

**PROPOSED REGULATIONS TO IMPLEMENT DIRECTIVE 2003/105/EC
AMENDING COUNCIL DIRECTIVE 96/82/EC ON THE CONTROL OF MAJOR
ACCIDENT HAZARDS INVOLVING DANGEROUS SUBSTANCES (SEVESO II)**

REGULATORY IMPACT ASSESSMENT (FINAL)

PURPOSE AND INTENDED EFFECT

Issue

1. This Regulatory Impact Assessment examines the costs and benefits of regulations to implement Directive 2003/105/EC that amends Council Directive 96/82/EC (known as the Seveso II Directive) on the control of major-accident hazards involving dangerous substances.

Background

2. The Seveso II Directive aims to prevent major accidents and limit their consequences for people and the environment. It sets out measures which apply to establishments that hold or use specified dangerous substances, or specified generic classes of dangerous substances above qualifying quantities listed in the Directive. There are two levels of regulatory oversight and the level of oversight is determined by the quantities of dangerous substances held. The lower level of control requires notification, development of a major accident prevention policy, the application of a land use planning policy and inspections. In addition the upper level requires a detailed safety report, production of emergency plans and provision of information to the public. The Directive was implemented in Great Britain through the Control of Major Accident Hazards Regulations 1999 (COMAH).

Objectives

3. The amending Directive is aimed at broadening the scope of Seveso II rather than a major revision of it. It takes account of recent industrial accidents (particularly a mining accident in Baia Mare, Romania in 2000 that resulted in cyanide entering a river and an explosion at a fireworks factory in Enschede in the Netherlands in 2000 in which 20 people were killed), and the results of studies on carcinogens and substances dangerous for the environment carried out by the Commission at the request of the Council when the Directive was adopted in 1996.

4. The key features of the amending Directive are:

- a broadening of scope with respect to mining/quarrying;
- a redefinition of ammonium-nitrate to cover lower percentage composition, and new classes covering self-sustaining decomposition and reject material;
- new thresholds for potassium nitrate fertilizers;
- seven new carcinogens, and raised threshold limits for all carcinogens;
- a new definition of automotive petrol to include diesel and kerosene, with thresholds that have been halved;
- the redefinition of the classes for explosives;

- lower qualifying thresholds for substances dangerous for the environment;
- a change to the aggregation rule to be applied to all substances classified as toxic, dangerous for the environment, flammable and oxidising; and
- administrative provisions for establishments newly covered by the Directive to have a period of time to comply.

Risk assessment

5. A large part of risk control at premises involving dangerous goods is aimed at the prevention of serious accidents which occur infrequently. The accident record is unreliable with respect to estimating safety risks, which are typically subject to quantitative risk assessment. Data on the number of reported accidents at sites newly brought under the scope of the regulations, for example, are not collated centrally. Hence, it is not possible to establish an accurate 'baseline' level of risk against which the benefits of the amendment can be assessed. In the benefits section, we use a study of accidents in the UK chemical industry to indicate the potential level of risk and benefit in terms of physical damage to plants from bringing new sites under the scope of the COMAH regulations. However, in advance we recognise that the characteristics and risks associated with the newly introduced sites may differ from those in the study.

Options considered

6. As the provisions in the amending Directive relate to requirements in Seveso II that were implemented through legislation, the amendments will also require implementation through regulations. We considered implementation through an Approved Code of Practice or guidance but concluded these would be insufficient and could lead to infraction proceedings. It would also be inconsistent with our original transposition of Seveso II, and could cause confusion for stakeholders. There are no provisions in the amending Directive that Great Britain would wish to either over- or under-implement for domestic reasons.

Information sources and background assumptions

7. A key source for the cost data used in this partial assessment is the Entec report '*Safety report regime – evaluating the impact on new entrants to COMAH, 2003*'¹. The Entec study estimated the costs of compliance with the COMAH regulations following their implementation (COMAH replaced the previous Control of Industrial Major Accident Hazards (CIMAH) regulations). The implementation of Seveso II RIA used cost estimates based on speculative industry information. The cost estimates contained in this RIA are considered to be superior to the previous estimates as they are ex-post estimates rather than ex-ante. Information from the Entec report on possible benefits of COMAH has also been included in the benefits section. In addition Det Norske Veritas (DNV)² was commissioned by the Department for Environment, Food and Rural Affairs to undertake two studies to assess the number of sites which will be brought into the scope of COMAH based on the storage of 'Substances Dangerous for the Environment', R50, R50/53 and R51/53 substances

¹ "Safety report regime – evaluating the impact on new entrants to COMAH", Entec UK Ltd, 2003

² Latest report: COMAH Site Threshold Levels", Det Norske Veritas, Job number 804003, July 2001

at current and suggested alternative thresholds. The substances examined by the study were those which will be included solely because of the risk they pose to the environment and will not be included under "toxic (to humans)", "flammable" or any other heading. The Environment Agency have examined the reports and provided estimates for the number of sites affected but the Agency notes that the numbers are subject to some uncertainty because of the age of the reports and assumptions about inventories that have had to be made. These estimates have been used in this RIA.

