

Work at Height Regulations
Regulatory Impact Assessment (Final)

Purpose And Intended Effect

Issue

1. The Work at Height (WAH) Regulations address all aspects of work at height including the selection and use of work equipment, and the way the work is planned, organised and managed. The regulations are intended to minimise the risk of falls whilst working at height, which is one of the most common causes of fatalities and injuries at work. The proposed regulations implement the requirements of Directive 2001/45/EC amending Council Directive 89/665/EC.

Risk Assessment

2. This section outlines the risk to workers while working at height and provides historic accident data. The risks associated with working at height are provided first at a general level and secondly for specific sectors affected by the proposed regulations.

All Falls From Height

3. Table 1 shows the number of fatalities from falls reported to all enforcing authorities. Almost half of these injuries occur in construction.

Table 1: Number of fatal injuries to workers due to falls from a height 1996/97 to 2003/04p¹

Year	Employees	Self-employed	Total
1996/97	56	32	88
1997/98	64	28	92
1998/99	48	32	80
1999/00	43	25	68
2000/01	47	27	74

¹ The figures for 2003/04 are provisional.

2001/02	53	16	69
2002/03	35	14	49
2003/04p	48	19	67

4. There are also a large number of non-fatal injuries caused by falls from a height. The actual number of non-fatal injuries may be higher than the numbers reported because the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) is subject to under-reporting (the current level of reporting has been estimated at 41% using the Labour Force Survey). It should also be noted that the reporting categories changed in 2001/02² and this may give the false impression of a step reduction in the number of major injuries.

Table 2 Reported number of Major Injuries To Workers Due To Falls From A Height 1996/97 To 2002/03

Year	Employees	Self-employed	Total
1996/97	5 023	496	5 519
1997/98	5 382	325	5 707
1998/99	5 454	275	5 729
1999/00	5 500	275	5 775
2000/01	5 286	266	5 552
2001/02	4 066	356	4 422
2002/03	3 880	376	4 256

² Overall the proportion of major injuries due to 'falls from a height' accidents had remained steady until 2000/01. It has since dropped, which may in part be due to the new guidelines. Some major injuries that previously counted as falls from height are now counted as slip and trips. The main decrease in the number of falls relate to falls from surfaces such as floors, pavements, stairs and steps. These are areas where the new guidelines clarify the distinction between a slip/trip on the level and a fall from a height. In addition, the new guidance emphasises the recording of the hazard of working at a height for example when an injured person slips at height and then falls to a lower level.

Table 3 Number Of Over-3-Day Injuries To Workers Due To Falls From A Height 1996/97 To 2002/03

Year	Employees	Self-employed	Total
1996/97	8 492	324	8 816
1997/98	8 452	163	8 615
1998/99	8 452	137	8 589
1999/00	9 019	116	9 135
2000/01	9 023	127	9 150
2001/02	5 459	146	5 605
2002/03	4 910	145	5 055

Ladders

5. Falling from ladders accounted for 19% of fatal and 32% of major falling from height injuries in 2001/02. Statistics indicate that there are around 14 fatalities and 1,200 major injuries reported to HSE each year due to falls from ladders. The construction industry has accounted for around 40% of falls from ladders in the past five years. A significant proportion of injuries also occur in the service and manufacturing industries with window cleaners accounting for around one third of falls from ladders in the service sector.
6. Statistics indicate that there are an average of 4 fatalities amongst window cleaners due to falls from height each year (the majority of these will involve ladders).

Scaffolding

7. In 2001/02 there were 11 fatalities to workers as a result of falls from scaffolding. Around half of these fatalities were caused by faulty platforms or access problems. In 2001/02 there were also 222 major injuries to workers as a result of falls from scaffolds.

Rope Access

8. Figures from the Industry Rope Access Trade Association (IRATA) Annual Survey 1999, which is based on a sample of its members, indicate that there were no fatal injuries, three reportable injuries, 29 non-reportable minor injuries and 10 dangerous occurrences while working using rope access. IRATA believes that its members are comparable with the best performers in industry as a whole.

Objectives

9. The directive aims to reduce injuries as a result of falls from a height by addressing all aspects of work at height i.e. how work is planned, organised and managed. The Work at Height Regulations will also address training requirements and, the selection and use of equipment.

Options

10. Three options were considered for implementation of the directive:
11. (a) A single set of self-standing regulations applying to work at height in all sectors of industry.
12. (b) An amending set of regulations to the Provision and Use of Work Equipment Regulations 1998 (PUWER) implementing the ladder and rope access requirements of the directive, combined with amending the relevant parts of the Construction (Health, Safety and Welfare) Regulations 1996 (CHSWR) relating to scaffolding and applying these to all industry sectors.
13. (c) A set of regulations for work at height for all industries apart from construction, with-related amendments to CHSWR.
14. HSC chose option (a). The relevant sections of sector specific legislation such as the CHSWR would be revoked. This was seen as the simplest and most transparent route and, from a legal and enforcement point of view, the most straightforward option. It was also seen as the option that would place the least familiarisation burden on industry. During the initial round of consultation, the construction industry expressed concerns that the chosen option would result in standards of safety in construction being weakened through lack of detail. HSC has given a commitment that legal standards will be maintained and/or improved.
15. Option (b) was not chosen as experience has shown that merely amending regulations as opposed to issuing new ones greatly lessens the impact of the legislation. Given the number of fatalities and injuries caused by falls from height HSE wants the proposed regulation to have an impact. There was also concern from a legal standpoint that simply extending the scope of the existing CHSWR to all sectors would not give an accurate indication of the nature of the instrument.
16. Option (c) was not chosen as the major difficulty with having separate sets of regulations for construction and other industries would be confusion on the part of duty holders as to which regulations applied to them (possibly both in some cases), and difficulties for enforcers (HSE and Local Authorities) in applying a complicated regime.

