards a pan industry approach.
- Health and safety be presented and taught as integral to the topic of construction risk management.
- Those institutions involved in the built environment work to significantly raise the profile of health and safety within their area of influence, particularly in respect of its relationship to the Education Base.

- An industry umbrella body such as the Construction Industry Council leads in developing a pan industry, standard curriculum template for health and safety risk management delivery in Undergraduate construction courses.
- Industry and Academia work together to maximise each other's skills and experience.
- That consideration is given to the introduction of a 'health and safety passport' for Undergraduates such that all those entering the industry have a common and adequate level of understanding that has been appropriately assessed.

In summary, therefore, all parties need to make a concerted and unified effort to actively develop and promote health and safety risk management as integral to the education of future construction professionals. This report strongly concludes that this can only be achieved by the joint endeavours of Academia and the wider construction industry working together with unity of purpose and a genuine desire to bring about the improvements demanded at the Safety Summit.

It is hoped that this report will act as a catalyst to this end as well as a useful reference document for all those involved in this important area.

APPENDIX 2

7. RECOMMENDATIONS (392/2001)

7.1 GENERAL

This study identifies that the quality of delivery and the support given to health and safety risk concepts within construction undergraduate courses is generally inadequate and, despite examples of good practice extant, substantial improvements need to be made on several fronts. The construction industry generally needs to recognise that all sectors have a part to play in this and that academia, government bodies, institutions, and interest groups are jointly and severally responsible for improving the current situation.

It has been established that there are individual examples of excellence and innovation in some Centres but also that a coherent and strategic approach is needed in order to universally develop and extend such initiatives to all providers of construction professional education.

Part of the strategy requires that those in positions of influence and responsibility assist Academia as it strives to satisfy the various and often competing demands placed upon it, and thereby enable the industry to respond in a unified manner to the challenges that have been set before it. We owe it to those following.

In order to avoid an uncoordinated and fragmented approach, a single body, representative of and accepted by construction as a whole, should in the first instance set out pan-industry guidelines. Furthermore, the Government, via its position as funding agent, should help to drive this through.

The suggested vehicle for this is Action Point 34 of the Revitalising Health and Safety Strategy Document.

In line with the above, health and safety should be repackaged and promoted as an element of 'risk management' as a means of, inter alia, presenting the subject as an intellectual challenge alongside other project risk considerations.

It is recognised, however, that any proposals to improve the current situation must:

- be pragmatic;
- recognise the real concerns and practical difficulties to be faced; and
- be owned by all participants.

In order that this investment for the future can bear fruit sooner rather than later, and in order also for it to be developed integrally with other current initiatives such as those generated by M4I, urgent attention is required by all those involved

The following recommendations are based on the conclusions derived from the study together with the impressions gained from the visits to the centres. They have been grouped so as to assist assimilation and identify those bodies with the ability to action them.

It is hoped that the following will serve as a draft agenda for action.

7.2 GOVERNMENT

1. DETR should implement Action Point 34 of the ‘Revitalising Health and Safety Strategy Statement’ as the high level driver of improvements to health and safety teaching.
2. The funding agencies (HEFCE, SHEFC, HEFCW) and the QAA should require inclusion of requisite health and safety matters within funded courses as a condition to receipt of funding.
3. HSE should increase their profile in this area by for example:
 - (a) considering an undergraduate/student page for their website;
 - (b) promoting the development of teaching material for use by universities/schools (commencing via Part B of this study);
 - (c) providing free literature and other information specifically geared towards the education sector.
4. HSE (with others as appropriate) should organise a conference involving all those with an interest in the Education Base, as a follow up to the 1999 ‘Teaming Up for Education’ conference. The issues from this report should be debated and action plans identified.

7.3 INDUSTRY GROUPS

The Construction Industry Council (CIC) should use their central representative position to lead, co-ordinate and support the recommendations stemming from this report. This could be done by using the existing CIB Memorandum of Understanding as a starting point.