8. Costs and benefits have been discounted at a rate of 3.5%. The appraisal period is 10 years. All costs and benefits have been discounted back to the base year 2003. To estimate the cost of the proposed regulations it has been assumed that there will be full compliance.

Equity And Fairness

9. The only equity and fairness issue identified concerns the fact that EU firms will be affected by the Directive, while non-EU firms will not. To the extent that EU firms directly compete with non-EU firms, the Directive will have an asymmetric impact on the different market players. This issue is further discussed in the competition assessment section.

Atypical Workers

10. No issues affecting atypical workers have been identified for the proposal.

BENEFITS

Health and Safety Benefits

11. A Review of UK and Overseas Major Industrial Accidents since Flixborough 1974³ details the twenty UK accidents with the highest numbers of casualties. There were 30 fatalities and 877 major injuries in the twenty-four years following the Flixborough accident. Using this data, the cost in an average year is £7.2 million in current prices.

12. As described in detail in the section 'Business sectors affected', the total number of sites, that either enter COMAH for the first time, or move to a higher classification, is 224 - 249. This represents approximately 19.3%-21.5%⁴ of the existing total of sites. Using this range the amendments to the regulations cover a percentage of the total cost of injuries that equates to a monetary value of £1.5 to £1.7 million per year, a net present value over the appraisal period of £12.9 to £14.4 million.

13. A recent evaluation study carried out on behalf of HSE by Risk Solutions has estimated the benefits arising as a result of the reduction in major accidents of the COMAH 1999 regulations. The benefit, which covers all COMAH sites is estimated to be a net present value of £106 million, with £5 million of this being attributed to casualties and the remainder being the societal benefit. The percentage reduction in

³ .P Fewtrell (WS Atkins) and I Hirst (HSE, CHID) "A review of high-cost chemical/petrochemical accidents since Flixborough (1974)", IChemE Loss Prevention Bulletin, 140, 1998.

⁴ This range also includes the sites that are changing COMAH status (however, the change from low to high COMAH status is significant and likely to achieve a level of benefits reflecting this).

major accident frequency and impact achieved due to implementation of COMAH is taken from questionnaires. The reduction in costs per major incident was based on the survey results of all respondents. As these estimates are based on dutyholder perceptions, the actual benefits obtained are highly uncertain.

14. Action to mitigate risks will also benefit members of the public. We do not have information on incidents involving members of the public in sufficient detail to make estimates for the risk from smaller scale events. We also know that no member of the public has been killed off-site as a result of a serious incident in chemical/petrochemical manufacture. Quantitative risk assessments however, do indicate the presence of significant risks, which would be mitigated to some extent by the proposals (or action prompted by the proposals). The quantitative benefit of reduced risk to the public cannot be estimated but could be substantial.

Benefits to Business.

15. We cannot estimate the benefits to typical sites brought into the proposal's scope since this information is site specific and varies greatly. We can however, look at the potential benefits of the COMAH regime as a whole and form a judgment as to the scale of potential benefits at the aggregate level.

16. Research on previously published estimates of the scale of losses incurred following high cost chemical/petrochemical accidents have been undertaken by HSE in conjunction with W S Atkins⁵. The report found a lack of reliable data in the public domain and conflicts between reported values in cases where data was available. These differences are ascribed to the wide scope of costs involved, commercial sensitivity, and changes in monetary values over time and simple clerical error. Therefore the following analysis is based on estimates and subject to estimation error.

17. The report estimated that the total cost of the 20 major chemical/petrochemical accidents since Flixborough was between £300 to £400 million in 1996 prices. Included in these costs are the costs of reconstruction and lost production (as well as the costs associated with any legal action). Costs excluded from these incidents include indirect production costs (such as loss of business, or forced sale of raw material), off-site damage, personnel costs associated with injury events, civil emergency response, legal costs and public relations costs. Mitigating this to a certain extent is that damaged plant and equipment would have been replaced at some point in the future. Nevertheless, the costs are equivalent to a figure of around £19.5 to 26 million⁶ each year at current values.

18. An analysis of 119 events at petrochemical, chemical and refinery sites⁷ concluded that the business interruption losses were on average 2.7 times the property damage losses (with wide variation between the individual cases). This would increase the yearly loss figure to around £50 to 70 million on a conservative basis (allowing for some overlap in the coverage of costs between the reports).