Background Information And Assumptions

17. Information on the costs and benefits of the proposed Work at Height Regulations has been obtained from relevant industry representatives, sources within HSE, the Department for Transport's Economic Note No. 1 (2002)³, 'The costs to Britain of workplace accidents and work-related ill health in 1995/96'⁴ (HSE, 1999), HSC's Annual Report on Falls From Height⁵, the Small Business Service's statistics on small and medium sized enterprises and the New Earnings Survey.
18. Some costs to businesses are opportunity costs reflected by lost output as a result of carrying out new duties. It is assumed that the value of this lost output is equal to the time spent carrying out the new duties multiplied by the average wage (adding 30% for non-wage labour costs including superannuation and employers' National Insurance contributions).
19. Both costs and benefits have been discounted in line with Treasury guidance. Costs have been discounted at a rate of 3.5%. Health and safety benefits have been uprated by 2%, then discounted at 3.5%, giving an effective discount rate of 1.5%. Costs and benefits are calculated over a period of ten years and expressed in present value terms.
20. All costs and benefits have been discounted back to a base year of 2000. The choice of base year does not affect the balance of costs and benefits, or the conclusions of this analysis.
21. To estimate the cost of the proposed regulations it has been assumed that there will be full compliance. This assumption is relaxed in the uncertainties section.

BENEFITS

Health And Safety Benefits

22. Since falls from a height accounted for around 22% of fatal injuries and around 14% of major injuries to workers in 2002/03⁶ the potential benefit of preventing these injuries is significant. HSE research has shown that the cost of a workplace accident is higher than is immediately obvious. The individual faces costs in terms of pain, grief and suffering, and loss of income. Employers face costs in terms of lost output, equipment damage and disruption. There are also resource costs to society in terms

3 http://www.dft.gov.uk/stellent/groups/dft_rdsafety/documents/page/dft_rdsafety_026183.hcsp

4 ISBN 0717617092

5 <http://www.hse.gov.uk/statistics/pdf/rhsfall.pdf>

6 HSC's Annual Report on Falls From Height 2002/03.

of medical treatment and social security administration (social security payments and compensation payments are excluded because they are transfers and not resource costs).

23. The total cost of injuries and fatalities as a result of falls from height has been estimated at £458 million per year⁷. This has a present value of £4,287 million over the appraisal period.
24. The proposed regulations are aimed at increasing safety in all aspects of working at height. They require: "every employer, in selecting work equipment for use in work at height shall take account of the working conditions and to the risks to the safety of persons at the place where the work equipment is used".
25. The HSC's Falls from Height Priority Programme is aiming for a 10% reductions in falls from height over ten years from 1999 to 2010. If the introduction of the proposed regulations brings about a 10% reduction in the cost of injuries, the benefit would be approximately £46 million per year. This has a present value of £429 million over the appraisal period.

COSTS

26. Most of the duties set out in the regulations are not expected to have major cost implications for individual businesses because businesses currently employing good

7 It has been assumed that the number of fatal, major and over three day injuries per year during the appraisal period is equal to the average number of fatal, major and over three day injuries in 2001/02 and 2002/03. The number of non-fatal injuries has been adjusted for under reporting. 2003/04p data is available for the number of fatal injuries but not the number of major or over three day injuries. To maintain consistency data from 2003/04p has not been used to estimate benefits. If the number of fatal injuries in 2003/04p were included in the estimation of benefits, the level of benefits would increase because the number of injuries in 2003/04p is greater than the average number of fatal injuries in 2001/02 and 2002/03.

The unit cost of fatalities has been taken from the Department for Transport's Highways Economic Note No. 1 (2002). Human costs and lost output costs have been downrated using nominal GDP per capita. Medical costs have been downrated by the Department of Health's Pay and Prices index. The values used are: £763,400 for human costs, £400,300 for lost output and £700 for medical costs.

The unit cost of major injuries has been estimated as follows. Human cost has been taken from HSE's GAP 23 uprated by nominal GDP per capita. Lost output has been taken from 'The costs to Britain of workplace accidents and work-related ill health in 1995/96' (1999) uprated using the New Earnings Survey earnings index. Resource cost has been taken from 'The costs to Britain of workplace accidents and work-related ill health in 1995/96' (1999) uprated using the New Earnings Survey earnings index. The values used are: £13,900 for human costs, £12,900 for lost output and £4,600 for resource costs.

The unit cost of over three day injuries has been estimated as follows. Human cost has been taken from HSE's GAP 23 and uprated by nominal GDP per capita. Lost output has been taken from 'The costs to Britain of workplace accidents and work-related ill health in 1995/96' (1999) uprated using the New Earnings Survey earnings index. Resource cost has been taken from 'The costs to Britain of workplace accidents and work-related ill health in 1995/96' (1999) uprated using the New Earnings Survey earnings index. The values used are: £2,000 for human costs, £2,100 for lost output and £400 for resource costs.

practice are likely to already meet the requirements. A small number of businesses not currently employing good practice may face significant costs.

