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CDM Regulations: 12 years of pain but little gain

New Construction (Design and Management) Regulations were due out in the UK in April 2007, updating the original 1994 Regulations which came into force in 1995. This paper looks at the effects the original Regulations have actually had on the construction industry, particularly with regard to implementation costs and safety benefits. Analysis of site accident statistics shows that, despite having cost several billion pounds to implement, the Regulations have produced very little improvement in safety. It also appears that the EU research report which led to introduction of the regulations has been widely misrepresented, leading to unrealistic expectations about the effect designers can actually have on construction safety.

The Construction (Design Management) (CDM) Regulations 1994¹ were introduced in the UK in 1995 in response to an EU Directive² to reduce deaths and injuries on construction sites by changing design and management procedures (Fig. 1).

Although the Regulations have been in force for just over 12 years, surprisingly lit-

tle has been published assessing how they have operated and what their effects have been in practice. This paper considers how the requirements of the Regulations have been translated into reality, what effects they have had on the work of designers and contractors, and what effects they have had on construction safety.

The author is a practising engineer in a medium-sized firm of consulting structural engineers, working on the normal range of design projects (commercial new-build, alterations and refurbishment) and also remedial works and investigations into structural failures. This paper is based on his personal experience, discussions with colleagues, information gained from investigations of failures and discussions with others in the industry including engineers, architects, contractors and planning supervisors. The analysis of construction safety is based on statistics published by the Health and Safety Executive (HSE).

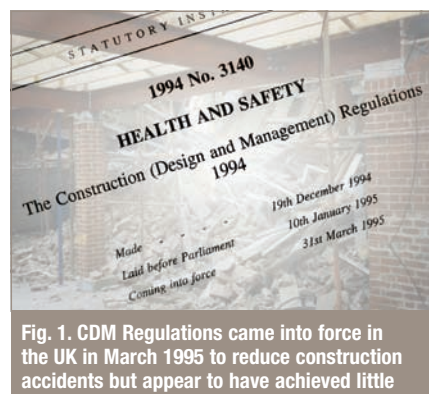


Fig. 1. CDM Regulations came into force in the UK in March 1995 to reduce construction accidents but appear to have achieved little

Experience of CDM in practice

The introduction of the CDM Regulations imposed various new duties on designers, including an obligation to try to 'design out' risks in construction work. They also created two new duty holders in construction projects

- the 'planning supervisor', who collects safety-related information from designers, passes it to the contractor before site work starts, and then collects safety-related information about the completed structure from the contractor and passes it to the client on completion (replaced by 'coordinator' in the revised 2007 Regulations)
- the 'principal contractor', who is responsible for health and safety coordination of contractors on site.

Planning supervisors

The CDM Regulations have required a planning supervisor (now known as a coordinator) to be employed on most commercial construction projects and many people now earn a living performing this role. The job title has caused confusion, as planning supervisors do not actually plan or supervise construction work. Also, although it is a statutory position, the Regulations did not set up a statutory body to regulate the profession or specify required qualifications or standards of competence for people carrying out the role. As a result, the planning supervisors vary in knowledge and competence and also in their interpretation of the Regulations. The planning supervisor's work is mainly carried out before construction work begins and after it finishes, with no direct involvement on site, so he/she generally has little influence over what actually happens there.

Despite these problems, some have managed to establish themselves as valued and useful contributors to construction projects. Unfortunately there are also planning supervisors who have taken an impractical approach, or who simply generate files of paperwork of no real value. It would be helpful to have a detailed survey of the industry to assess what 'added value' planning supervisors have contributed to construction projects. It may be difficult to separate the effects of

their contribution to construction safety from the contributions of others. However, if their work has brought about a significant improvement in safety, this should be apparent in the annual statistics for deaths and injuries collected by HSE.

Principal contractors

On most construction projects a main contractor takes charge of the site and other contractors are under its control as subcontractors. In this situation the duties of the principal contractor are already covered by the main contractor. However, on a site where several contractors are working independently without anyone in overall charge, or where a client or a project manager decides to employ tradespeople and trade contractors directly, without a main contractor, the legal requirement to appoint a principal contractor can bring much-needed order to the site.