5.P Fewtrell (WS Atkins) and I Hirst (HSE, CHID) "A review of high-cost chemical/petrochemical accidents since Flixborough (1974)", IChemE Loss Prevention Bulletin, 140, 1998.

⁶ Calculated by roughly dividing the total cost by the years covered - £300 to 400m / 24 and uprated to current prices using the nominal GDP series.

⁷.Loss Control Newsletter, January 1997.

19. Future catastrophic risks will be lower than these figures indicate because safety has improved over the last two decades. The monetary figures above only relate to the very highest risks (over a quantum of risk) which include many less than catastrophic incidents that could cause significant disruption and damage, require plant evacuation or shutdown, and possibly result in injuries to on-site personnel. It is impossible to estimate the total risk in monetary terms given the uncertainties involved. Using the £50 to 70 million figures above, it is assumed that the current risk at high hazard sites lies in the range of £40 to £80 million per year in monetary terms even if the part of the risk relating to the most serious incidents has been significantly reduced.

20. As described earlier and in the section ‘Business sectors affected’, the total number of sites, that either enter COMAH for the first time, or move to a higher classification, represents approximately 19.3%-21.5%⁸ of the existing total of sites.

21. If the risks at both new sites and sites subject to a higher classification are commensurate with those at existing COMAH sites then we would expect the monetary value of the total risk from the sites affected to have a magnitude of between £7.7 million and £17.2 million each year, which is equivalent to £66 million - £148 million over ten years in present terms.

22. However, it is not possible to quantify the risk reduction that will be achieved by bringing into scope new sites and by changing the status of other sites. In addition, whether the risks at those sites brought under scope by these changes are similar to those of the majority of COMAH sites is a matter of judgment.

23. As part of the Entec⁹ report, participants were asked their views regarding the possible benefits of COMAH to their establishment. They suggested many benefits of COMAH including:

- 59% more awareness amongst the workforce of major accident hazards
- 37% more systematic analysis of major accident hazards
- 36% better understanding of major accident hazards
- 8% improved dialogue with Competent Authority
- 5% better knowledge of neighbours’ activities

24. 26% of those expressing an opinion stated that COMAH had benefits to their business beyond compliance.

COSTS

Business sectors affected

25. The amendments will affect all current COMAH sites, bring a number of new sites into its scope and upgrading some sites from lower tier to top tier status. The sites affected will mainly be operated by businesses in the basic chemical, petroleum, electricity and water sectors, and those involved in the manufacturing and storage of

⁸ This range also includes the sites that are changing COMAH status (however, the change from low to high COMAH status is significant and likely to achieve a level of benefits reflecting this).

⁹ “Safety report regime – evaluating the impact on new entrants to COMAH”, Entec UK Ltd, 2003

explosives. Sites in other sectors will be affected if they store above the threshold quantities of dangerous substances as specified by the Regulations. HSE estimates that there are currently 360 top tier sites and 800 lower tier sites. The following paragraphs set out the expected number of sites coming into scope or upgrading from lower tier to top tier status.

26. On a preliminary basis using data from several sources we estimate that the amendments will affect a total of between 224 and 249 sites. The numbers of sites in the different risk categories are given in the paragraphs and table below.

Carcinogens

27. Studies on carcinogens carried out by the European Commission proposed adding seven substances to the list of ‘carcinogens’ already contained in Annex I, Part 1 of the Directive. Qualifying limits for the whole group of carcinogens have also been increased. The increase will have the effect of excluding some establishments (such as hospitals or research institutes) from the scope of the Directive that were not originally targeted by the inclusion of the list of carcinogens, and that are not currently COMAH sites. An initial examination by HSE on the effect of these changes indicates that around 15 sites will be brought into the COMAH regime at the lower tier, 16 will be brought into COMAH at top tier and 34 existing COMAH sites will move from lower tier to top tier.

Explosives

28. It is proposed to amend the definitions of explosives to reflect the hazard associated with each type. It was considered that although consumer fireworks represent a hazard and therefore should come under the Directive, the hazard is substantially less than for other fireworks and explosives so should be treated differently. The coverage of pyrotechnic establishments in Great Britain already goes beyond that required by the Directive. A preliminary survey by HSE indicates that the changes will bring up to 34 sites into the COMAH regime at the lower tier and up to 10 existing COMAH sites will move from the lower tier to the top tier.

