

## **THE CARRIAGE OF DANGEROUS GOODS AND USE OF TRANSPORTABLE EQUIPMENT REGULATIONS 2004**

### **REGULATORY IMPACT ASSESSMENT (POST-CONSULTATION)**

#### ***PURPOSE AND INTENDED EFFECT***

##### **Issue**

1. Great Britain (GB) is required to harmonise regulations concerning the carriage of dangerous goods across the European Union (EU) boundaries according to the technical specifications hereafter referred to as ADR/RID.

##### **Risk assessment**

2. ADR/RID harmonisation as implemented in GB regulation covers the risks associated with the carriage of dangerous goods. This section reports estimates of the overall risks associated with the carriage of dangerous goods in GB. It should be noted that these proposed regulations, in implementing amendments to ADR/RID, are expected to impact only on specific areas of the overall risk from the transport of dangerous goods. The effect of the proposed regulations is discussed in the benefits section below.
3. Table 1 presents estimates of the risk of fatalities arising from the carriage of the most commonly carried dangerous goods, as found by the Advisory Committee on Dangerous Substances<sup>1</sup>. We have supplemented this information with the estimated likelihood of an event causing serious injury, based on the world-wide accident record from the same source. This suggests a ratio of fatalities to injuries of roughly 1:3 for road traffic incidents not involving explosives, and 1:25 for rail traffic incidents, and any incident involving explosives<sup>2</sup>.
4. To uprate the figures to 2003, we assume the trend in overall risk follows that of the trend in reported dangerous occurrences and fire brigade call outs. Both these sets of statistics have seen a 40% fall between 1990/1991 to 1995 (we assume no further fall since then). We therefore reduce the expected number of fatalities and injuries with respect to road (and explosives by any mode) by 40%. We leave the injuries predicted for rail (excluding explosives) unchanged, given the nature of the industry.

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1 "Major hazard aspects of the transport of dangerous substances", HSC, HMSO, 1991

2 The large difference in these ratios reflects the nature of road traffic incidents, in which widespread injuries are generally more limited than rail, but fatalities amongst road users are relatively more common.

**Table 1: Estimated injury risk for GB carriage of dangerous goods**

	Expected number of injury events per year, 1991		Estimated expected number of injury events per year, 20035	
	Fatalities	Injuries	Fatalities	Injuries
Transport by Road	1.90	5.70	1.14	3.42
Transport by Rail	0.40	10.00	0.40	10.00
Transport of Explosives by Road or Rail	0.02	0.50	0.01	0.30
TOTAL	2.32	16.20	1.55	13.72

5. There are many other costs incurred with an incident involving dangerous goods. Any non-injury event normally requires attendance by the emergency services, whether or not the goods actually escape or combust. If the goods do escape or combust, clean up costs and disruption can be considerable. We assume that costs are likely to vary between £10,000 and £100,000 depending on the nature of the incident. Existing figures suggest we might expect 500 emergency service call-outs each year of which 100 (allowing for some under-reporting) might be notifiable under Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR). We assume that fire brigade call-outs requiring attendance but little action cost £1,000 in manpower and resources; those incidents notifiable under RIDDOR cost £10,000 including any damage to the conveying vehicle; and a subsample of 5% of 'RIDDOR incidents' (i.e. a total of five each year) involving escape or combustion of a dangerous goods cost £100,000 in mitigation, vehicle damage, lost product, disruption and environmental damage.
  
6. An estimate of the annual cost in injuries and fatalities, and in damage and remedial action is presented in Table 2. To calculate the cost of injuries, we use Department for Transport's (DfT) valuations based on the willingness to pay to avoid a marginal increase in risk to the public, adjusted by HSE to allow for additional workplace (or carriage) related detriments. We make no explicit correction to this figure to allow for catastrophic incidents resulting in large scale loss of life, although it should be noted that this risk is a large component of the total risk set out in Table 2. The valuations we use are £1.25 million for the prevention of a fatality (in 2003 prices), and £1,500 for injury prevention, this latter figure being a combination of the likelihood of workplace (or carriage) injuries of varying severity and their associated loss of welfare cost<sup>3</sup>.
  
