

**Environmental Assessment of Nuclear Decommissioning Projects****REGULATORY IMPACT ASSESSMENT (Full)***(Revision 3 – 9<sup>th</sup> December 2005)***PURPOSE AND INTENDED EFFECT****Objectives**

1. The purpose of these amendment regulations is to meet the legal requirements to correct typographical errors in the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (EIADR99), implement the (relevant) amendments made to the EIADR99's parent directive, and simplify arrangements around decommissioning part(s) of a nuclear licensed site.

**Background**

2. The Joint Committee on Statutory Instruments (JCSI) identified two typographical errors that need correcting. There is a legal requirement for the Health and Safety Executive (HSE) to correct these errors.
3. The amendment to simplify arrangements around decommissioning part(s) of a nuclear licensed site has been identified by HSE following an internal review of the EIADR99. This amendment will avoid (subject to HSE'S agreement) the need for stopping the *whole* of a decommissioning project if change/extension occurs on only part(s) of a site that results in a severe, adverse effect on the environment (SAEE).
4. The changes required by implementing the (relevant) amendments made to the EIADR99's parent directive; the Environmental Impact Assessment (EIA) Directive 85/337/EC, as amended by 97/11EC, are mainly for clarifying requirements that the EIADR99 already comply with in practice even though it may not be explicit in the regulations. However, one amendment will remove the blanket exemption from the EIADR99 of defence related projects. This amendment will now require a case-by-case assessment by the Ministry of Defence (MoD) on whether an application for a specific exemption to the EIADR99 is necessary.

**Rationale for government intervention**

5. The changes required to amend the typographical errors are driven by the need to meet the requirements of the JCSI. The amendment to simplify arrangements around decommissioning part(s) of a nuclear licensed site was identified by HSE following an

internal review of the EIADR99. The Nuclear Decommissioning Authority has also recently identified this scenario as warranting consideration. The final set of amendments is driven by the requirements to implement a revised EU directive (failure to implement the amendments required by the change to the EIADR99's parent directive will result in infraction proceedings).

6. If HSE decided to 'do nothing' instead of implementing the efficiency amendment described in paragraph 3, then the whole of a decommissioning project will have to stop if a change/extension occurs on only part(s) of a site where this change will result in a SAEE. HSE believes such action is disproportionate to the actual risks to the environment. Such an action would also result in project hold-up to the licensee that could be avoided if this amendment is made.

## **CONSULTATION**

### **Consultation Within Government**

7. The Office of the Deputy Prime Minister, Ministry of Defence, Department for the Environment, Food and Rural Affairs, The Scottish Executive, Scottish Environmental Protection Agency, Environmental Agency, Food Standard Agency, Department of Trade and Industry, and National Assembly for Wales were consulted on and in agreement with the proposals.

### **Public Consultation**

8. The proposals were put out to public consultation during the period 01 August – 31 October 2005. 13 responses were received with 8 in favour of the proposal, 3 offering further suggested changes, one making no comment and just one response against the proposal. A list of the respondees to the consultation exercise, the comments made and HSE 's response are detailed in Appendix A.
9. The consultation response from the Ministry of Defence (MoD) suggested that a revision should be made to the cost assumed in the Partial RIA for running an MoD decommissioning site. This was therefore amended from £300,000 to £2,600,000 per year. This change has increased the estimate of total costs presented in this RIA, but has not significantly altered the balance of costs to benefits.

**OPTIONS**

10. The following options are being considered:

**Option 1:** Continue to apply the existing regulations as set out in the *Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999* Statutory Instrument.

**Option 2:** Update the existing regulations to take account of changes made to the relevant EU Directive (97/11/EC) and the findings of the JCSI.

**Option 3:** Implement a new set of regulations which ease the burdens on site operators whilst maintaining the existing level of environmental assessment. Also implement the changes of option 2.