Petroleum products

29. The named substance “automotive petrol and other petroleum spirits” is replaced with a new category ‘petroleum products’ which includes medium oil distillates (gasolines, naphtha, kerosene and gasoils) with reduced qualifying thresholds. Data from the DNV report suggests that the changes will bring a minimum of 28 sites into the COMAH regime at lower tier and a minimum of 18 existing COMAH sites will move from lower tier to top tier. Allowing for some uncertainty in these figures, the Environment Agency have advised that a maximum estimate of the numbers affected could be 39 and 22 respectively.

Substances dangerous for the environment

30. In the light of the incident in Baia Mare, Romania and the outcome of studies by the European Commission the thresholds are to be lowered for substances dangerous for the environment. The DNV report and discussions with the Environmental Agency indicate that this amendment will bring between 26 and 32 sites into the COMAH regime at the lower tier and 21 to 25 existing COMAH sites will move from the lower tier to the top tier.

Ammonium Nitrate

31. The Commission's amendment on ammonium nitrate is in response to the explosion at a fertiliser factory in Toulouse, France in 2001. The amendment essentially maintains the current classes of ammonium nitrate but makes a detonation test mandatory, adds a class for fertilizers that are capable of self sustaining decomposition (i.e. once alight continue to burn producing toxic gases), and adds an additional class for reject material from the manufacturing process. This is likely to bring more sites within the scope of the Regulations. It is however, very difficult to give a good estimate of the number of sites affected as the quantities of reject material produced are not known. Our best estimate is 2 top tier and 20 lower tier sites.

Table 1: Number of sites affected by changes in scope and COMAH status

Risk category	Effect on site			
	Enters COMAH as lower tier	Enters COMAH as top tier	Moves from lower to top tier	Total
Carcinogens	15	16	34	65
Explosives	34	0	10	44
Petroleum products	28 - 39	0	18 - 22	46 – 61
Substances dangerous for the environment	26 - 32	0	21 – 25	47-57
Ammonium nitrate	20	2	0	22
Total	123-140	18	83 - 91	224 - 249

Compliance costs for individual new and upgraded sites

32. As a consequence of the proposed changes to the definitions and qualifying quantities of dangerous substances covered by COMAH, compliance with other COMAH provisions automatically becomes necessary. These are:

- a risk assessment
- b notification to the competent authority (by new lower and top tier sites)
- c preparation of a MAPP (lower tier only);
- d preparation of a safety report (top tier only);
- e on and off-site emergency plans (top tier only); and
- f provision of information to the public (top tier only).

33. Data from the Entec report (see paragraph 7) can assist with the estimation of some of these costs. In particular, it provides information on the cost of assessing the hazards (cost of analysis) and the cost of drafting the MAPP or safety report (cost of writing). The average cost of analysis for new entrant top tier establishments is estimated at £64,000 and the writing cost at £71,000. For lower tier establishments the figures are £9,000 and £8,000 respectively. We assume that corresponding costs for establishments whose status changes from lower to top tier is the difference of the

values estimated at top and lower tier, that is £55,000 for analysis costs and £63,000 for writing costs.

34. As for the remaining costs, estimates from a previous RIA suggest the following figures: £1,600 for notification; £17,300 for provision of information; £10,600 for preparing an emergency plan, £5,300 for the initial testing of the plan and £2,700 each year thereafter for routine testing¹⁰.

35. Additional costs stem from the COMAH Competent Authority¹¹ charges and from cost recovery action undertaken by other authorities. The average charges per low tier site and top tier site levied by the Competent Authority have been estimated at £2,700 and £6,300 per year¹². This translates into £23,000 and £54,000 over the appraisal period. The corresponding estimates for a low tier site upgrading to a top tier site are £3,600 per year and £31,000 over the appraisal period. Costs recovered by other authorities have been estimated at £10,500-£24,500 over the appraisal period (£1,200-£2,800 per annum)¹³.

36. The Entec study also considered 'control' costs and estimated these at £376,000 for the average new top tier establishment and £160,000 for the average lower tier site. On this basis the 'control' cost for an establishment that moves from lower to upper tier would be £216,000.

37. The Entec report identified 'control' costs as the costs of changes to arrangements for managing major accident hazards identified as a result of writing a MAPP or safety report (one of the benefits identified in the Entec report was that structured consideration of safety driven by MAPPs and safety reports identifies opportunities for improvements).

38. The duty to identify, assess and manage hazards and risks already exists in other health and safety at work/environmental legislation that applies to most sites. There is therefore an argument for excluding such costs from this RIA on the basis that they relate to measures that should already have been taken and costed for under other legislation. (It is also worth noting that existing safety control measures in certain industries e.g. explosives utilities sectors, may already be higher than those required by general legislation (or COMAH) because of, for instance, regulatory permissioning regimes required by specific legislation or safe ways of working.)