The CIC should be encouraged to include organisations beyond their immediate membership, eg Senior Safety Advisors Group and the IOSH Construction Group.

1. The proposed review of the Common Learning Outcomes, contained within the CIB Memorandum of Understanding, should be used as an opportunity to strengthen and expand the existing requirement with respect to health and safety.
2. The revised learning outcomes should be based around a pan-industry template that allows universities/schools the essential freedom to incorporate the topic into courses as they wish but which is specific as to:
 - (a) syllabus coverage and attainment outcomes;
 - (b) the need for examination;
 - (c) the risk management context of health and safety.
3. Although the JBM and IChemE Guidelines are already well developed, other approaches that emphasise inputs as well as outcomes should also be considered. Whichever approach is taken it is important that the subject be presented in a risk management context with a suitable balance between practical application and intellectual underpinning.

4. The CITB and CIC in particular should act in tandem in order to achieve a coherent set of proposals. In this respect consideration should be given also to the concept of a 'passport' or 'Design Safe Certificate' for all those graduating - akin to the Construction Skills Certification Scheme (CSCS) - as evidence as to competence and as an entry permit to the workplace.
5. The Construction Confederation should use its position to identify contracting organisations willing in principle to afford Centres opportunities for organised site visits.
6. In order to identify and remove some of the difficulties experienced by Centres in organising site visits, consideration should be given to developing a site visit template/protocol through those involved with the M4I's Demonstration Projects.

7.4 ACCREDITATION BODIES

In order to improve the quality of undergraduate education in health and safety risk management, and in support of government initiatives such as 'Revitalising Health and Safety' and the Movement for Innovation's 'Commitment to People', the accreditation bodies should:

1. Work to harmonise their requirements with respect to academic coverage of risk concepts, in the form of pan-industry guidelines.
2. Recognise that, where specific risk issues are of concern to particular disciplines, these should be included in the curriculum in addition to the above guidelines.
3. Agree that learning outcomes be explicitly examined.
4. Present the discussion on health and safety in terms of 'risk management'.
5. Encourage the above to be realised via the CIB Memorandum of Understanding.

7.5 PROFESSIONAL INSTITUTIONS/INSTITUTES

1. All professional institutions acting within the built environment should give health and safety greater prominence generally, and in the Education Base phase in particular.
2. Professional Institutions should actively strive to raise the profile of health and safety at professional level and it is specifically recommended that:
 - (a) all institutions should have a health and safety board or similar as a focal point with adequate status within the committee framework so as to make a tangible impact;
 - (b) such boards should have the 'Education Base' high on the agenda;
 - (c) institutions 'sign up' to the concept of health and safety being of prime importance and demonstrate this in a visible way by, for example, a joint president's letter and action plan, and active support for CIC's common learning outcomes. [This would be in conjunction with other actions taken generally following the Health and Safety Summit (Feb 2001)];

- (d) institutions actively promote the concept of health and safety being part of risk management;
- (e) institutions ‘sign up’ to the concept of a health and safety ‘passport’ for graduates;
- (f) institutions use their influence and membership to actively assist academia in locating suitable industrialists willing to contribute as lecturers, mentors or assessors;
- (g) institutions re-emphasise the need for academic members to undertake CPD appropriate to their work;
- (h) institutions add a ‘student’ web page to their respective Web Sites in order to provide a focal point for health and safety topics and for other information of relevance to undergraduates.