**Option 1**

11. In 1999 a set of regulations was introduced to address an amendment to the EU Directive *Environmental Impact Assessment Directive 85/337/EEC*, brought about by EC Directive 97/11/EC. These regulations set out the principle that an Environmental Statement must be completed and presented to the competent authority (the Health and Safety Executive) before a decommissioning project can be allowed to proceed. This Environmental Statement would include an Environmental Impact Assessment. The regulations do not apply to any project “serving national defence purposes”.
12. Option 1 is to continue working under these regulations.
13. This option will not address the objectives set out in paragraph 1.

**Option 2**

14. There are two areas where HSE is legally obliged to take action.
- The EU Directive outlined under option 1 has been further amended by Directive 2003/35/EC. The exemption for projects “serving national defence” has been removed and the Ministry of Defence will need to assess each decommissioning project on its merits and either apply for a specific exemption from the relevant Secretary of State or carry out an Environmental Impact Assessment.
  - The Joint Committee on Statutory Instruments has identified some typographical errors which the Health and Safety Executive is obliged to clarify.
15. Option 2 would implement sufficient changes in British legislation to meet the requirements of the relevant EU Directive and those set out by the JCSI.
16. This option addresses the objective to meet the relevant legal requirements set out in the objectives of paragraph 1. It does not, however, meet the objective of generating some efficiency gains.

**Option 3**

17. Under the existing regulations, before a decommissioning project may proceed, a licensee of a nuclear site must submit (and have approved) an Environmental Statement. If the project is subsequently subject to an unforeseen change or alteration which may result in an SAE, then the licensee must submit, and have approved, a new Environmental Statement. Until approval has been granted, all work on the project must stop. This option would amend the regulation such that only that section, or sections, of the site which are likely to be affected by the change or extension will be required to halt work.
18. Option 3 would implement these changes in addition to the changes outlined in Option 2.
19. Option 3 addresses all the issues raised in the objectives of paragraph 1.

**COSTS AND BENEFITS**

20. HSE has consulted both internally and externally regarding the costs to industry (and the Ministry of Defence) of carrying out (and of delaying) decommissioning projects. The decommissioning process for nuclear reactors may last for up to a century. The appraisal period for this RIA has therefore been set to 100 years. The standard Treasury discount rates for long-term projects are 3.5% for up to 30 years, 3.0% for between 31 and 75 years and 2.5% between 76 and 100 years. For this document a discount rate of 3% has been used. All prices are given in 2005 values throughout.
21. A number of assumptions has been made in the following analysis and are detailed in the text. Important examples are the assumptions made regarding the timescale of the Ministry of Defence decommissioning programme (some details of which are classified) and the likely frequency of "changes or extensions" to civilian (and military) decommissioning projects.
22. Due to the high profile, and low number, of nuclear decommissioning projects it is assumed that compliance with the existing regulations approaches 100%. It is also assumed that the level of compliance will not fall with the introduction of any of the options discussed.

**Sectors and groups affected**

23. The proposed changes will affect public sector organisations (both civilian and military) working on nuclear decommissioning projects. For each licensed site in Great Britain the number of staff employed (whether by the licensee or by firms undertaking some form of sub-contracted work) can vary greatly. For example, on a

Magnox Electric site, the number of employees directly employed by the licensee can range from 350 to 450. There is also likely to be some sub-contracting of work to private firms, which varies by project and over time. This is considered further in the section below, "Small Firms Impact Test".

24. The main costs presented in this document fall upon the Ministry of Defence, while the largest benefits accrue to the civilian decommissioning sector. It should be noted that the benefits, flowing from the changes which result in the extra costs to the MoD, have not been quantified.

## **BENEFITS**

### **Social benefits**

#### ***Option 1***

25. There are no anticipated social benefits for option 1.

#### ***Option 2***

26. There are no anticipated social benefits for option 2.

#### ***Option 3***

27. If a "change or extension" causing an SAEE takes place, option 3 will allow a site operator to continue working on the unaffected portion of the site, while under the existing regime they would have to stop work on the entire site. The total time taken to complete the project would therefore be reduced and it is assumed that this will have some societal benefit in terms of a quicker removal of the hazards from the site. This benefit has not been quantified however.