In the author's experience there is sometimes confusion over the two roles, with contract administrators using the terms 'principal contractor' and 'main contractor' interchangeably in letters and contract documents, apparently unaware of the differences between the two roles. There is also sometimes confusion about who is allowed to act as principal contractor on a project. The 1994 Regulations (clause 6 (2)) stated clearly

'The client shall not appoint as principal contractor any person who is not a contractor.'¹

However, for some reason the 2001 HSE *Approved Code of Practice and Guidance*³ presented as 'good practice' two examples (numbers 24 and 35) where clients who are not contractors decide to act as principal contractor themselves, even though this would clearly contravene the Regulations.

It seems reasonable to insist that only someone who is a competent, experienced contractor should be permitted to take on the job of principal contractor, coordinating the work of other contractors on a construction site.

Designers

Although 'design' and 'designers' are central to the CDM Regulations, they were not clearly defined. Is 'design' always the

architect or engineer's permanent works design, or does it include the contractor's temporary works and organisation of the site? Does 'design' include only formal documents, such as construction drawings and specifications, or does it also include verbal communications, informal advice and changes made by site workers?

The 1994 Regulations (clause 2) state

'design in relation to any structure includes drawing, design details, specification and bills of quantities (including specification of articles and substances) in relation to the structure.'¹

Unfortunately they do not make clear what else the term includes, or what it does not include. Clause 2 also states that, in addition to permanent works, 'structure' could mean

'(b) any formwork, falsework, scaffold or other structure designed or used to provide support or means of access during construction work.'

Therefore 'design' covers not only the architect's or engineer's permanent works design but also the contractor's temporary works, and the term 'designer' must also include anyone who takes decisions about these. Clause 109 of the HSE *Guidance* which accompanied the 2001 *Approved Code of Practice*³ stated that

'In CDM the term 'designer' has a broad meaning.'

Clause 110 states that designers include

'anyone who specifies or alters a design, or who specifies the use of a particular method of work or material'.

Confusingly, however, clause 136 of the *Guidance*³ stated that

'Under CDM, designers are not required to: ... specify construction methods.'

Therefore, if the 2001 *Guidance* was accepted as a correct interpretation of the 1994 Regulations, anyone who specifies or alters a design or the use of a material is a designer but it is not clear whether specifying how work is to be done is considered

to be 'design'. However, it seems clear for CDM purposes that design includes both permanent and temporary works, and informal communications as well as the formal written documents listed in the Regulations, and designers include many other people besides engineers and architects.

Confusion over who are designers for CDM purposes is common in the industry. For example, an industry magazine recently claimed that the draft revised CDM Regulations would extend designer responsibilities to steelwork detailers,⁴ apparently unaware that under the 1994 Regulations they already had this responsibility.

The author has often found that contractors assume for CDM purposes that the designer is always the consulting engineer or architect who has designed the permanent works. This view is implicitly endorsed by publications, conferences, initiatives and news stories about CDM, which tend to focus almost exclusively on the role of architects and engineers as designers. However, if design also includes temporary works and if designers include anyone who alters or affects a design, then steelwork detailers, erection managers, project managers and contractors' site staff can also be designers and more attention should be given to their role.

A project may have numerous people acting as designers on it, leading to the 'multiple designer problem': many clauses in the *Approved Code of Practice and Guidance*⁵ made recommendations about what the designer should do without making clear which particular designer they were referring to (which was sometimes not obvious). Published articles have added to the confusion by arguing that, for example, the project structural engineer (as designer) should take on issues which are clearly the responsibility of others, such as demolition contractors or the contractor's temporary works designers.

Confusion about who is a designer for CDM purposes and which particular safety issues each designer is responsible for can lead to costly duplication of effort if all designers try to cover their position by issuing their own comprehensive list of safety precautions. Even worse, it can create a dangerous situation if a contractor fails to make his own assessment of risks because it assumes that someone else should have identified them.

Designer's duties

According to the 1994 Regulations clause 13(2):

'Every designer shall –
(a) ensure that any design he prepares and which he is aware will be used for the purposes of construction work includes among the design considerations adequate regard to the need –
(i) to avoid foreseeable risks to the health and safety of any person at work carrying out construction work or cleaning work in or on the structure at any time ...'.¹

This is an admirable idea in principle, which most designers would be happy to endorse. However, it should be remembered that the CDM Regulations are not just a statement of aspirations—their requirements are law and those who do not comply may be prosecuted and, if found guilty, named and shamed and subjected to heavy fines.