39. On the other hand, there is a case for their inclusion in this RIA as compliance with COMAH can act as a catalyst for the identification of areas where improvements are necessary, and the taking of additional safety measures. When estimating total costs, we have therefore decided to show two figures, one that includes the cost of additional safety measures and one that excludes them.

¹⁰ Original cost figures were in 1998/99 prices and have therefore been updated using the Consumer Price Index.

¹¹ COMAH is enforced by a Competent Authority comprising HSE and the Environment Agency in England and Wales and HSE and the Scottish Environment Protection Agency in Scotland.

¹² Estimates obtained using actual charges to a sample of existing top tier and low tier sites over the past 3 and half years.

¹³ For more information on how these latter costs have been calculated see section 'Costs to Competent Authority and others' further below.

40. All the above estimates are synoptically shown in the following table:

Table 2: Costs to business for individual new and upgraded sites: present value over appraisal period (£ '000).

Risk category	Effect on site (£'000)		
	Enters COMAH as lower tier	Enters COMAH as top tier	Moves from lower to top tier
Analysis	£9	£64	£55
Writing	£8	£71	£63
Notification	£2	£2	
Information		£17	£17
Emergency Planning and testing		£36	£36
Competent Authority charges	£23	£54	£31
Costs recovered by other authorities ¹⁴		£11-£24	£11-£24
Total excluding control costs	£42	£255-£268	£213-£226
Control costs	£160	£376	£216
Total including control costs	£202	£631-£644	£429-£442

Total compliance costs to business

41. Using the above information on the number of sites and unit costs per site the aggregate cost over the appraisal period associated with all new and upgraded sites is £27.4 - £31.3 million (£3.2 - £3.6 million per annum) excluding additional safety measures and £71.7 - £80.1 million (£8.3 - £9.3 million per annum) including additional safety changes. The cost breakdown by risk category is shown in Table 3 below.

¹⁴ Cost initially borne by LAs and Emergency Services For more information on this item see 'Costs to Competent Authority and others' further below.

Table 3: Costs to business for all new and upgraded sites: present value over appraisal period (£ '000)

Risk category	Effect on site (£'000)			
	Enters COMAH as lower tier	Enters COMAH as top tier	Moves from lower to top tier	Total
Carcinogens	£623	£4,071 - £4,294	£7,238 – £7,712	£11,931 - £12,629
Explosives	£1,412	£0	£2,129 - £2,268	£3,541 - £3,680
Petroleum products	£1,163 - £1,620	£0	£3,832 - £4,990	£4,995 - £6,610
Substances dangerous for the environment	£1,080 - £1,329	£0	£4,470 - £5,671	£5,550 - £7,000
Ammonium nitrate	£831	£509 - £537	0	£1,340 - £1,367
Total excluding control costs	£5,109 - £5,815	£4,579 - £4,830	£17,669 - £20,641	£27,357 - £31,286
Control Costs	£19,680 - £22,400	£6,768	£17,928 - £19,656	£44,376 - £48,824
Total including control costs	£24,789 - £28,215	£11,347 - £11,598	£35,597 - £40,297	£71,733 - £80,110

Costs to all COMAH sites

42. Amendments to the Seveso II Directive will require top tier operators to provide a map, image or equivalent description as part of their safety report. Latest figures from HSE indicate that there are currently 360 top tier COMAH sites. This figure will rise to 461-469 sites as the Amendment Regulations will lead to a further 18 establishments entering COMAH for the first time at top tier level and another 83 to 91 will move from lower to top tier status. The existing COMAH regime already requires operators to provide information on effect or consequences data in the safety report. As this can often be complicated, some sites already opt to show these effects in map form. Furthermore, HSE estimates that at least 50%, and possibly as many as 66%, of all operators currently choose to provide this information in a map form to the competent authority.

43. The cost of supplying a map, at between £25 and £100 per map, is estimated at £18,300 - £75,300 over the appraisal period (£2,100 - £8,700 per annum). This cost assumes that 50% (lower end of the range) already have maps and they will be updated every 5 years. We are aware that these maps or images would also need to be updated if there were any modification to these top tier COMAH sites. We estimate that this will not produce additional costs on top of those included because we have taken the lower end of the scale for those who already have a map or image.

44. A number of other requirements will result in some modest ongoing costs, principally notifications. Operators were previously required to notify the Competent Authority of any change in the quantity or form of substances held. Now they are also required to notify the competent authority of any modifications to their establishment that could have significant repercussions on major accident hazards. HSE estimates

that this amendment could result in about 50 notifications a year. Notification costs are estimated at £1,600 per site. Discounted, over 10 years this gives the amendment a net present value of £685,500 (£79,600 per annum).