### **Environmental benefits**

#### ***Option 1***

28. There will be no additional benefits under option 1.

#### ***Option 2***

29. Under this option, the Ministry of Defence either will be required to produce an Environmental Statement, or to construct some justification for an exemption for a

given decommissioning project. This process may lead to some environmental concerns being addressed which would not otherwise have been considered. These benefits have not been quantified however.

### **Option 3**

30. The potential environmental benefit identified for option 2 will also apply to option 3.

### **Economic Benefits**

#### **Option 1**

31. There are no anticipated economic benefits associated with option 1.

#### **Option 2**

32. There are no anticipated economic benefits associated with option 2.

#### **Option 3**

33. Although there are no direct economic benefits associated with this option, there are significant cost savings. As these cost savings are the focus of option 3, they are included here.
34. Under the existing regime, if a change or extension to the project requires a new Environmental Assessment to be produced, the operator of a site must stop work. However, the running costs of the site are not significantly reduced so there is little immediate cost saving, while the total length of time for completion of the project is put back. Typically, the process of filing, and having approved, an Environmental Statement takes one year. The average timescale of a civilian nuclear decommissioning project is 100 years so the cost of the year extension must be discounted to take this into account. The average running costs for a civilian nuclear decommissioning project are in the order of £50,000,000 per year, in 2005 prices.
35. Under option 3, only a portion of the site will be required to stop work. The total length of time taken to complete the project will therefore be extended by less than a year. The specific length of time will depend on the details of each decommissioning plan so the following possibilities are considered:
- (i) project length extended by 8 months (for a 12 month initial delay)
  - (ii) project length extended by 4 months (for a 12 month initial delay)

36. Decommissioning projects are split into phases and changes to the existing plans may occur at any stage.<sup>1</sup> The number of such changes, by their nature, is hard to predict. For illustrative purposes, the following schedule of changes (including three possible scenarios) is assumed:

	Phase 1	Phase 2	Phase 3	Total
<b>Scenario A</b>	3	3	6	12
<b>Scenario B</b>	4	6	8	18
<b>Scenario C</b>	5	9	10	24

**Table 1: Predicted number of "changes or extensions"**

37. The present value and annualised cost savings generated by these scenarios are given in the following table.<sup>2</sup>

		Present Cost Saving	Annualised Cost Saving
Scenario A	Possibility (i)	£7,900,000	£242,000
	Possibility (ii)	£16,700,000	£514,000
Scenario B	Possibility (i)	£10,200,000	£313,000
	Possibility (ii)	£22,300,000	£686,000
Scenario C	Possibility (i)	£11,700,000	£360,000
	Possibility (ii)	£26,600,000	£816,000

**Table 2: Project Extension Cost Savings**

38. The total economic benefits for this option are made up of the cost savings from shortened total project time. The savings range from £7,900,000 to £26,600,000 in present value terms, depending on the assumptions made. These can be expressed as annualised figures of £242,000 and £816,000 respectively.

<sup>1</sup> Civilian decommissioning projects are typically split into three phases. The first phase is made up of post-defuelling clean-up and work to make the site safe for the second phase. The second phase is the "care and maintenance" phase, during which the site is left to allow for natural radioactive decay. The final phase is "site clearance" where the site is returned to a state fit for future use.

<sup>2</sup> Annual figures in this document have been calculated by dividing the present value of the cost by an annualisation factor. This transformation gives a figure which represents a yearly flow of funds which, when discounted over the appraisal period of 100 years, equals the present value. For this document the annualisation factor is 32.55.