7. The figures above give a total annual cost of £3.8 million, being the maximum quantified cost of all - except the very worst - accidents involving the carriage

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<sup>3</sup> Based on standard unit costs to society from "The costs to Britain of workplace accidents and work-related ill-health in 1995/96" - Davies-Teasdale.

of dangerous goods. Table 2 also displays total recurring costs over ten years, which is approximately £35.6 million. Some areas of the cost (potential benefits if the accidents are prevented) of accidents involving the carriage of dangerous goods remain unquantified. These include loss of cargo, the cost of the potential of widespread damage to the environment, and any damage concerning road or rail infrastructure, although we believe that the most significant areas of cost have been quantified.

8. The safety benefits of ADR/RID will impact on all elements of this loss, although the package of changes out-lined below would only be expected to have a marginal effect. This is discussed in the comparison of costs and benefits section below.

**Table 2: Estimated annual detriment from the carriage of dangerous substances**

	Annual detriment (£)	Present value cost over ten years (£)
Fatalities	£1,937,500	£18,100,000
Injuries	£20,600	£200,000
Emergency call-outs etc	£1,850,000	£17,300,000
<b>TOTAL</b>	<b>£3,808,100</b>	<b>£35,600,000</b>

### **Objectives**

9. The objective is to consolidate existing carriage-related regulations into a single set of Regulations which will list the duties and make a direct reference to ADR/RID for all other information, such as the dangerous goods list and packaging requirements. The Regulations will also bring in those requirements of the Transportable Pressure Equipment Directive which have yet to be implemented.

### **Options considered**

10. There were two possible options. Firstly, to continue with the present system and amend the existing regulations every two years in line with the revisions to ADR/RID. This would be technically complex as there are several sets of regulations and Approved Documents, which might lead to confusion and compromise health and safety. It could also cause difficulty with enforcement.
11. The second option was to have a single set of goal-setting Regulations containing duties that align with, and reference, ADR/RID for technical detail. Where there were differences from ADR/RID (e.g. as a result of a derogation or to carry forward requirements from existing legislation on tanks and transportable pressure receptacles) these provisions would be contained within the Regulations or in Schedules to them. This is the option taken under

these proposals. It was considered that this would aid duty holders in determining what the Regulations require and also improve compliance.

12. Our original intention was to put in place regulations by the end of 2002 that implemented the 2001 European Commission amending Directives, referencing the 2001 texts of the ADR/RID agreements. But because of the complexities involved, we were unable to meet this deadline and with ministerial approval we have rolled together implementation of the 2001 and 2003 amending Directives and are moving directly to referencing the 2003 texts of the agreements.

### **Information sources and background assumptions**

13. Information about the effect of these proposals on industry practice was obtained through informal consultation with industry associations and company representatives. Information about training requirements was obtained from a training provider. This Regulatory Impact Assessment (RIA) also uses estimates of numbers of vehicles and associated costs from previous RIA analysis of ADR/RID changes. Costs and cost savings have been discounted at 3.5% and health and safety benefits at 1.5% in accordance to Treasury guidance. A ten-year appraisal period has been used.

### ***BENEFITS***

#### **Health and safety benefits**

14. A major cost is the increase in shell-thickness for tanks. An industry source has expressed the view that this could bring significant benefit. This source cited several cases of tankers overturning and the shell rupturing. In his view, the loss of payload would have been prevented in some instances for a tank with the increased shell thickness. This could lead to considerable savings in clean up costs and the reduced chance of any safety risk or environmental damage being caused by the escaped substance. It is not possible to quantify the extent to which the increased shell thickness will prevent accidents or limit their consequences. It is therefore not possible to estimate safety benefits in monetary terms.

#### **Other benefits**

15. There were significant operational cost savings relating to the increase in axle weight limits from 38.5 tonnes to 44 tonnes - introduced two years earlier under general GB road traffic legislation. However, as these increase in weight limits are outside the scope of the proposals addressed in this RIA, they cannot be offset against the costs of these proposals.
16. As noted below, HSE's preferred proposals will lead to cost savings through a simplification and rationalisation of some administrative requirements of ADR/RID. For example, being able to use electronic forms of documentation may lead to particular cost savings. There are also likely to be cost savings

from bringing together many of the existing requirements covering the transport of dangerous goods into a single set of regulations. This will simplify the process of familiarisation with the requirements of ADR/RID. It has not been possible to quantify the extent of these cost savings in monetary terms.