45. Finally, Article 13 of the Directive 96/82/EC requires member states to ensure that the safety report is made available to the public (information that is sensitive because of commercial or security reasons can be withheld). The operator will be required to supply an amended safety report, excluding sensitive information, to the competent authority that is suitable for public disclosure. The Competent Authority encourages operators to write their safety report with this in mind (one way is to include such information in an annex). We expect the cost of this to be £2,000 per amended report. It is expected that 5-10% of top tier sites (23-47) per year will prepare an amended report. This yields ca. £397,000 - £807,000 over the appraisal period (£46,100 - £93,800 per annum).

46. Using the above information on the map/image, notification and modification costs, the cost of Amendment Regulations for all sites is estimated between £1.1 - £1.6 million over the appraisal period (£127,900 - £182,200 per annum).

47. The total cost to business of the Regulations is £28.5 - £32.9 million (£3.3 - £3.8 million per annum) excluding additional safety measures and £72.8 - £81.7 million (£8.5 - £9.5 million per annum) including additional safety measures.

Costs to Competent Authority and others

Competent Authority

48. The Competent Authority is required by Government to recover the costs of its regulatory activities under COMAH. This includes work associated with the examination of safety reports, inspection to assess compliance, and the investigation of complaints and incidents. The recovered costs are included in the cost to business section.

49. The Competent Authority cannot recover certain costs relating to legal proceedings, industrial tribunals, the assessment of off-site emergency plans, or the provision of advice. HSE's records show that for every hour of COMAH chargeable work, about 4 hours of non-chargeable work is performed. However, recorded non-chargeable work includes also work not related to COMAH. In what follows, it is assumed that for every COMAH chargeable hour, 2 hours of non-chargeable COMAH work is performed. This implies total non-recoverable costs of £12.7 - £14.0 million over the appraisal period (£1.5-£1.6 million per annum)¹⁵.

Costs to Local Authorities (LAs)

50. LAs are required to prepare off-site plans for top tier establishments. COMAH provides for LAs to charge the operator for any reasonably incurred costs associated with the preparation, review, revision and testing these plans. Information provided by the Emergency Planning Society suggests that the cost to a LA of preparing an off-site emergency plan lies between £6,000 and £10,000. The cost of reviewing and revising a plan as necessary at least every three years is £500-£1,000. This yields a

¹⁵ Non-chargeable hours are further discussed in the uncertainty section of the RIA.

cost per site over the appraisal period of £7,300 to £12,500. LAs are assumed to recover 80% of these costs from site operators.

51. The LA cost of testing an off-site plan at least once every three years is £1000-£2000 for a 'table-top' exercise, and £6000-£10,000 for a normal 'live-play' exercise. This implies a cost of testing between £2,500 and £25,300 over the entire appraisal period. Information from a survey carried out by the Emergency Planning Society in 2003 suggested that approximately 32% of LAs recover the costs of testing from operators, which recognises that there is mutual benefit to LAs in carrying out the exercise.

52. Total costs per site to LAs are therefore £9,800-£37,900 over the appraisal period. Of these, between £6,600 and £18,100 are recovered from industry. This leaves LAs with a net cost per site of £3,200-£19,700 over the appraisal period.

Costs to Emergency Services

53. COMAH provides for the emergency services to recover any reasonably incurred costs associated with their participation in testing off-site plans. They are unable to recover any costs associated with their contribution to the preparation, review and revision of off-site plans. Information from the Fire Service suggests the following cost estimates: £6,000-£10,000 for plan preparation; £500-£2,000 for review/revision; £1,000-£4,000 for testing. Assuming that review/revision takes place every three years yields a present value of £1,300-£5,100 over the appraisal period (£147-£589 per annum). Testing costs are the only costs to be partially recovered. If testing occurs every 3 years, their present value over the appraisal period is £2,500-£10,100. It is estimated that 32% of it is recovered.

54. Total costs per site to Fire Services are therefore £9,800-£25,200 over the appraisal period. Of these, between £800 and £3,200 are recovered from industry. This leaves Fire Services with a net cost per site of £9,000-£22,000 over the appraisal period.

55. Information provided by the Association of Chief Police Officers during the consultation period indicates that Police's cost of planning amounts to £11,600, while annual testing and liaison/meetings have a cost of £2,300 and £900, respectively. Most of these costs are borne by the Police themselves with only 15% of testing cost being recovered.

56. Total costs per site to Police are £39,300 over the appraisal period (£4,600 per annum). Of these, only £3,100 are recovered from industry. This leaves Police with a net cost per site of £36,200 over the appraisal period.

57. Non-recovered costs to LAs and Emergency Services can be obtained by multiplying the cost per site by the number of sites. This yields £4.9 - £8.5 million over the appraisal period (£0.6 - £1.0 million per annum). LAs bear between 6.6% and 25.3% of this cost, while the rest falls on the Emergency Services. A breakdown by risk category is shown in Table 4.