A good law is one which defines clearly what is right and wrong, in order to assist the state to prosecute wrong-doers and also to allow law-abiding citizens who wish to stay out of trouble to see where the line is drawn—and to defend themselves in court if they are wrongly accused. How do the 1994 Regulations measure up to the requirements of a good law?

It can be difficult for a designer to work out what the requirements of clause 13 mean in practice. There is no official guidance identifying which design concepts and details comply and which do not and there is no body such as building control to refer designs to for checking. It is left to the designer to analyse the risks associated with a design, decide whether they are acceptable and then, if necessary, modify the design until the level of risk is reduced to what is considered to be an acceptable level. However, there is little authoritative published information quantifying the risks associated with typical design concepts and details—and even if the designer does manage to calculate the risk, there is no agreed standard which defines what level of risk should be regarded as acceptable.

Published guidance often advises designers to give priority to identifying risks which can be eliminated. However the

risks which can be easily eliminated are often minor—and for other more serious risks, a design change which eliminates one risk may simply create another. In practice, rather than choosing between risk or no risk, the designer is often faced with having to choose between one risk and another different risk. If the structural form and construction method are standard and their associated risks are largely generic and well known, the only way for the designer significantly to alter construction risks may be by choosing a different form of construction. It could be argued, therefore, that more guidance is needed on the relative safety of different forms of construction. However, again there is little published authoritative guidance and the 2001 code (clause 125)⁵ even advised

'There is little to be gained by detailed comparison of construction techniques that present similar risks, for example whether to specify a steel frame or concrete portal building ...'.

Ultimately the only place a designer may be able to find out whether their design complies with the Regulations is in court following an accident. There, expert witnesses and lawyers, with the full benefit of hindsight, will analyse the merits of the design and debate whether the designer did everything reasonably practical that could have been done to ensure it 'included among the design considerations adequate regard to the need to avoid foreseeable risks' to health and safety.

The court hearings may take place years after the design was prepared, so unless designers have kept a detailed written account of all of the thinking that went into the design while it was being prepared, they will have had to rely on memory when answering questions. Ultimately, when everyone has had their say, there will be a decision about what the Regulations mean by 'adequate regard' to the 'need to avoid foreseeable risks' and a decision about whether the design complied with this requirement. These decisions will be taken by a judge and jury who may have no experience at all of design or construction.

The idea behind the Regulations is admirable but there are difficulties when it is applied as a law. It places major responsibilities on designers without providing any

practical way for them to establish precisely what is legal and what is not. Faced with this conundrum, some designers have gone to extremes, banning all sorts of things and specifying precautions against every conceivable risk, while others have simply decided to carry on as usual and hope for the best. It is easy to condemn both of these but they are understandable (and inevitable) responses from people trying to deal with a goal-setting law which does not tell them where its goalposts were. The situation is unsatisfactory from the point of view of safety and also from the point of view of fairness and justice.

Design risk assessments

Many planning supervisors have asked designers to provide 'design risk assessments' for contractors. Although clause 137 of the guidance accompanying the 2001 code of practice⁵ acknowledged that these were not formally required by the Regulations, nonetheless it advised designers to keep

'brief records of the points considered, the conclusions reached, and the basis for those conclusions',

warning them that if this was not done

'it is more difficult ... for designers to demonstrate that they have exercised reasonable professional judgement and complied with CDM.'

The *Management of Health and Safety at Work Regulations 1999*⁵ require employers to prepare risk assessments in the course of their work but these are usually internal assessments rather than documents for the use of others. Vast numbers of such documents are now prepared every year but there is little evidence that they have produced any significant benefits. According to HSE's 2005 draft revised guidance (clause 178)⁶

'Designers are not legally required to keep records of the process through which they achieve a safe design, commonly known as the Design Risk Assessment (DRA). This has led to the production of large amounts of paperwork listing generic risks and hazards,

most of which are already well known to contractors and are not significant in any sense.'