**Total benefits**

39. There are no additional benefits for option 1.
40. There is a possible environmental benefit under option 2 if the Environmental Impact Assessments carried out by the Ministry of Defence lead to some new environmental issues being addressed.
41. Option 3 has a potential (non quantified) benefit, if reducing the total time taken to complete a decommissioning project has positive health and safety or environmental outcomes. Option 3 also presents economic benefits in the range £7,900,000 to £26,600,000 in present value terms or £242,000 to £816,000 in annualised terms.

**COSTS****Social Costs**

42. There are no social costs anticipated for any of the options.

**Environmental Costs**

43. There are no environmental costs expected under any of the options.

**Economic Costs*****Option 1***

44. There are no extra economic costs under option 1.

***Option 2***

45. Option 2 removes the exemption applied to nuclear decommissioning projects “serving national defence purposes” and, as such, the Ministry of Defence will be required to produce Environmental Statements for these projects
46. The decommissioning of the submarines will take place at designated ISOLUS (Interim Storage of Laid Up Submarines) sites. There may be up to 4 such sites, each of which will need to carry out Environmental Impact Assessments and produce Environmental Statements. The cost for each of these statements is estimated at £300,000 in 2005 prices.
47. The Environmental Statements will be assessed, and consulted on, by HSE. Assuming each assessment takes 2 days work for a Band 1 official, 53 days for a

band 3, 64 days for a band 5 and 20 days for a band 6, it is expected to cost HSE £19,000 per statement, in 2005 prices.

48. There are assumed to be four environmental assessments at the beginning of the decommissioning work and that over the following years there are between 5 and 10 changes or extensions which are evenly spread over time. The costs of producing and assessing the environmental statements will be as follows.

	<b>Cost to MoD</b>	<b>Cost to HSE</b>	<b>Total Cost</b>
5 changes	£2,300,000 (£72,000)	£151,000 (£5,000)	£2,500,000 (£77,000)
10 changes	£3,600,000 (£109,000)	£228,000 (£7,000)	£3,700,000 (£113,000)

**Table 3: Cost of Environmental Statements to MoD and HSE  
Present Costs (Annualised figures in brackets)**

49. Producing, and receiving approval following, an Environmental Statement typically takes one year. During this time, no work can be carried out at the site and the completion of the project is put back by a year. The cost of one years work on a site in current prices is £2,600,000. As the effect of the stop in work is to put back the completion date of the project, this figure must be discounted, as presented in table 4.

	<b>Total Net Cost</b>	<b>Annualised Cost</b>
5 changes	£5,000,000	£153,000
10 changes	£9,200,000	£284,000

**Table 4: Costs to MoD from Project Extension (Option 2)**

50. The total economic costs for this option are between £7,500,000 (5 additional changes) and £12,900,000 (10 additional changes) in present value terms or between £229,000 and £397,000 as annualised figures.

**Option 3**

51. Under option 3, the MoD may be required to stop work on only a portion of an ISOLUS site, when producing an Environmental Statement. This would mean that the total length of the project would be extended by less than the year which it typically takes to have an Environmental Statement produced and approved. As such, the costs faced by the MoD will be lower than under option 2. As the exact extent to which the completion date for a project might be put back is uncertain, table 5 considers two scenarios:

- (i) project length extended by 8 months (for a 12 month initial delay)
- (ii) project length extended by 4 months (for a 12 month initial delay)

		<b>Total Net Cost</b>	<b>Annualised Cost</b>
5 changes	Possibility (i)	£3,100,000	£94,000
	Possibility (ii)	£2,100,000	£64,000
10 changes	Possibility (i)	£6,800,000	£207,000
	Possibility (ii)	£3,100,000	£94,000

**Table 5: Costs to MoD from Project Extension (Option 3)**

52. The total economic costs for this option are made up of the project extension costs given in table 5 and the direct costs of producing Environmental Statements, given in table 3 (as for option 2). These costs add up to between £4,600,000 (5 additional changes, scenario ii) and £10,400,000 (10 additional changes, scenario i) in present value terms or between £140,000 and £321,000 as annualised figures.