Business Sectors Affected

27. The proposed regulations will affect all sectors where workers carry out work at height. The proposed regulations will specifically affect the self-employed and businesses whose employees use ladders, scaffolding and rope access equipment. The businesses affected will predominantly be those involved in construction and steeplejacking, window cleaning, arboriculture, agriculture, utilities, retail, ship building, manufacturing and the occupational group of maintenance/ industrial cleaners. Not all workers in these sectors will necessarily carry out work at height.
28. The construction industry employs 1.6 million workers. The proposed regulations overlap with existing construction regulations in Great Britain: the Construction (Health, Safety and Welfare) Regulations 1996 (CHSWR). Consequently, it is expected that the proposed regulations will have a limited impact on the construction sector. This expectation also holds for the 500 steeplejacks operating in Great Britain who are also covered by CHSWR. Additional costs and benefits are possible if the proposed regulations raises compliance with existing regulations but this is not expected. Hence, only familiarisation costs have been estimated for the construction sector.
29. The Labour Force Survey indicates that there are 35,000 window cleaners in Great Britain whereas the National Federation of Window Cleaners and General Cleaners estimates this number to be 185,000. It has been assumed that there are 150,000 window cleaners in Great Britain. Due to accessibility factors most domestic window cleaners are unlikely to be able to improve their working practices but many are expected to purchase additional stabilisation equipment. Business could also insist window cleaners use access equipment, especially in shopping centres and office complexes. This would mean some larger window cleaners could have significant equipment and training costs.
30. The Arboriculture Association has 1,850 members, but estimates that there are between 12,000 and 20,000 arboriculturists in Great Britain. They believe that as long as guidance is interpreted correctly, i.e. follow good climbing practice, there should be no significant additional costs.
31. There are approximately 390,000 people employed in agriculture in Great Britain. Agriculture does not have specific regulations covering work at height so the proposed regulations could potentially have a significant impact.

32. The telecommunication industry is served mainly by British Telecommunications (BT), which already follows good practice with regard to ladders. The major costs for BT will come from selecting safer methods for work at heights i.e. using Mobile Elevated Work Platforms (MEWPs). Utility businesses such as electricity and gas are likely to have different costs, such as purchasing stabilisation equipment.
33. There are 2.7 million people employed in retail. Most retail outlets, especially larger chains, are likely to be following good practice so will not be significantly affected by the proposed regulations. There may however be some additional stabilisation equipment costs and there may be a greater move towards the use of MEWPs.
34. There are around 600,000 workers employed as cleaners or domestics in Great Britain. Only a small proportion of these are industrial cleaners. There are also a similar number of people employed as maintenance workers. As a result of the proposed regulations there may be additional training and some purchasing of stabilisation equipment costs. Larger premises may insist on their maintenance and cleaning staff using MEWPs for some work at height.
35. To estimate the cost of the proposed regulations to business the costs across all industries have to be calculated. As these proposed regulations could potentially impact on all industries it would be inaccurate to estimate costs based solely on the specific industries discussed above. Instead, the number of people working at height across all industries has been estimated and assumptions have been made about the changes that will be brought about as a result of the proposed regulations.
36. It is extremely difficult to estimate the number of people working at height because there are a large number of sectors in which people work at height. The British Association of Ladder Safety Equipment Manufactures (BALSEM) has estimated that there are around 10 million ladders in Great Britain with half of these in industry. This figure does not however indicate the number of people who use ladders as part of their job on a regular basis. The Ladder Stabiliser Manufacturing Association has estimated the number of people employed in work where the use of ladders is an essential requirement at between 2 and 3 million. The British Ladder Manufacturing Association (BLMA) has estimated that between 2.5 and 3 million workers work in a job where the use of ladders is an essential requirement. The BLMA's estimate is the one used in this RIA.
37. The estimated number of workers working with ladders includes workers in the construction sector. It has been assumed that all of the 1.6 million workers employed by the construction industry will work with ladders. Hence, the number of workers outside construction working with ladders, and therefore working at height, can be roughly estimated at between 0.9 and 1.4 million. Excluding familiarisation, the costs

in this RIA have been estimated using the estimated number of workers outside the construction industry working at height.

38. In addition to people working at height with ladders there are a number of workers working at height on ropes. Figures from IRATA (Industrial Rope Access Trade Association) indicate that there are approximately 15,000 people working using rope access in Great Britain.

Total Compliance Costs to Businesses

Familiarisation

39. Familiarisation is assumed to involve a manager earning an average of £20 per hour (including non-wage labour costs).
40. The exact number of businesses where workers carry out work at height and therefore managers will need to familiarise themselves with the proposed regulations is uncertain. It has been assumed that all construction businesses and 75% to 85% of non-construction businesses will be required to familiarise themselves with the proposed regulations⁸.
41. Since the construction industry is already covered by the CHSWR, we have assumed small businesses will require 2 hours and large businesses 4 hours to familiarise themselves with the proposed regulations⁹. The cost to the construction industry of familiarising itself with the proposed regulations is estimated at £27.8 million and these costs are incurred during the first year of the appraisal period. This is a one off implementation cost and the only cost the construction sector will incur as a result of the proposed regulations.
42. In non-construction businesses it has been assumed that management will take an average of two days in large businesses, one day in medium businesses, half a day in small businesses, 2 hours for micro-sized businesses and for the self-employed¹⁰.

8 As a result of responses to the consultation process the number of businesses that will be required to familiarise themselves with the proposed regulations has increased from between 3% and 5% of all businesses to between 75% and 85% of all businesses.

9 The length of time required for familiarisation has been increased as a result of responses to the consultation from a quarter of an hour for small construction businesses and 2 hours for large construction businesses.

Small construction businesses employ up to 49 workers. Large construction businesses employ over 49 workers.

10 The length of time required for familiarisation for micro sized businesses and the self employed has been increased as a result of responses to the consultation from 1.5 hours for a micro sized business and 30 minutes for the self employed.

Larger non-construction businesses employ over 250 workers. Medium non-construction businesses employ between 50 and 249 workers. Small non-construction businesses employ between 10 and

The cost to non-construction businesses of familiarising themselves with the proposed regulations are estimated at between £102.7 and £116.4 million. This is a one off implementation cost.