The questions of whether written design risk assessments need to be prepared by designers, whether these needed to be provided to contractors as part of the CDM process needs to be clarified in the revised Regulations.

Enforcement

The 1994 CDM Regulations have a poor record in the courts: there have been few successful prosecutions and HSE has suffered some embarrassing court defeats. A case against a structural engineer in 2004 took years to prepare but it collapsed after only a day in court.⁷

Although the engineer was innocent, he had to endure a lengthy prosecution process before this was established and the vagueness of the law made preparing a defence difficult. However, this vagueness is also a problem for HSE: a vague law is hard to enforce and this ultimately limits what it can achieve.

It should be noted that the 1994 CDM Regulations cannot be used in civil proceedings.

Pre-tender health and safety plan

The pre-tender health and safety plan was compiled by the planning supervisor and was supposed to provide information for contractors, including any unusual features of the design or unusual risks that might have been involved in its construction. (The draft 2007 Regulations have dropped the idea of a formal pre-tender health and safety plan but still require the CDM coordinator to collate information to pass to designers and contractors.) This was another key innovation of the 1994 Regulations, which in theory should have brought great benefits.

There appears to have been little published research about the benefits such plans have brought in practice. Contractors with whom the author has discussed the issue generally felt that they did not receive significantly more useful information than they did before CDM and they often received over-bulky files padded out with unnecessary material. It would be helpful

to have a detailed survey of contractors' experiences to assess whether these impressions are typical and to analyse how effective these plans have been in practice.

Health and safety file

The health and safety file is prepared after construction, usually by the principal contractor, and it collates information about health and safety risks in the completed structure. In practice, the information included tends to be broader, becoming more like a 'building manual', which is actually very useful.

This particular part of the CDM Regulations has turned out to be a valuable innovation which is worth retaining, regardless of other aspects. However, contractors are often lax about providing the necessary information for the planning supervisor to complete the file. This can leave the planning supervisor (who may have been employed by the contractor) in an invidious position, with legal responsibilities which he is powerless to fulfil. More enforcement action from HSE in this area would be helpful.

Safety: expectations

The introduction of the CDM Regulations in 1995 was accompanied by high expectations about the improvements in site safety they would bring. The Health and Safety Commission's (HSC's) 1992 consultation document⁸ estimated that they would reduce accidents by 33% on small to medium-sized sites and by 20% on large sites. In their published implementation strategy, HSE referred to 'the huge benefits that will come over the years.'⁹

Around the time the Regulations were being introduced, it was often claimed that a 1991 EU research report¹⁰ had shown that design was responsible for 35% of deaths on construction sites. This claim has been repeated many times since; for example, the chief executive of the Association of Planning Supervisors stated in 2004 that the EU report had found that 35% of site accidents were due to 'unsafe design'.¹¹ The findings of this EU report were again relied on in the 2004 National Audit Office (NAO) report on construction safety.¹² In a magazine interview, the HSE chief inspector of construction was

reported as attributing 60% of site deaths to bad design.¹⁵

Were these claims correct? In fact, the NAO report did not attribute 60% of site deaths to bad design. It actually said (para. 2.6) that

‘decisions made before building work begins, including, for example, during design, account for up to 60 per cent of fatal accidents’ (emphasis added).¹²

It is notable that a table in the NAO report which listed ‘typical’ construction site accidents did not include a single example of an accident caused by permanent works design.

Although the EU research report is now quite old, it influenced the development of the EU Directive on site safety which led to the CDM Regulations, and it also influenced expectations about what the Regulations might achieve in practice. Even today its analysis of the causes of site accidents is still widely referred to. It is therefore worth examining its findings in detail.

The various statistics quoted above all have their origins in a diagram in the EU report (fig. 2/18 on page 30).¹¹ This identifies the causes of fatal work accidents on construction sites as follows: 35% ‘design’, 28% ‘organisation’ and 37% ‘implementation’. However, these labels on the diagram refer to headings in the main text, where their meaning is explained.

The section headed ‘design’ reads as follows

‘Thirty-five per cent ... of fatal work accidents in construction are caused by falls ... These can be diminished mostly through architectural design and the design of equipment and materials and work stations.’

