

**PROPOSED AMENDMENTS TO THE HEALTH AND SAFETY AT WORK ETC  
ACT 1974 (APPLICATION OUTSIDE GREAT BRITAIN) ORDER 1995**

**REGULATORY IMPACT ASSESSMENT (Draft)**

**PURPOSE AND INTENDED EFFECT**

**Issue**

1. The HSWA applies to all work activities in Great Britain including land based wind farms. Within territorial waters the Act applies only to certain defined activities. This includes the construction, repair and maintenance of offshore wind farms but not their operation. The HSWA applies outside Great Britain by virtue of the Health and Safety at Work etc. Act 1974 (Application Outside Great Britain) Order 1995 (The Order). Developments in technology make it likely that offshore wind farms and other energy structures will be in use in the next few years and we would want to ensure they are covered by health and safety legislation. We therefore propose to amend the Order to include the operation of offshore wind farms within UK territorial seas and ensure that all parts of the offshore installation are covered by legislation.

**Objectives**

2. The proposed amendments to the Order will:
- bring energy structures in territorial seas within the scope of HSWA and ensure a consistent approach to onshore and offshore wind farms,
  - ensure that all parts of offshore installations are within the scope of appropriate health and safety legislation.

**Risk assessment**

3. There are potential risks associated with the operation of offshore energy structures including offshore wind farms, to sea users or to visitors whose purpose is not construction, reconstruction, alteration, repair, maintenance, cleaning, demolition and dismantling of the structure. There is no accident record for the types of structures affected by this legislation but data on non-catastrophic (ie excluding major fires and explosions) risk in the offshore sector

provides some indication of potential hazards. Between April 1998 and March 1999 there were approximately 5 injuries involving sea and air transportation, 111 injuries involving slips, trips and falls, 20 injuries involving use of machinery and a further 2 injuries were diving related. This is in part due to the hostile external environment and the relatively large amount of heavy machinery involved in the energy production process. There are particular risks arising from offshore activities relating to personnel travelling from the shore, working at night, moving objects (including machinery), any diving operations that may be required, and risk of fire combined with limited means of escape.

## **OPTIONS**

- i. Amend the Order as proposed.
- ii. Retain the present position. This will mean that HSWA does not apply to offshore wind farms, and that supplementary units / energy structures linked to offshore installations are not within the scope of offshore health and safety legislation.

## **INFORMATION SOURCES AND BACKGROUND ASSUMPTIONS**

4. Information on the costs and potential benefits of these regulations has been compiled following an initial survey of industry via a postal questionnaire. HSE received responses from three firms planning to build and operate energy structures in territorial seas and this forms the basis of the estimates below. This information was supplemented via informal industry contacts to ensure all types of energy structure or supplementary unit were represented and to obtain more detailed information on certain areas. It should be noted that this was a preliminary consultation process and, that the views presented by industry are subject to a more detailed examination during formal consultation. Costs and benefits of this regulation are calculated over the appraisal period 2001/2 - 2010/11.

## **BENEFITS**

### **Health and safety benefits**

5. As we are dealing with recent developments there is no historical evidence to assess risk to personnel ie there is no accident record. The major risks are to sea users and to those visiting the structure for operational purposes. However, due to the relatively low number of personnel required to visit the structures for operational purposes (a maximum of 25 people

over the appraisal period) and the infrequency of these visits, very few actual injuries are predicted.

### Other benefits

6. In terms of HSE's activity there are benefits for the inspection function from the perspective that it will clarify the application of legislation to energy structures and supplementary units. A conclusion derived from the postal survey results is that this developing industry is actively seeking clear guidelines on health and safety practice. Further benefits can be gained by industry from implementing health and safety measures in terms of avoiding production costs associated with accidents.

7. Finally, the government has set a target of producing 10% of the country's electricity needs from renewable sources by 2010. Maintaining a safe working environment within which this form of energy production can be undertaken will ensure that the government can continue to move towards this objective. Achieving this target is also consistent with reducing carbon dioxide emissions in accordance with international Global Warming initiatives.

### COSTS

#### Business sectors affected

8. These proposals are likely to have an impact on two types of structure: energy structures in territorial seas and supplementary units providing 'information or substances' to existing offshore installations. Regarding the latter type of structures HSE has received information about units designed to fulfil functions such as power generation, subsea control system facilities and chemical injection facilities. However, these units are still at the planning and development stage and none are expected to be operational during the appraisal period thus the remainder of this RIA will deal exclusively with energy structures in territorial seas.