43. The present value cost of familiarisation is between £130.5 and £144.2 million over the appraisal period.

Costs Of Modifications To Work Equipment

Ladders

44. The proposed regulations require ladders to be stable and not at risk from slipping. In practice this may increase the use of ropes, braces, and ladder stabilising devices (LSDs). There may also be a move to alternative methods of conducting work at height that is discussed in the costs of using alternative means of access section below.
45. The vast majority of LSDs are sold to the service industry, in particular window cleaners, painters and decorators, telecom engineers, security system installers, council maintenance workers and utility supply engineers. Manufacturers of LSDs believe that these workers are the most at risk from falls from ladders because many of the tasks they perform are 'one man tasks'.
46. If all 0.9 to 1.4 million workers working at height and using ladders were supplied with a LSD or brace (both at a cost of £60), the one off cost would be between £54.0 and £84.0 million. The actual costs incurred will be significantly less than this for three reasons: first, a proportion of ladders will already have adequate protection, second, more than one person may work with a single ladder, and third, other means of securing ladders may be readily available. In practice the degree of protection required will be related to risk.
47. The National Federation of Master Window Cleaners has estimated that a large proportion of window cleaners will purchase LSDs as a result of the proposed regulations. Bearing in mind the points above and that some window cleaners will operate ladder free system, it has been assumed that 70% of the 150,000 window cleaners will purchase a LSD. In addition to this, based on industry sources, it has been assumed that 50% of non-window cleaners working at height will purchase LSDs. The cost of purchasing LSDs has been estimated at between £28.8 and £43.8 million. This cost will be incurred in the first year of the appraisal period and is a policy cost. The equipment purchased will generally be durable so recurring costs have not been estimated.

49 workers. Micro sized non-construction businesses employ between 1 and 9 workers. The self employed employ no workers.

48. LSDs are likely to be the main policy cost for the majority of businesses.
49. An alternative method of ensuring ladder stability is for another person to 'foot' the ladder¹¹. Since LSD manufacturers have advised that the majority of workers are likely to work on 'one man tasks', footing has been assumed to be used only on an occasional basis. The lost productivity of the second worker could be significant so it is expected that the cost of footing will be no higher than using an LSD, otherwise a LSD would be used.

Training Costs

50. Workers are estimated to be earning an average of £12 per hour (including non-wage labour costs).

Ladders

51. The proposed regulations do not require specific training but competence appropriate to the task or role being undertaken. Workers who use ladders extensively will be required to be competent under the proposed regulations. Information from industry sources suggests that many workers have already received training adequate to meet the requirements of the proposed regulations. The self-employed and workers from smaller businesses are in general less likely to have received adequate training but they may interpret their experience as sufficient to meet the competency requirement.
52. It has been assumed that 5% to 10%¹² of those using ladders have not received adequate training but will as a result of the proposed regulations. The initial cost of training is between £4.4 and £13.7 million. This has been estimated under the following assumptions: (1) training takes 4 hours, and (2) the cost of the training course is £50.
53. If there are recurring training costs for 2% to 4% of the non-construction work force per year¹³ (to account for new personnel and refresher training), the total additional cost of training is between £17.8 and £55.5 million in present value terms over the appraisal period. This is a policy cost.

11 Evidence from HSE's Research Reports shows that this term is not clearly understood and there is little consistency of practices, in some cases the method of footing deployed may not achieve the desired outcome of securing a ladder.

12 The proportion of workers requiring training has been increased from 5% to between 5% and 10% as a result of the consultation.

13 The proportion of workers requiring recurring training has been increased from 0.05% of those using ladders to between 2% and 4% as a result of responses to the consultation.

Rope Access

54. IRATA sources indicate that most workers working in rope access have received sufficient training to comply with the proposed regulations. Some workers, such as window cleaners, who have taken IRATA training courses however opt for shorter courses that may be better suited to their training needs but may not meet the requirements of the proposed regulations. Industry sources have estimated the cost of conducting a one day competence assessment at £100. To estimate the total cost the following assumptions have also been made: (1) 10% of rope access worker have opted for the shorter courses and so will require a competence assessment under the proposed regulations¹⁴, (2) workers will be reassessed every 5 years so there is a recurring cost of 20% of the initial cost, and (3) the course lasts 8 hours. The present value cost of competence assessments has been estimated at £0.7 million over the appraisal period. This is a policy cost.

Costs Of Using Alternative Means Of Access To Heights

55. The proposed regulations require that ladders are only used where the use of other equipment (e.g. fixed platforms, mobile lifting equipment and scaffolds) is not justified because of (1) the level of risk, (2) the duration of work, or (3) existing site features that employers cannot alter.
56. It is difficult to estimate the extent of the changes needed to meet the requirement to consider alternatives to ladders because every case must be considered on its own merits. It has been assumed, based on industry and HSE sources, that 5% of workers currently using ladders will shift to alternative means of access as a result of the proposed regulations. The proposed regulations are likely to have both a one off and an ongoing effect on the current trend away from ladders and towards alternative means of access. This RIA only costs the additional effects that the proposed regulations are expected to have.

Mobile Elevated Working Platforms (MEWPs)

57. The International Powered Access Federation (IPAF) estimated that there are currently around 50,000 mobile elevated work platforms (MEWPs) in Great Britain. The cost of a MEWP is extremely variable with a typical MEWP costing between £10,000 and £20,000. It has been assumed that the average cost of purchasing a MEWP is £15,000 (the midpoint) and that MEWPs will be available for hire at £50 per day.