Table 4: Non-recovered costs to LAs and Emergency Services for all new and upgraded sites: present value over appraisal period (£ '000)

Risk category	Effect on site (£'000)			
	Enters COMAH as lower tier	Enters COMAH as top tier	Moves from lower to top tier	Total
Carcinogens	0	£774-£1,247	£1,645-£2,650	£2,420-£3,897
Explosives	0	£0	£484-£779	£484-£779
Petroleum products	0	£0	£871-£1,715	£871-£1,715
Substances dangerous for the environment	0	£0	£1,016-£1,948	£1,016-£1,948
Ammonium nitrate	0	£97-£156	£0	£97-£156
Total	0	£871-£1,403	£4,017-£7,092	£4,888-£8,495

58. On top of the costs shown in the table above, the various authorities will incur familiarisation and training costs following the introduction of the amendment. Information provided by HSE, EA, SEPA and the police indicate that these costs will amount to £9.6 million over the appraisal period (£1.1 million per annum). Nearly all these costs will fall on the police force.

59. Adding together all costs to competent and other authorities yields a total of £27.2 - £32.0 million over the appraisal period (£3.2- £3.7 million per annum).

Total costs to society

60. The total costs to society over the appraisal period are £55.6 - £64.9 million (£6.5 - £7.5 million per annum) excluding additional safety measures and £100.0 - £113.7 million (£11.6 - £13.2 million per annum) including additional safety changes. These costs include all costs to industry and to competent authorities.

61. Costs can be classified either as policy or as implementation costs depending on whether they are directly attributable to the policy goal or not. With regard to business, only the following costs are considered to be implementation costs: writing, notifications, provision of information, production of maps, report amending and competent authority charges. These amount to £16.9 - £18.8 million over the appraisal period (£2.0 - £2.2 million per annum) with 62% (or £10.6 - £11.8 million) being paperwork costs¹⁶. All costs that do not fall on business have been classified as policy costs¹⁷. Hence, total policy costs to society over the appraisal period amount to £38.7 - £46.0 million (£4.5 - £5.3 million per annum) excluding additional safety measures and £83.0 - £94.8 million (£9.6 - £11.0 million per annum) including additional safety changes.

¹⁶ The only implementation costs that are not considered to be paperwork are the competent authority charges.

¹⁷ The only exception is familiarisation costs which are a negligible fraction of the costs borne by competent and other authorities.

Impact on small and medium sized businesses

62. Only a very small number of top tier COMAH sites is likely to be operated by small companies. Costs may be disproportionately higher for those sites (if any) that are operated by small/medium sized companies. The costs of a major incident are however, far less likely to be absorbed by these companies, especially if the company operates only one site.

Competition Assessment

63. A number of markets will be affected by the Amendment Regulations. Three have been selected to examine the competition effects of the changes. The three markets are refineries, medium-sized fuel storage and distribution, and power generation utilities.

Refineries

64. The market for refining contains 11 firms. All companies are large (with two particularly large companies) although no single firm supplies more than 20% of the market. The regulatory changes relevant for refineries are an expanded definition for automotive petrol and the qualifying thresholds being halved.

65. Neither of these changes will have a significant effect on the market because all refineries currently fall into the higher tier of regulation and they will continue to do so after the Regulations come into force. For this reason there are no additional competition concerns raised in this market by the Amendment Regulations.

66. It is not necessary to produce a detailed competition assessment.

Medium-sized fuel storage and distribution

67. Medium sized fuel storage and distributors are affected by the expanded definition of petroleum products and the halving of qualifying thresholds. There will be a substantive effect in this market with an increased number of firms subject to either the higher or lower tier of the regulation. Market concentration will not be a concern because no firm supplies more than 10% of the market.

68. The regulation costs firms will face depend upon the tier into which they fall. This is determined by the quantity of petroleum products held on site. Firms in the higher tier will face higher costs than those in the lower tier but costs are similar for firms within each tier. These differential costs could cause concern if it were likely that they will have an effect on the number or size of firms operating in the market i.e. changes the market structure.

69. Evidence from the Entec report¹⁸ indicates that although a number of firms close to the lower threshold might slightly reduce the quantities they hold (thus avoiding COMAH classification), this number of firms is likely to be small with the quantities involved minimal. Thus it is unlikely to have a significant effect on the overall market structure.

70. There are no other competition concerns and the regulation will not impose different costs on entrants compared to incumbents.