9. The offshore generation of energy from renewable resources is a developing sector featuring very few operating companies who generally have had some previous experience with regard to renewable energy production. Although no energy structures are currently operational a small wind farm comprising two towers is due to come into operation this year and an additional wave powered structure by the middle of next year. Each development will

be operated by a different company and will initially be for demonstration purposes only. However, the structures are designed to be grouped together in large numbers and it is expected that farms of up to 100 of each type of structure will be built and operated on one site. In addition, another firm is planning to build and operate a wind farm commencing in 2003, again comprising approximately 100 structures.

### **Compliance costs to business , charities and voluntary organisations**

10. The main costs to a business operator in order to comply with this legislation can be divided into start-up and recurring costs. The main start-up costs are for personal protective safety equipment (mainly to ensure safety during transit eg lifejackets); time spent by managers in familiarising themselves with the requirements, organising the initial risk assessment and in review meetings before and after the assessment, and training for engineers and technicians (again mainly relating to safe transit from the shore to the structure) visiting the relevant structures for operational purposes. Subsequent annual recurring costs are expected to arise from reviewing and revising the risk assessment, maintaining the safety equipment and refresher training courses.

### **Compliance costs for a 'typical' business**

11. The following costs relate to the operation of a two-tower wind farm planned for later this year which will be the first set of energy structures within scope of the new requirements (see table 1 for summarised costs). The wave powered energy structures, the first of which is planned for next year, are designed to require relatively few operational visits which will be external only and compared to wind farms will be self-contained and mobile. In general it is expected that a windfarm of around 100 structures would require around 10 personnel to operate it full-time with approximately half that required for a farm of wave powered energy structures of the same size. Thus costs associated with wave powered energy structures are assumed to be approximately half those for the related wind powered structures.

12. The start-up costs to a typical business are expected to be approximately £10,300 in the 2001/2 appraisal year. This figure comprises approximate costs of £1,500 for safety equipment relevant to two personnel making operational visits, training costs of £5300 for these staff, and approximately £3400 for the risk assessment. The risk assessment and familiarisation process will involve approximately 22 person-days of management time. To

obtain the cost implication this figure has been multiplied respectively by: the estimated number of hours worked in the day, the hourly wage for 'Production managers in Manufacturing, Construction, Mining and Energy industries' (New Earnings Survey 1998), and, uprated for real economic wage cost and nominal earnings growth (see calculation below). Similarly, training costs, which were estimated in current prices have been uprated according to nominal earnings growth over the next year and real economic wage cost.

$$22 \text{ days} * 7 \text{ hours} * \text{£}15/\text{hour} * 1.27 * 1.16 = \text{£}3400$$

13. Recurring costs are slightly more difficult to estimate due to the delay expected until the planned development begins full operation and certain assumptions have been made as to the future profile of this wind farm. In 2002/3 the first set of recurring costs are expected to equate to around £1300 in 2001/2 prices. The cost of the risk assessment is estimated to involve around 3 days of management time which equals approximately £445 (using the calculation shown above and discounted to 2001/2 prices).

14. Information received from the postal survey showed that firms found it difficult to separate between the cost of refresher training courses and maintenance of safety equipment. Therefore, it was estimated that the combined cost would be £2000 incurred every 3 years, increasing by a factor of 2 for every 50 towers built. Thus, the annual recurring cost of both items in the appraisal year 2002/3 was equal to £2000 divided by three. This annual cost was separated into training and equipment costs by applying the relevant proportion to this figure. The proportion was calculated by dividing initial training (or equipment) cost by the sum of initial training cost and equipment costs. The figure for training cost was then uprated using nominal earnings growth and real economic wage cost and discounted to give a cost of £730. The safety equipment cost which was discounted but not uprated was approximately £140.

15. Commencing in 2003/4 it is expected that this business will incur additional recurring costs as further towers are built. It has been assumed that 50 towers will be built in this year with a further 50 to follow in the following year. According to industry contacts an additional 4 days of management time would be required to carry out the risk assessment for every 50 towers built. Further, the annual recurring cost of training and safety equipment are both expected to double for every 50 towers built. Thus recurring costs would be expected to increase significantly in subsequent years during the appraisal period. The final net present

cost over the appraisal period is expected to be around £43,000 of which over half comprised of training costs and a further third would be allocated to risk assessment and familiarisation costs.