14 Source: IRATA.

58. It has also been assumed that 50% of workers shifting away from ladders will switch to using MEWPs. This means that between 22,500 and 35,000 additional workers will use MEWPs for work at height. Larger organisations and those carrying out a great deal of work at height the most likely to use MEWPs.
59. Industry sources indicate that the cost of dual training courses for Boom and Scissors equipment is between £150 and £180 per person and last a day. Businesses will often train more than one worker at a time and gain lower course rates so it has been assumed that training costs are £150 per worker. It has also been assumed that the recurring cost of training is 20% of the initial cost because the certificate received lasts for 5 years. The present value cost of MEWP training over the appraisal period is between £14.0 and £21.7 million. This is a policy cost.
60. It has been assumed, based on industry sources, that half of those switching to MEWPs will prefer to purchase rather than hire them. This is for two reasons: first, those choosing to use MEWPs instead of ladders are likely to carry out a great deal of work at height so it is likely to be more economical for them to purchase a MEWP rather than hire one, and second, the businesses deciding to replace ladders with MEWPs are likely to be larger and have the financial ability to purchase MEWPs. To estimate the cost to businesses of purchasing MEWPs it has been assumed that 4 employees use each MEWP and that MEWPs have a recurring cost of 10% of the initial cost. If these assumptions hold, between 2,800 and 4,400 new MEWPs are expected to be purchased as a result of the proposed regulations¹⁵. The present value cost to businesses of purchasing MEWPs is between £74.3 and £115.6 million over the appraisal period. This is a policy cost.
61. The remaining 50% of those switching to MEWPs will hire. Information from the hire industry indicates that businesses tend to rent for a matter of days as opposed to longer term leases. From the relative costs of purchasing and hiring, if a MEWP is hired for more than 30 days per year it is cheaper to purchase. To estimate hire costs it has been assumed that the average hire period will be half of this maximum (i.e. 15 days) and that there are 4 employees per MEWP. Hence, between 2,800 and 4,400 MEWPs will be hired for 15 days at an annual cost of £2.1 to £3.3 million. This has a present value cost of £18.2 to £28.2 million over the appraisal period. This is a policy cost.
62. The cost of shifting from ladders to MEWPs resulting from the proposed regulations has a present value of between £106.4 and £165.5 million over the appraisal period. This is a policy cost.

15 This represents an increase in the number of MEWPs of between 6% and 9%.

Tower Scaffolding

63. It has been assumed that the remaining 50% of workers shifting away from ladders will use tower scaffolds. This means that between 22,500 and 35,000 workers will shift to tower scaffolds.
64. Industry sources have indicated that the average cost of tower scaffold training course is £130 and lasts one day. Assuming that the average wage of a worker is £12 per hour (including non-wage labour costs) and that there are recurring costs of 20% of the initial cost (the certificate awarded on completion of the course lasts for 5 years) the present value cost of training is between £12.8 and £19.9 million over the appraisal period. This is a policy cost.
65. Industry sources indicate that the average cost of purchasing scaffold is £2,000 and the average cost of hiring scaffold is £50 per week. Businesses are more likely to hire than purchase tower scaffolds because the businesses choosing tower scaffolding rather than MEWPs are likely to be smaller and are less likely to be able to afford the one off cost of purchasing. Hence, it has been assumed that 20% of those switching to tower scaffolding will decide to purchase. It has also been assumed that 4 workers use each tower scaffold so between 1,100 and 1,800 tower scaffolds will be bought, and that recurring costs are 5% of the initial cost. The present value cost of purchasing tower scaffold is between £3.1 and £4.8 million over the appraisal period.
66. The cost of hiring tower scaffolds has been estimated under the assumption that tower scaffolds will be hired for 20 days per year on average¹⁶. The cost of hiring per year is between £0.9 and £1.4 million. This has a present value of between £7.7 and £12.1 million over the appraisal period.
67. The present value cost of shifting to tower scaffolding is between £23.7 and £36.8 million over the appraisal period.

Nets And Airbags

68. Nets and airbags are other alternatives for protecting workers from falls from a height. It is not possible to estimate increased use of these as a result of the proposed regulations. For illustrative purposes typical costs are provided.
69. Fall Arrest Safety Equipment Training (FASET) has stated that the cost per square meter for netting varies according to who the purchaser is (contractor or client) and how much is being purchased. They indicated that the main contractor rates for

¹⁶ Hirers will probably hire beyond the point where rationally it would be optimal to purchase because of capital constraints.

industrial sheds would range from £1 to £1.50 per square metre, and the main contractor rates for metal decking could range from £1.60 to £2.30 per square metre.

70. Industry sources also indicated that the highest price for installing an airbag would be £3.20 per square metre.

Set Up And Take Down Costs

71. There are likely to be additional costs from an increase in the length of time taken to 'set up' and 'take down' before and after tasks are performed at height. It has not been possible to estimate these costs because there is insufficient data available.

Costs To A Typical Business¹⁷

72. It is not possible to estimate the cost of the proposed regulations for a typical business because the businesses affected by the proposed regulations are heterogeneous. For illustrative purposes the cost to businesses of the proposed regulations at both extremes have been estimated. It is expected that the majority of firms will be closer to the lower extreme than the higher. In both examples costs have been estimated for a non-construction business employing between 10 and 19 workers.

Lower Cost Business

73. A business compliant with the duties of the proposed regulations will only incur familiarisation costs. It is assumed that familiarisation will take 4 hours. The present value cost of the proposed regulations for this business is £80 over the appraisal period.

Higher Cost Business

74. It has been assumed that a business facing high costs as a result of the proposed regulations may incur the following costs: general training for 15 workers, general training for 1 additional worker per year, purchasing 10 LSDs, purchasing 1 MEWP and recurring MEWP costs, training 4 workers to use a MEWP, training one additional worker per year to use a MEWP, and familiarisation costs. Under the additional assumptions detailed in the total costs section of this RIA the present value of these costs are £1500, £750, £600, £26,400, £1,000, £1900 and £80 respectively.

17 The cost to a typical business has been changed in response to comments received during the consultation process. The partial RIA presented the cost to the average business but because the cost to businesses are skewed, a large number of businesses will face small additional costs whilst a small number of businesses will face significant costs, the average is not representative of a typical business.