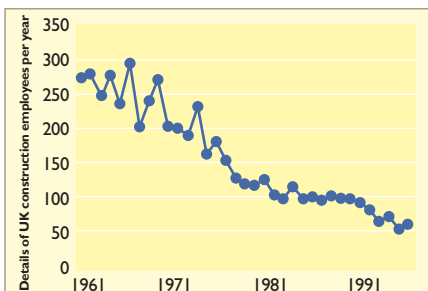


Fig. 2. Deaths of UK construction employees in the 25 years prior to the CDM Regulations were showing a strong downward trend

As can be seen, the text of the report did not actually say that 35% of deaths were caused by ‘architectural design’ (the term used for permanent works design)—it only identified this as one of several factors which could reduce deaths from falls. Table 2.3 of the report gave more details: of site deaths caused by falls, 12% could be prevented by ‘organisation’, 31% by ‘equipment design and organisation’ and 18% by ‘architectural design’.

Therefore, far from concluding that 35% of site deaths were caused by permanent works design, the EU report actually estimated that the proportion of site deaths which could be saved by making changes to permanent works design was only 18% × 35% = 6%.

It appears that the findings of this EU report have been seriously misunderstood and misrepresented. Correctly understood, they suggest that HSE’s 1992 expectations⁸ about the likely effects of the CDM Regulations on site safety may have been unrealistic.

Safety: reality

The official HSE accident statistics record the number of employees killed on construction sites each year.¹⁴ As can be seen in Fig. 2, deaths have fallen steadily since 1964.

- 1964–1974: deaths fell from 276 to 166—a 40% reduction.
- 1974–1984: deaths fell from 166 to 100—a 40% reduction.
- 1984–1994: deaths fell from 100 to 73—a 27% reduction.

The consistent reductions over the period 1964–1994 reflect changes in working

practices, improvements in site equipment and also the effects of the *Health and Safety at Work etc Act 1974*¹⁵ and other safety legislation (e.g. compulsory wearing of hard hats).

The period since 1995 has seen improvements in site machinery and high-level access arrangements (e.g. safety nets and high-level access platforms), which have made many previously hazardous tasks safer to carry out. Therefore, it would have been reasonable to expect further reductions in site deaths after 1995 even if no new legislation had been introduced.

The HSE’s statistics for deaths of construction workers (including self-employed) between 1985 and 2005^{16–18} are listed in Table 1, along with HSE’s published figures for major injuries from 1996 to 2005 (see also Fig. 3).

As can be seen, between 1985 and 1990 the death rate was fairly constant, averaging 137 a year, or 8.7 per 100 000 workers. However, from 1990 onwards it fell steadily and in 1994/5, the last year before the CDM Regulations, deaths were down to 83 a year, or 5.1 per 100 000 workers.

For the first seven years after the Regulations came into force, the annual death figures fluctuated between 65 and 105 without any consistent trend (average 83) and deaths per 100 000 workers varied between 3.8 and 6.0 (average 4.9). It was not until 2002 that casualties began to drop regularly below the 1994/5 figure: site deaths between 2002 and 2005 averaged 70 per year (3.6 deaths per 100 000 workers).

Changes in accident reporting rules mean that major injury statistics from 1996/7 onwards cannot be compared directly with earlier years. In 1996/7 (the second year of the CDM Regulations),

Table 1. HSE statistics for deaths and injuries of construction workers in the decades prior to and after introduction of the CDM Regulations (see Fig. 2)

| Pre-CDM | | | | | | | | | | |
|------------------------------------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|
| Year | 1985 | 1986/7 | 1987/8 | 1988/9 | 1989/90 | 1990/1 | 1991/2 | 1992/3 | 1993/4 | 1994/5 |
| Deaths | 126 | 125 | 143 | 137 | 154 | 124 | 100 | 96 | 91 | 83 |
| Deaths per 100 000 workers | 8.6 | 8.6 | 9.3 | 8.5 | 8.6 | 7.1 | 6.2 | 5.9 | 5.7 | 5.1 |
| Post-CDM | | | | | | | | | | |
| Year | 1995/6 | 1996/7 | 1997/8 | 1998/9 | 1999/0 | 2000/1 | 2001/2 | 2002/3 | 2003/4 | 2004/5 |
| Deaths | 79 | 90 | 80 | 65 | 81 | 105 | 80 | 70 | 71 | 69 |
| Deaths per 100 000 workers | 5.0 | 5.6 | 4.6 | 3.8 | 4.7 | 6.0 | 4.4 | 3.8 | 3.6 | 3.5 |
| Major injuries | — | 4054 | 4326 | 4656 | 4749 | 4708 | 4595 | 4721 | 4728 | 4496 |
| Major injuries per 100 000 workers | 254 | 251 | 272 | 273 | 265 | 253 | 258 | 239 | 229 | — |