**Total costs to society**

- 53. There are no costs for option 1.
- 54. The total costs to society for option 2 are between £7,500,000 and £12,900,000 in present value terms or between £229,000 and £397,000 as annualised figures.
- 55. The total costs for option 3 are between £4,600,000 and £10,400,000 in present value terms or between £140,000 and £321,000 as annualised figures.

**BALANCE OF COSTS AND BENEFITS**

56. This RIA has not attempted to quantify all the benefits associated with the three options presented. These benefits include the effects of the introduction of

Environmental Impact Assessments for defence related projects and, importantly, the shortening of the timescale for decommissioning of civilian nuclear power plants.

57. Option 1 does not have any extra costs associated with it and option 2 has costs of between £7,500,000 and £12,900,000, depending on the assumptions made (£229,000 to £397,000 annualised). Option 3 has costs between £4,600,000 and £10,400,000 (£140,000 and £321,000 annualised).
58. The major benefits accrue under option 3, in the form of cost savings. These benefits range from £7,900,000 to £26,600,000 (£242,000 to £816,000 annualised).
59. The ranges presented above suggest that the overall benefits outlined for option 3 are likely to outweigh the costs associated with bringing defence projects into the remit of the legislation.

### Uncertainties

60. Many of the figures and assumptions in this document are based on estimates of the most likely outcomes, which cannot be known for certain.
61. In particular, it is extremely difficult to estimate how many changes are likely to be required to an existing plan of work. By definition, the existing work plan should take into consideration all anticipated future events. Therefore the only changes which will occur are those which cannot be predicted. For the purpose of this document, this means that estimates of both the number of future changes and the relative costs of those changes are likely to be inaccurate.
62. Under options 2 and 3, the Ministry of Defence retains an option of applying for specific exemptions from the regulations for parts of the decommissioning process. If the MoD were to exercise this option, there would be a cost to the MoD associated with producing the exemption and a cost to the relevant Secretary of State in assessing the application. These costs would amount to approximately £46,000 for the first exemption application and £13,000 for subsequent applications. There may also be substantial cost savings, as the MoD would avoid the costs associated with producing an Environmental Statement. However, on the basis of its current understanding, the MoD does not anticipate that there will be a need for any exemptions. Therefore these costs and benefits have not been included in the analysis above.
63. The schedule set out in Table 1 implicitly assumes that the number of “changes or extensions” is independent of the regime under which a site is operating. This is the case where such changes are driven by regulatory concerns. It is possible that the introduction of option 3 would induce an increase in discretionary applications for changes by site operators, as it reduces the cost of making such a change. The possibility of such changes has not been considered in this RIA, although it can be

seen that such changes would only take place if the net benefits to the operator were greater than zero.

64. Broad estimates have also been made regarding some of the details of the military nuclear reactor decommissioning process as some of this information is classified.
65. In order to address these problems a range of possible values for the main variables have been presented to give a range of possible outcomes.

#### **SMALL FIRMS IMPACT TEST**

66. These proposed amendments will have no impact on small firms because it will effect decommissioning projects that employ substantially more employees than the number defined for a small firm.<sup>3</sup>
67. However, future work on certain aspects of a decommissioning project *could* be subcontracted to outside companies, some of which may be small firms as defined in this RIA.
68. Therefore, there could well be a scenario where work on part(s) of the site could be stopped - because there's a change/extension on that part(s) of the decommissioning project that results in a SAEE - until an Environmental Statement has been completed and consulted on. This may have a disproportionate impact on a small firm if they are sub-contracted to undertake work where such a change occurs.
69. However, the effect of this cannot be evaluated at the moment, because work on a decommissioning project(s) has yet to be sub-contracted to a small firm (as defined), and even if it was the impact on that small firm needs to be considered in relation to what ever contract is actually agreed.
70. The amendments required in order to correct the typographical errors identified by the JCSI and the changes made to the EIADR99's parent directive are not expected to have an impact on small firms (as defined).