75. The present value cost of the proposed regulations for this business is £32,200 over the appraisal period.

Costs To HSE

76. HSE inspectors will be required to familiarise themselves with the proposed regulations. It has been estimated that familiarisation will take half a day for the 150 construction inspectors and a day for 450 other inspectors. Taking a weighted average of different inspectors wages across the different bands it has been estimated that the cost of an inspector's time is £23.97 per hour¹⁸ (including non-wage labour costs). The present value cost of HSE inspectors familiarising themselves with the proposed regulations is £0.1 million over the appraisal period. This is an implementation cost.
77. It is also expected that there will be increased burdens on field operations from answering queries. It has been estimated that when the proposed regulations are introduced inspectors will spend the equivalent of two days of their time answering queries. This has a present value cost for the 600 inspectors of £0.4 million over the appraisal period. In addition to this it has been estimated that 2,000 hours of policy team and Infoline time will be spent answering queries in the first year. The present value cost of this is £0.1 million over the appraisal period. Assuming that the volume of enquiries falls by 90% after the first year, the present value cost of answering enquiries is £0.5 million over the appraisal period.
78. The proposed regulations bring in several new duties that will be enforced by HSE and local authorities. The additional enforcement costs are not likely to be significant because the proposed regulations makes explicit in law what is currently good practice.
79. The present value cost to HSE of the proposed regulations is £0.6 million over the appraisal period. This is an implementation cost.

Costs to Local Authorities

80. Environmental Health and Technical Officers are responsible for making inspections for local authorities and will be required to familiarise themselves with the proposed regulations. There are 3,640 Environmental Health and Technical Officers, which is equivalent to 1,070 full time workers. It is assumed that officers will spend a third of a day familiarising themselves with the proposed regulations. This is equivalent to each of the full time equivalent officer spending a full day familiarising themselves.

¹⁸ The average wage of 1 band 2 member of staff, 3 band 3 members of staff and 6 band 4 members of staff.

81. The average salaries for Environmental Health Officers and for Environmental Health Technicians estimated by the Chartered Institute of Environmental Health are £24,700 and £20,200 respectively. Assuming 220 working days per annum and a 40-hour week, the average hourly wage is approximately £17 per hour (including non-wage labour costs). The present value cost of familiarisation is £0.2 million over the appraisal period.
82. There will also be an increased burden on Environmental Health and Technical Officers from answering queries. It is estimated that when the proposed regulations are introduced the 1,070 full time equivalent officers will spend approximately two days of their time answering queries (which is equivalent to the time spent by HSE inspectors). Assuming a recurring cost equal to 10% of the initial cost, the present value cost of answering enquiries for local authorities is £0.5 million over the appraisal period.
83. The total present value cost to local authorities of implementing the proposed regulations has been estimated at £0.7 million over the appraisal period.

Environmental Impact

84. No environmental impacts are expected from these proposals.

Table 4: Total costs To society¹⁹

Cost item	Present Value Of Costs Over the Appraisal Period	Annualised costs²⁰
Familiarisation	£130.5m - £144.2m	£15.2m – £16.7m
Training	£18.6m - £56.2m	£2.2m - £6.5m
Equipment modification	£28.8m - £43.8m	£3.3m - £5.1m
Alternative means of access:		
MEWPs		
Training	£14.0m - £21.7m	£1.6m - £2.5m
Purchasing	£74.3m - £115.6m	£8.6m - £13.4m
Hiring	£18.2m - £28.2m	£2.1m - £3.3m
Scaffolding		
Training	£12.8m - £19.9m	£1.5m - £2.3m
Purchasing	£3.1m - £4.8m	£0.4m - £0.6m
Hiring	£7.7m - £12.1m	£0.9m - £1.4m
Cost to HSE	£0.6m	£0.1m
Costs to LA	£0.7m	£0.1m
Total	£309.2m - £447.7m	£35.9m - £52.0m

Equity And Fairness

85. Those employed in the adventure activities sector, together with leisure walkers, climbers and cavers have claimed that the proposed regulations will have a disproportionate effect on them, and have knock on effects for local economies especially in Scotland, Wales, the Lake District and the Peak District. These concerns are largely unfounded. The proposed regulations only affect workers and support existing good practice from the national governing bodies. HSE believes that the proposed regulations will not have any significant effect on these sectors.

¹⁹ These figures may not add up due to rounding.

86. It is expected that the impact of the proposed regulations will be both reasonable and proportional for all key societal groups (i.e. disability, racial), areas (i.e. rural, urban), sectors, and company turnover.
87. There may be an increase in the number of injuries to members of the public if, for instance, the proposed regulations cause members of the public to shift from employing window cleaners to cleaning their windows themselves. The impact of this is unlikely to be large because: (1) it is likely that not all the extra costs imposed by the proposed regulation will be passed on to consumers, (2) any increase in prices may have a relatively small effect on the number of customers, and (3) some consumers may react to higher prices simply by reducing the frequency with which they purchase window cleaning services rather than by cleaning the windows themselves. It is therefore difficult to estimate the potential impact of the proposed regulations on the number of injuries to members of the public.

Impact On Small And Medium Sized Businesses

88. The Small Business Service (SBS) is a member of the tripartite sub-group involved in the development of these regulations. HSE has taken every opportunity to speak to trade organisations and other groups of employees about the regulations and also to listen to their ideas.
89. HSE has also employed consultants to engage small and medium sized enterprises (SME's) that may not belong to the trade associations, or read the trade press, and to gather their views so that these can be included in the consultation process. The companies participating in the research reported that they did not believe the proposed regulations would significantly change the way they currently approach or conduct work at height.
90. Window cleaning has been identified as a sector in which the regulations are likely to have a significant impact. A number of window-cleaning businesses were contacted by telephone. Industrial window cleaners are less reliant on ladders, due to their use of MEWPs, cradles or pole systems. But like their domestic window cleaning counterparts may need to purchase LSD's for the ladders they were using. The number of LSD's required would be dependent on the number of employees, ladders and LSDs they have.
91. There are no costs likely to arise from this directive that would represent an unreasonable, or disproportionate, burden on small and medium sized businesses. This is because the cost that a small firm is likely to incur is the price of purchasing

20 Annualised cost is the annual cost which when discounted over the appraisal period is equal to the present value of costs.

additional LSDs, which cost £60 each. The number purchased is likely to be directly related to the size of the firm. This was confirmed via consultation with a number of small businesses.