there were 4054 major injuries (254 per 100 000 workers). After this the injury rate increased, reaching a peak of 4749 a year in 1999/2000 (273 per 100 000 workers) before reducing again in 2004/5 to 4496 a year (229 per 100 000 workers). The annual number of major injuries has remained above the 1996/7 figure throughout the period and it was only in 2003/4, eight years after the CDM Regulations came into force, that major injuries per 100 000 workers fell below their 1996/7 level.

Thus, for the first seven years of the CDM Regulations, the average site death rate remained the same as the year before they came into force and average deaths per 100 000 workers showed only a 4% reduction. From 2002 onwards, the situation improved, with a 15% reduction in average deaths and a 27% reduction in deaths per 100 000 workers. Detailed analysis of the accident records would be necessary to establish the reasons for this improvement. However, the change did not occur until seven years after the CDM Regulations came into force, so the possibility must be considered that some other factor was responsible.

Since 2000 there have been major changes in site working practices designed to reduce the dangers of working at height and this would provide a logical explanation for the reduction in site deaths from 2002 onwards. In the circumstances it seems unlikely the CDM Regulations were the primary reason for the post-2002 reduction in site casualties.

As noted earlier, site deaths fell by 40% in the years up to 1995 and improvements in site equipment since then mean that it would have been reasonable to expect site deaths and injuries to fall further after

1995, even if the CDM Regulations had not been introduced. In addition to CDM, there were two other major pieces of legislation, the Construction (Health, Safety and Welfare) Regulations 1996¹⁹ and the Management of Health and Safety at Work Regulations 1999.⁵ There were also several high-profile initiatives by HSE and others to improve construction safety. In the circumstances, the lack of any significant reduction in site deaths and injuries between 1995 and 2002 is rather disturbing.

It appears that the CDM Regulations failed to produce the 20–33% reduction in site accidents which was originally predicted. For the first seven years of the Regulations, average death and injury rates hardly changed at all and it seems likely that the improvements since 2002 have been caused by changes in site working practices, rather than the 1995 CDM Regulations. Therefore, on the basis of the available evidence it appears that the CDM Regulations have not had any significant effect on the number of deaths and injuries on construction sites.

Implementation costs

In its 1992 consultation document,⁸ HSC estimated the total annual cost of implementing the CDM Regulations as about £550 million, with extra costs for designers of up to £290 million and extra costs for planning supervisors and contractors of up to £185 million each. However, HSC also estimated that the Regulations would reduce site accidents, generating a saving of £220 million per year, and it was also believed that the management procedures introduced by the Regulations would improve productivity and quality, generating further benefits. Taking everything into

account, HSC considered that

‘the costs and benefits arising from the Regulations are likely in practice to be at least in balance’.⁸

There has been little published analysis of how the costs of implementing the CDM Regulations have worked out in practice. The total cost of planning supervisors’ fees, designers’ risk assessments, pre-tender health and safety plans, construction-phase health and safety plans and so on probably has amounted to several hundred millions of pounds per year.

However, as discussed above, the main anticipated benefit of the Regulations (the expected reduction in site accidents) does not appear to have materialised. There also appears to be little evidence that the management procedures introduced by the Regulations have generated further savings by improving quality and efficiency. It seems unlikely that the Regulations have produced benefits which outweigh the costs of implementing them.

It would be helpful to have a detailed independent survey and analysis carried out to establish the true costs and benefits. It would also be interesting to compare the safety benefits created by the CDM Regulations with the benefits which might be achieved if the same amount of money were spent in other ways (e.g. by increasing the number of HSE inspectors and improving their pay and training).