Table 1: Compliance costs to a typical business

Provision	Start-up Cost (2001)	Recurring Annual cost (2002 - 2010)	Present value over 10 years
Cost of risk assessment	£3,400	£445*	£14,200
Training cost	£5,300	£730*	£24,250
Safety equipment	£1,500	£140*	£4,900
Total			£43,340

\*These figures quote costs relating to the 2002/3 appraisal year. These annual costs are expected to increase until the 2004/5 appraisal year as more structures are built by the operator. This increase is expected to be approximately in the range of 2 to 3 times the figure quoted.

### Total compliance costs

16. As mentioned in the ‘business sectors affected’ section wind and wave powered energy structures in territorial seas are designed to be grouped together in farms of up to 100 and normally it is expected that all structures would be in place within 1-2 years of operation commencing. However, in this case the three operators that HSE expects to be operating during the appraisal period will only commence large-scale operations from around 2003. Thus the recurring costs take account of the staggered nature of the developments using the assumptions described in the business sectors section.

17. Total compliance costs to industry are estimated at table 2. As can be seen the most significant areas of additional cost are in risk assessment and training which combined represent approximately 80% of total start-up costs and over 90% of total net present value costs. The total additional cost to the industry of these proposals is estimated at approximately £108,000 in present value terms (base year 2001) over ten years.

Table 2 : Total compliance costs to industry

Provision	Start-up Costs	Recurring Annual cost (2002 - 2010)	Present value over 10 years
Cost of risk assessment	£8,230	£670*	£33,200
Training cost	£17,840	£1,100*	£62,270
Safety equipment	£4,970	£210*	£12,730

Total		£108,230
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\*These figures quote costs relating to the 2002/3 appraisal year. These annual costs are expected to increase until 2005/6 as each firm develops more structures. This increase is expected to be up to a maximum of 5 times the figure quoted.

### **Costs to HSE**

18. The major cost to HSE over the appraisal period will relate to inspection of the energy structures in territorial seas. This cost will comprise updating inspectors on the requirements, training in basic survival methods and additional time taken to visit these structures. Assuming a typical plan of inspection for these energy structures, over a 10-year period (base year 2001) there will be a cost of approximately £10,000 to HSE. There will also be a relatively small cost in developing the proposed regulations by the relevant policy unit.

### **Total costs to society**

19. Total cost to society will consist of two main components: the cost to industry (summarised in the 'total compliance costs' section) which we expect to be £108,230 and the cost to HSE inspectors which we expect to be approximately £10,000. Thus the total cost to society is expected to approach £120,000 over the appraisal period 2001/2 to 2002/3.

### **IMPACT ON SMALL BUSINESSES, CHARITIES AND VOLUNTARY ORGANISATIONS**

20. No small firms are expected to operate in this sector.

### **ENVIRONMENTAL IMPACTS**

21. The main impact will be to ensure a safe working environment within which renewable forms of energy production can take place offshore. As described in the 'other benefits' section it is expected that this will assist in meeting national and international targets on the reduction of carbon dioxide emissions.

### **BALANCE OF COSTS AND BENEFITS**

22. Total quantified costs over ten years, in present value terms, are estimated at approximately £120,000. We have not been able to quantify any benefits of the proposals, however, there are benefits accruing to industry from clarifying which legislation applies and providing guidelines on health and safety. The same benefit also applies to HSE's inspectors. This legislation is justified on the basis that industry understands the need for such

requirements due to the production and rescue costs associated with accidents and is actively looking for guidelines on health and safety practice. In addition, the non-catastrophic risk of accidents (eg slips, trips and falls) in the offshore sector as a whole is known to be higher than for onshore activities and thus, safety benefits could be significant in the long run.

### **Uncertainties**

23. The main uncertainty regarding the calculations included in this RIA relates to the future profile of the industry. Based on the information available certain assumptions have been made as to how the size of the wind farms will develop and in which time periods. According to the extent to which the actual pattern of development differs from that assumed, will determine how much actual costs will differ from those predicted.

### **ARRANGEMENTS FOR MONITORING AND EVALUATION**

24. We will confirm with HSE inspectors that this will be carried out as part of their normal inspection practice. FOD inspectors will have enforcement responsibility for energy structures in territorial seas and OSD inspectors for the energy units which are part of the offshore installation. We will make arrangements to evaluate the changes in two years.

### **Contact point and date**

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