7.6 ACADEMIA

1. Academia should recognise that health and safety risk is part of construction risk management and an essential intellectual element of all construction related courses.
2. Academic courses/programmes of study should be thoroughly audited with a view to including health and safety risk management in all built environment programmes as an integral and cross curricula element.
3. Health and safety elements of courses should be subject to specific assessment and this should be quality assured.
4. Health and safety ‘champions’ should be appointed, with appropriate status, as a means of achieving genuine co-ordination across the curriculum.
5. The concept of ‘health and safety awareness days’ (say one per year) should be considered as a supplementary means of introducing risk management in an intellectual and stimulating way.
6. Professional development opportunities should be provided for relevant staff having particular regard to their professional institution obligations and specific funding should be sought, if necessary, to assist in this respect.
7. Appropriate learning outcomes in health and safety risk issues should be offered to vacation and year out placement students and Centres should negotiate with host companies to provide suitable training and experience to undergraduates in their care. Centres should monitor delivery and progress in order to maximise the opportunities afforded by industrial experience.
8. Academia should endeavour to utilise Industry good will to bring contemporary practical experience and exemplars of good practice to construction undergraduate courses.

APPENDIX 3

Examples of good practice and approaches noted during visits to Centres. This should be read in conjunction with Appendix 2 of the Previous Report.

Item	Example
Practical design module	A module, developed by Imperial College in conjunction with a contractor, which involves the students in the construction of a (scale) bridge across water. Health and safety issues are made a key element of the site activities. (See NCE 29 May 2003, p38). Quoted by ACBEE as an exemplar.
Module descriptor sheets	Including a standard section on all module descriptor sheets to indicate what health and safety content is included within the module.
Lunch-time CPD sessions	Arranging for talks or videos on health and safety related issues for staff over lunch-time periods.
H&S Module developed in conjunction with industry	Edinburgh University has developed a module entitled 'Health and Safety Risk Management' in conjunction with AWG Construction Services (previously Morrison Construction). Quoted by ACBEE as an exemplar.
Undergraduate Induction	One Centre sends its first year undergraduates around the campus to identify poor examples of risk management. (If appropriate, these items are then brought to the attention of the University).
Funding of lecturing staff with industrial experience	One Centre utilises the university overhead resource in order to employ a lecturer with no research record but solid practical experience.
Role Play	Use of role play including that of 'risk manager' to act as a catalyst to discuss risk within the project.
Using high profile events	One Centre suggested that high profile awards such as Stirling Prize should have an explicit statement on health and safety issues so as to provide an exemplar case study for undergraduates.
Risk Management module	Use of a module to cover all aspects of risk (financial, resource, technical etc) and health and safety.

REFERENCES

(web addresses are given where the reference itself is currently available for downloading)

- 1 ACCELERATING CHANGE IN BUILT ENVIRONMENT EDUCATION (ACBEE) 2003
Prospectus
<http://ctiweb.cf.ac.uk/learning/acbee/prospectus.php>
- 2 CHARTERED INSTITUTE OF BUILDING (CIOB) 2002
Health and Safety Action Plan
http://www.ciob.org.uk/iande/health_and_safety.jsp
- 3 CONSTRUCTION INDUSTRY COUNCIL et al (CIC) 2003
Accelerating Change in Built Environment Education
<http://www.cebe.ltsn.ac.uk/learning/acbee/index.php>
- 4 CONSTRUCTION INDUSTRY COUNCIL (CIC) 2004
(Draft) Guidance on Graduate Common Learning Outcomes
- 5 DEPARTMENT FOR EDUCATION AND SCIENCE (DfES) 1999 (jointly with the Qualifications and Curriculum Authority)
Non-Statutory Framework for Personal, Social and Health Education
<http://www.nc.net/index.html>
- 6 DEPARTMENT OF THE ENVIRONMENT, TRANSPORT AND THE REGIONS, LONDON (DETR) 2000
Revitalising Health and Safety Strategy Statement
- 7 ENGINEERING COUNCIL (EC) 1997
Standards and Routes Towards Registration 3rd Edition
- 8 ENGINEERING COUNCIL (EC) 2003
UK-Spec: United Kingdom Standards for Professional Engineering Competence
<http://www.uk-spec.org.uk>
- 9 HAZARDS FORUM 2002
The Effectiveness of Undergraduate Risk Education
Seminar July 2002
<http://www.hazardsforum.co.uk>
- 10 HEALTH AND SAFETY EXECUTIVE (HSE) 2001a
The Identification and Management of Risk in Undergraduate Construction Courses. CRR 392/2001 HSE Books
http://www.hse.gov.uk/research/crr_hm/375-399.htm
- 11 HEALTH AND SAFETY EXECUTIVE (HSE) 2001b
Managing Health and safety in Construction
HSG224 HSE Books
- 12 HEALTH AND SAFETY EXECUTIVE (HSE) 2003a
Designers Can Do More Press release E234.03A- 21 November
<http://www.hse.gov.uk/press/2003/e03234a.htm>
- 13 HEALTH AND SAFETY EXECUTIVE (HSE) 2003b
Many Designers are unaware of their duties under CDM
Press release E066.03- 2 May
<http://www.hse.gov.uk/press/2003/e03066.htm>
- 14 HEALTH AND SAFETY EXECUTIVE (HSE) 2003c
Interim Paper from the AP34 Study Team defining 'safety critical' professionals
- 15 HEALTH AND SAFETY EXECUTIVE (HSE) 2004
A strategy for workplace health and safety in Great Britain to 2010 and beyond.
<http://www.hse.gov.uk>
- 16 HIGHER EDUCATION FUNDING COUNCIL (HEFCE) 2002