Competence

The 1994 and proposed 2007 CDM Regulations both require all parties involved in the construction process to be ‘competent’ and this has led to various schemes being launched to assess competence. For reasons which are not clear, much of the attention seems to have been focused on developing new training and assessment schemes for architects and engineers, even though these professions already have well-established education systems, training schemes and professional examinations.

If new training schemes and competence standards are to be developed, it would make more sense to focus attention on less-regulated groups, such as contractors’ staff and planning supervisors/coordinators.

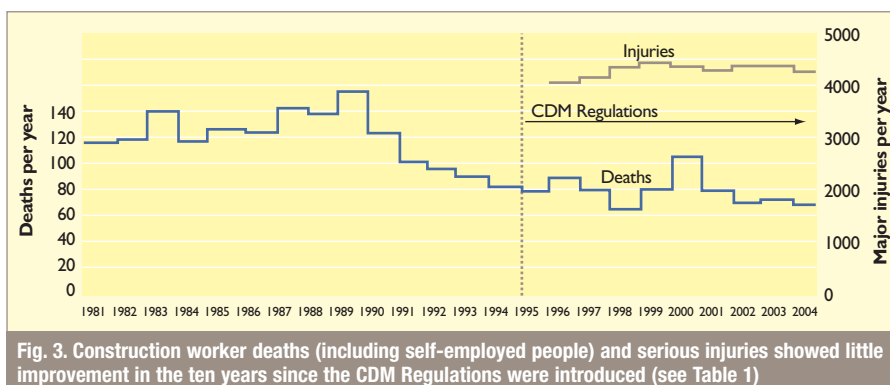


Fig. 3. Construction worker deaths (including self-employed people) and serious injuries showed little improvement in the ten years since the CDM Regulations were introduced (see Table 1)

Conclusions

The CDM Regulations were launched in 1995 with high hopes that they would improve construction efficiency and quality and bring about a major reduction in construction accidents. In practice, some parts of the Regulations (such as the health and safety file produced at the end of a project) have proved to be useful, but the benefits from other parts are harder to identify. There is a need for a comprehensive survey and analysis of the working of the Regulations in practice, identifying the parts which have worked well and those which have not.

The EU report on construction site safety which the Regulations were based on has been widely misquoted. Rather than blaming designs by architects and engineers for 35% or 60% of site deaths, it actually estimated the potential for reducing site deaths by changing their designs as only 6%.

Between 1989 and 1995 (the last years before the Regulations came into force) the site death rate fell from 154 to 83, a reduction of 46%. However, in the first seven years of the CDM Regulations, annual deaths varied between 65 and 105 with an average of 83, the same as the year before the Regulations were introduced. Reported major injuries actually increased during this period. Since 2002 there has been a fall in site deaths but this is probably attributable to changes in site working practices rather than the CDM Regulations.

These are disappointing results. The reductions in deaths of 20% on major sites and 33% on smaller sites predicted when the Regulations were introduced have failed to materialise. It appears that the 1994 CDM Regulations have failed to bring about a significant reduction in site deaths and serious injuries on construction sites.

There will no doubt be many different opinions about the reasons why the Regulations have failed to produce the results which were hoped for—and about what should be done about this. Some possible alternative explanations are listed below.

- There was nothing wrong with the 1994 Regulations—the fault lay with designers for failing to make them work.
- The intentions of CDM were good but they were poorly implemented in the Regulations.
- Construction work can never be made

completely safe and the scope for further reductions in death and injury rates is limited.

- HSE has been targeting the wrong ‘designers’. The main influence on safety is not architects and engineers but the people who ‘design’ how work is done on site and design the temporary works (including where there is no formal design).
- The assumption that permanent works designers can have a major influence on site safety is wrong. Site safety is primarily the contractor’s responsibility.
- CDM paperwork, such as health and safety plans, risk assessments and so on, serves little useful purpose and distracts attention from more important matters, such as what people *think about, talk about and do* when they are on site.

No doubt there will be different opinions about the relative merits of these views—and which are correct and which are wrong. More research into the operation of the Regulations in practice would be helpful in determining the truth of the matter.

In the mean time, revised Regulations are being introduced which replace the planning supervisor with a ‘CDM coordinator’ and place new safety responsibilities on clients. Will CDM 2007 succeed where the 1994 Regulations have failed? Time will tell.

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