Competition Assessment

92. The proposed Work at Height Regulations will cover a broad range of companies in virtually all industry sectors. The telecommunications industry has been identified as a sector that the proposed regulations might have a significant impact on.
93. The market for telecommunications is characterised by a small number of large businesses with a large market share. In the telecommunications industry, large businesses account for 83% of turnover, compared with 55% across all industries. Due to the nature of the industry (network infrastructure), it is likely that a single business will have more than 20% of the market share, and that the three largest firms together will have at least 50% of the market share. The cost of the proposed regulations will not however affect some businesses more substantially than others, nor will they affect the market structure (change the number or size of businesses). The proposed regulations will also not lead to higher start up or higher on-going costs for new or potential businesses that existing businesses have to meet. This means that, despite the existing oligopolistic nature of the market, the proposed regulations will not adversely affect competition.
94. Each of the different industries affected have different structures but the effects of the proposed regulations on competition should be generic. The costs that the proposed regulations impose will be in proportion to the size of the businesses, and apply to all existing and potential businesses equally: the market structure and competition will not be adversely affected by the proposed regulations.

Comparison Of Costs And Benefits

95. The present value cost of the proposed regulations has been estimated at between £309.2 and £447.7 million over the appraisal period. To generate these cost estimates it has been assumed that there will be full compliance with proposals i.e. every worker who uses a ladder, scaffold or rope will be adequately trained and have the appropriate equipment. The size of the benefits for the proposed regulations are uncertain so it is not possible to make a judgement about whether costs will be larger or smaller than the benefits. If the proposed regulations lead to a reduction in the number of accidents by between 7% and 10%, benefits will balance costs.
96. The costs are significant but the largest cost element is familiarisation. This cost element is large because a relatively small cost is incurred by a large number of businesses i.e. over 3 million businesses.

Uncertainties

97. To a large extent the cost of the proposed regulations will depend on if businesses are already following good practice. For businesses following good practice the cost of the proposed regulations should be minimal. In some cases however, the proposed regulations may mean that current working practices are unsuitable. If this is the case, there could be significant costs.

Compliance With The Proposed Regulations²¹

98. In estimating costs it has been assumed that there will be full compliance with the proposed regulations. If compliance is less than 100% then both the costs and the benefits flowing from the proposed regulations will be reduced. It has been estimated that 25% of construction firms will familiarise themselves with these regulations²². The impact of less than 100% compliance in the non-construction sector has been estimated by multiplying all costs except HSE and local authority familiarisation costs by the level of compliance.

21 This section has been introduced to clarify what costs are expected to be imposed as a result of the proposed regulations.

22 This assumption has been made because around 50% to 66% of notifiable sites are notified under the Construction (Design and Management) Regulations 1994. Notifiable sites are at the larger end of the construction sector so it is likely that compliance rates for smaller businesses will be significantly lower.

Table 5: Effect of changes in the level of compliance in the non- construction sector²³

Non-Construction Level of Compliance	Present Value Cost £ million	Balancing percentage (reduction in the number of accidents)
25%	82 to 120	2% to 3%
50%	151 to 222	4% to 5%
75%	220 to 325	5% to 8%
100%	288 to 427	7% to 10%

99. The present value cost of the proposed regulations and the reduction in the cost of injuries necessary for benefits to balance costs are significantly reduced if compliance is less than 100%. It has been estimated that the level of compliance with the proposed regulations could be around 50% so the actual costs that will be imposed by the proposed regulations will be closer to £151 to £222 million than £288 to £427 million over the appraisal period (with 25% of construction businesses familiarising themselves with the regulations).

Number Of Workers Carrying Out Work At Height

100. The number of workers carrying out work at height is uncertain. After consultation with representatives of the relevant industries it has been estimated that the number of workers using ladders as an essential requirement of their job is between 0.9 and 1.4 million (excluding construction). If the number of workers using ladders is higher than this estimate, the cost of implementing the proposed regulations will be higher. Table 6 shows the effect that changing the number of workers using ladders has on costs and the percentage reduction in the cost of injuries necessary for benefits to balance costs.

²³ Assuming that only 25% of construction businesses will familiarise themselves with the new regulations.

Table 6: Number of Workers Using Ladders Outside Construction

Number of workers using ladders outside of construction	Present Value Cost £ million	Balancing percentage reduction in the cost of injuries
0.4m to 0.9m	216 to 344	5% to 8%
1.4m to 1.9m	403 to 551	9% to 13%
1.9m to 2.4m	497 to 655	12% to 15%

101. Modifying the estimate of the number of people carrying out work with ladders has a large effect on costs and thus the percentage reduction in the number of accidents required for benefits to balance costs.

Alternative Means Of Access

102. Another uncertainty is the proportion of ladder users switching to alternative means of access as a result of the proposed regulations. It has been assumed that 5% switch (equivalent to 45,000 to 70,000 workers) based on industry sources and the knowledge that there is already a trend towards alternative means of access. Table 7 shows the effect of changing the percentage switching to alternative means of access on costs and the percentage reduction in the cost of injuries necessary for benefits to balance costs.

Table 7: Proportion Of Ladders Users Switching To Alternative Means Of Access

Proportion of ladders users switching to alternative means of access	Present Value Costs £ million	Balancing percentage reduction in the cost of injuries
2.5%	247 to 352	6% to 8%
7.5%	371 to 544	9% to 13%
10%	433 to 640	10% to 15%

103. Modifying the proportion switching from ladders to alternative means of access has a large effect on costs and thus the balancing percentage. The benefits, as well as the costs, would increase with the number of people using alternative means of access because they are considered to be safer than using ladders²⁴.