- Academic Staff: Trends and Projections*
<http://www.hefce.ac.uk/Pubs/hefce/2002/>
- 17 GOVERNMENT WHITE PAPER (HMSO) 2003 Command Paper 5932
The Future of Higher Education
 - 18 INSTITUTE OF DIRECTORS (IOD) 2002
Education and Training. A business blueprint for reform
 - 19 JOINT BOARD OF MODERATORS (JBM) 2003a
Internal Paper to Board 'Recruitment of Academic Staff' Prof Barry Clarke and Howard Stevens
 - 20 JOINT BOARD OF MODERATORS (JBM) 2003b
Annual Report 2002
 - 21 THE QUALITY ASSURANCE AGENCY FOR HIGHER EDUCATION (QAA) 2000
Engineering, Architecture, Architectural Technology and Landscape Architecture
<http://www.qaa.ac.uk/crntwork/benchmark/honours.htm>
 - 22 THE QUALITY ASSURANCE AGENCY FOR HIGHER EDUCATION (QAA) 2002
Building and Surveying
<http://www.qaa.ac.uk/crntwork/benchmark/honours.htm>
 - 23 ROYAL INSTITUTE OF BRITISH ARCHITECTS (RIBA) 2003
Tomorrow's Architects RIBA Books
 - 24 ROYAL INSTITUTION OF CHARTERED SURVEYORS (RICS) 2002
APC/ATC requirements and competencies
 - 25 ROYAL INSTITUTION OF CHARTERED SURVEYORS (RICS) 2003
The Management of Risk-Yours, Mine and Ours
<http://www.rics.org/ricscms/bin/show?class=ResearchReports&template=/includes/showresearch.html&id=67>
 - 26 STANDING COMMITTEE ON STRUCTURAL SAFETY (SCOSS) 2003
14th SCOSS Report. Chapter 5 www.scoss.org.uk/publications/



MAIL ORDER

HSE priced and free
publications are
available from:
HSE Books
PO Box 1999
Sudbury
Suffolk CO10 2WA
Tel: 01787 881165
Fax: 01787 313995
Website: www.hsebooks.co.uk

RETAIL

HSE priced publications
are available from booksellers

HEALTH AND SAFETY INFORMATION

HSE Infoline
Tel: 08701 545500
Fax: 02920 859260
e-mail: hseinformationservices@natbrit.com
or write to:
HSE Information Services
Caerphilly Business Park
Caerphilly CF83 3GG

HSE website: www.hse.gov.uk

RR 275

£10.00

ISBN 0-7176-2907-4