¹⁸ "Safety report regime – evaluating the impact on new entrants to COMAH", Entec UK Ltd, 2003

71. It is not necessary to produce a detailed market assessment. Although there is a potential concern about a change in the market structure brought about by firms altering their production to avoid COMAH classification, this is the only possible competition issue and based on the Entec report, it is unlikely to cause a significant problem.

Utilities (Power Stations)

72. Power stations will be affected by the classification of hydrazine as a named carcinogen (if they are unable to engineer out the use of hydrazine). This change will produce a one-off cost associated with the administrative requirements of COMAH (i.e. the completion of safety reports). Any safety control measures (see para 35) are likely to be insignificant due to existing industry wide safety systems.

73. The regulation is unlikely to have an effect on the size or number of firms in the market because all firms will fall within the higher tier of the regulation. For this reason the regulation will have a similar effect on all firms in the market and all potential entrants to the market.

74. The power generation market contains a small number of large businesses operating 30-40 power stations. There is a degree of concentration with three or four large firms but their combined output, measured crudely by generating capacity, does not exceed 50% of the market.

75. The market has experienced technological change during the last 20 years with the shift from coal to gas fired stations but the potential for further shifts in this respect are nearly exhausted. Further rapid technological change is unlikely.

76. It is not necessary to produce a detailed competition assessment for this market. The only competition issue raised was market concentration but, as all firms will be equally affected, this should not be of concern.

Conclusions

77. There are no substantive competition concerns that arise from the Amendment Regulations in the three markets considered.

78. As mentioned in the equity and fairness section, EU companies will have increased operating costs and may therefore find themselves at a competitive disadvantage vis-à-vis non-EU firms that are not subject to the same legislation. As a consequence, some loss of GB/EU business may result. This type of effect is common to all regulations impacting on sectors open to international competition and it is difficult to quantify. Moreover, a loss of domestic business does not imply *per se* lower market competition. Only if the amendment led to market concentration, it would have an adverse effect on competition. The preceding analysis, however, suggests that an increase in market concentration is not likely to occur.

Environmental Impacts

79. The environmental benefits of preventing a serious incident where a substance hazardous to the environment is released could be very significant. We therefore expect the environmental impact of the proposals to be positive, though unquantifiable.

Balance Of Costs And Benefits

80. The total costs to society over the appraisal period are £55.6 - £64.9 million (£6.5 - £7.5 million per annum) excluding additional safety measures and £100.0 - £113.7 million (£11.6 - £13.2 million per annum) including additional safety changes.

81. The total risk that the Amendment Regulations are addressing is estimated at £79.4 - £162.2 million over the appraisal period (£9.2 - £18.9 million per annum). However, it has not been possible to quantify the risk reduction that the Regulations will achieve.

82. It follows that the available evidence does not allow us to unambiguously establish whether the benefits from the new regulations will outweigh the costs. The uncertainty about whether benefits exceed costs extends to the specific categories. The cost/benefit balance for these cannot be estimated without reference to quantitative assessment of the sites.

83. Nevertheless, the cost and benefit ranges allow us to work out how large the reduction in risk must be for benefits to balance costs. Specifically, in the best-case scenario (i.e., low cost, large total risk addressed) the amendment needs to achieve a reduction in risk of at least 34% for benefits to balance costs. In the worst-case scenario (i.e., high cost, small total risk addressed), cost will certainly exceed benefits; in particular, even if the amendment was to remove risk completely, cost would still be 43% larger than benefits.

Uncertainties

84. There is uncertainty surrounding the number of sites that will come into the scope of the amendment or will change their COMAH status. The estimates used were based on the Det Norske Veritas report which were the best available.

85. The level of risk addressed by the amendment is uncertain. A monetary estimation of the potential benefits of COMAH was made based on the HSE/ WS Atkins report. Duty holders' assessments of the benefits of COMAH were taken from the Entec report.

86. There is a degree of uncertainty about the costs of compliance due to changes in scope and COMAH status. Cost estimates from the Entec report were the best information available but they were averages, so that costs for individual sites may be substantially different from the estimates of this RIA.

87. Finally, non-recoverable cost to competent authorities were estimated to be twice the recoverable costs. However, this estimate is highly uncertain and these costs may turn out to be higher (up to four times the recoverable costs) or lower. For example, if they turned out to be three times as large as the recoverable costs, total costs to the competent authorities (and, hence, to society) would increase by £6.3 and £7.0 million over the appraisal period. They would decrease by the same amount if, instead, non-recoverable costs turned out to be approximately the same as the recoverable ones.

Arrangements for monitoring and evaluation

88. Monitoring and evaluation of the Amendment Regulations will be incorporated into existing arrangements for the COMAH Regulations. As part of this, Directive 96/82/EC as amended requires Member States to provide the EC with a three-yearly report on a range of information on implementation of the Directive.