#### **COMPETITION ASSESSMENT**

71. All three of the considered options are based upon the same set of regulations and do not impact differentially on the sector under consideration. For this reason all three options are considered together for this competition assessment.
72. The sector affected by the EIADR regulations is dominated by the Nuclear Decommissioning Authority (NDA). Although it is likely that the NDA will employ other

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<sup>3</sup> Small firms are defined as firms with fewer than 50 employees, less than £4.4m turnover pa or less than £3.18m balance sheet pa, and no more than 25% of the business owned by a non-small business.

organisations for some or all of the work carried out, it is the NDA which will be directly affected by the regulation so this competition assessment only considers the effects on the NDA.

73. The NDA is a large public body which has over 50% market share in the nuclear decommissioning sector. The regulations being considered are not likely to have any effect on the structure of the industry at this level and will not affect any other organisation to a greater or lesser extent than the NDA.
74. Any future operators in the sector would face exactly the same regulatory costs (both start-up and ongoing) as the NDA and the nuclear decommissioning sector is not characterised by a market that allows firms to choose their output mix.
75. The sector is characterised by rapid technological change, but given the above analysis, it is not considered that any of the options presented will have a significant effect on competition in the nuclear decommissioning sector.

#### **ENFORCEMENT AND SANCTIONS**

76. The proposed amendments will be enforced by HSE as per regulation 16 of the EIADR99. Applications for a decommissioning project to begin or change - if a change/extension takes place on a part(s) of a site where there's a SAEE - have to comply with the requirements of the EIADR99. There are no alternative means of compliance/enforcement, so there is no consideration on the (i.e. the alternative) likely costs and impact rates.
77. The sanctions for non-compliance are detailed in sections 18 to 26 and 33 to 42 of the Health and Safety at Work Act 1974.

#### **IMPLEMENTATION AND DELIVERY PLAN**

78. It is planned for these amendment regulations to come into force on the next common commencement date of 6 April 2006. The regulations will be announced in a press release, and key and nuclear-interested stakeholders will receive advance notice through a postal mail shot and/or email message. Additional publicity of the changes will be posted on the HSE website and mention will be made in the press release where the amendment regulations can be found. Existing resources within HSE will implement the amendment regulations. Plans on how compliance with the proposal will be enforced are detailed in paragraphs 74-75.

**POST - IMPLEMENTATION REVIEW**

79. It expected that an evaluation of the impact of these amendments would be made three years after implementation. In order to gauge the impact, information will need to be gathered from stakeholders on the effectiveness of the amendments although the means to do this will not be decided until nearer the review date. In the interim period, the effects of the proposed amendments can be monitored by any feedback received from stakeholders through the existing channels of communications.

**SUMMARY AND RECOMMENDATION**

80. A summary of the costs and benefits of the three options presented in this document are given in the following table. The ranges presented give an indication of the possible outcomes, given varying assumptions and estimates. The end points of the ranges are considered less likely to materialise than the mid points.

Option	Costs	Benefits	Net Benefit
1	0	0	0
2	£7.5M to £12.9M	0	-£7.5M to -£12.9M
3	£4.6M to £10.4M	£7.9M to £26.6M	-£2.6M to £22.0M

**Table 5: Quantified Summary Cost and Benefit Figures**  
All figures are net present values in £millions

81. There are a number of unquantified benefits associated with the options presented. Under option 2 this includes the environmental benefits of the MoD producing Environmental Statements and under option 3, the social benefit of a shorter project length for civilian (and military) decommissioning projects.
82. The average net benefit under option three is positive and, as such, it is recommended that option three is taken forward.

**Ministerial Declaration**

83. I have read the Regulatory Impact Assessment and I am satisfied that the benefits justify the costs.
84. Signed:
85. Date:

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