²⁴ During the consultation process it has been argued that scaffolding is less safe than ladders. The argument is based on HSE's statistics of 2001/2. There were 11 fatalities for 0.63 million scaffolding users, giving an incident rate of 1.7 fatalities per 100,000 users. This is greater than the incident rate

Proportion Selecting MEWPs And Tower Scaffolding

104. Another uncertainty is the proportion of businesses choosing to use MEWPs or tower scaffolds. It has been assumed above that there is a 50/50 split. Table 8 shows the effect that different splits have on costs and the balancing percentage.

Table 8: Proportions Selecting MEWPs And Tower Scaffolding

% Choosing MEWPs / % choosing tower scaffolding	Present Value Costs £ million	Balancing percentage reduction in the cost of injuries
100% / 0%	386 to 567	9% to 13%
75% / 25%	347 to 507	8% to 12%
25% / 75%	271 to 388	6% to 9%
0% / 100%	233 to 329	5% to 8%

105. The costs and thus balancing percentages are lower the greater the proportion deciding to use tower scaffolding. This is because MEWPs are more expensive than tower scaffolds.
106. Despite the higher cost of MEWPs, the benefits of MEWPs and tower scaffolds are approximately the same.

Other Uncertainties

107. Another uncertainty is whether those switching from ladders will decide to purchase or hire their equipment, and the duration of the hire term. For those switching to MEWPs, it was assumed that half would buy and half would hire for an average of 15 days per year. This was based on industry information and our knowledge of the costs of the two options. For those switching to tower scaffolding, it was assumed that only 20% would purchase and the remainder would hire for an average of 20 days per year. Again, these assumptions were based on industry information and the costs of the two options, combined with knowledge that those most likely to switch to scaffolding are more likely to face constraints on their ability to borrow for capital investments.

of 0.7 for the 2 million ladder users, which had 13 fatalities. However, scaffold work is generally performed at a greater height, and therefore these figures are not comparable. Those who work on scaffolding tend to do so for most of their time at work, whilst ladders are used for a lower percentage, and therefore the statistics are again not directly comparable. We believe that scaffolding is generally safer than ladders.

108. There are other uncertainties that are expected to have less significant impacts on costs. Two of these are the proportion of ladder users purchasing LSDs and the proportion of ladder users requiring ladder safety training. It has been assumed that 70% of window cleaners and 50% of other ladder users will purchase LSDs and that 5% to 10% of ladder users will receive ladder safety training.

Consultation

109. There were a number of responses to the RIA during the consultation process. As a result of these responses the following changes have been made to the Partial RIA:
- The cost for an average business presented in the 'costs to a typical business' section has been replaced by the cost to businesses that have low and high costs imposed upon them as a result of the proposed regulations.
 - The proportion of the workforce requiring general training has been increased from 5% to between 5% and 10%. This is a result of comments indicating that the cost of general training had been underestimated.
 - The proportion of the workforce requiring recurring general training has been increased from 0.05% to between 2% and 4%. This is a result of comments indicating that the recurring cost of general training had been underestimated.
 - The length of time required for familiarisation has been increased from 15 minutes to 2 hours for small construction businesses and from 2 hours to 4 hours for large construction businesses. This is a result of comments indicating that these costs had been underestimated.
 - The length of time required for familiarisation has been increased from 1.5 hours to 2 hours for micro sized non-construction businesses and from 30 minutes to 2 hours for the non-construction self employed. This is a result of comments indicating that these costs had been underestimated.
 - The proportion of non-construction businesses required to familiarise themselves with the proposed regulations has been increased from between 3% and 5%, to between 75% and 85%. This is a result of comments indicating that these costs had been underestimated.
 - Potential costs from increased 'set up' and 'take down' time have been noted but not quantified because insufficient information available.
 - The number of accidents reported in IRATA's 1999 Annual Survey have been corrected.
110. The following additional changes have been made to the partial RIA:

- The costs of major and over-three-day injuries have been estimated separately from the cost of fatal injuries because available estimates for the cost of major and over three day injuries have improved.
- The expected level of compliance and the associated costs have been estimated in the uncertainties section.

Arrangements For Monitoring And Evaluation

111. These proposals will be subject to formal review by the EC after 4 years. The implementing regulations will be monitored by HSE and existing industry/ HSE liaison bodies.
112. The impact of the proposed regulations will be assessed over time by monitoring injury reports made under RIDDOR.

Enforcement And Sanctions

113. Depending on the industry sector concerned, the regulations will be enforced by either the HSE or local authorities.
114. Non-compliance will be identified by responding to queries raised, investigating accidents and incidents, and routine checks by inspectors. Where appropriate enforcement action may be taken in accordance with the HSC Enforcement Policy Statement.
115. The Health and Safety at Work Act 1974, section 33 (as amended) sets out the offences and maximum penalties under health and safety legislation.

Summary And Recommendation

116. Three options were originally considered. However, the options differed in how the regulations were presented, and not in their content. Therefore the only differences in cost between the three options were from familiarisation and impact. The legal basis, enforcement, clarity and effectiveness were therefore the significant criteria for choosing to implement the Temporary Work at Height Directive with a set of stand-alone regulations.
117. Whilst it can be argued that familiarisation costs for the chosen option could be lower than for the other two options, as there would only be one set of regulations for employers to understand, the greater impact of the new stand alone regulations is likely to result in a greater number of employers being aware of the regulations. In addition as new stand-alone regulations are likely to result greater awareness, both costs and benefits are expected to be higher for the chosen option.

Ministerial Declaration

I have read the Regulatory Impact Assessment and I am satisfied that the benefits justify the costs.

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