## **COSTS**

### **Business sectors affected**

17. Regulations implementing ADR/RID potentially affect all industries involved in the movement of dangerous goods, including suppliers of these goods, those transporting the goods (largely haulage firms) and those receiving goods (consignees). The principal suppliers affected will be chemical and explosive manufacturers and the oil industry. Many wholesale distributors of chemicals who load quantities of dangerous goods above the minimum amounts are also potentially affected by ADR/RID requirements.
18. Costs under various headings are considered below. The headings refer to the generally distinct areas of ADR/RID, namely design and construction, certification and testing, and other operational costs. Costs by business sector are also discussed below.

### **Familiarisation, and changes to the regime**

19. Industry will need to become familiar with the revised requirements. Familiarisation costs are likely to be low as the Regulations will bring together many existing requirements into a single set (at present spread over a number of statutory requirements), as well as bring in the remaining requirements of TPED covering new pressure tanks, pressure drums and bundles of cylinders. Balanced against these small familiarisation costs are several changes to the regime which should simplify and rationalise administrative requirements and lead to cost savings. A few of the other changes are listed below.
20. Introduction of tank codes into RID/ADR will rationalise the tank selection procedure for consignors/operators. The administrative procedure of obtaining a B3 certificate (confirming suitability for purpose) will also be simplified.
21. Electronic methods of providing documentation will now be permitted by RID/ADR providing certain conditions are met.
22. A form will now be included in RID/ADR which can be used as a combined dangerous goods declaration and container packing certificates for multimodal carriage.
23. The packaging requirements in RID/ADR have been made clearer. Some new definitions have been introduced, primarily to clarify a consignee's duties in relation to safety obligations.

## **Alignment with ADR road tank construction requirements and initial certification**

24. From the coming into force date of the Regulations all new gas and non-gas tanks will have to be built to ADR construction requirements whether operating domestically or internationally. This will affect different sectors of the dangerous goods industry in various ways, depending on the type of tank used in the sector and how often these tanks are used for international carriage.
25. The principal issues affecting domestic carriage are a new shell thickness requirement, and also new requirements to do with baffling of tanks of a specified (generally greater) thickness and providing compartments of a specified minimum volume. In addition new gas tanks (etc) fitted with safety valves must now be fitted with a bursting disc placed before the valve, and a pressure gauge (or similar) between the disc and the valve, in order to detect a leak or rupture. Finally, in terms of manufacture, a tank code reference must be inscribed onto the tank itself, or on a plate secured to the tank.

### ***Semi-trailers and rigid petroleum tanks.***

26. We have previously estimated that there are a total of around 11,500 semi-trailers used to carry dangerous goods in the 32.5 tonne plus class. This includes semi-trailers operated by road hauliers and also those owned and operated by the chemical industry. Including some smaller semi-trailers (for which we have less information) this would suggest a GB total of around 15,000 semi-trailers of all sizes. Semi-trailer tanks last typically for fifteen years, so we assume around 1,000 semi-trailer tanks are replaced each year at the present time.
27. The total size of the GB petroleum tanker fleet has been estimated by the UK Petroleum Industry Association (UKPIA) at around 3,500. The vast majority of these vehicles are rigid steel tankers in the 32.5 tonne plus class, and are not currently certified as being to ADR standard. Again, we assume that the tank lasts around fifteen years on average, so that some 230 new tanks are purchased each year.
28. The majority of semi-trailers and petroleum tanks are made of steel (although some semi-trailers are made of aluminum). We have been advised by specialist manufacturers that new rigid tanks able to operate to the maximum weight limits i.e. those fitted with a baffle would require some 500 kg more steel than currently used. This should also be true of semi-trailers, and would lead to an additional material cost of around £1,300.
29. Research has suggested that the additional elements of the initial certification to ADR standard of new tanks will amount to some £1,000. This is lower than an estimate provided by a manufacturer of rigid tanks (see below) but we believe it is reasonable. We have also been advised that the new requirements relating to valves required for gas tanks and the fitting of a metal plate will add a further £150 to costs. The total additional cost of a tank

fully meeting ADR standards as compared to one which does not but which is of the same loaded weight will therefore be around £2,500. This represents some 3-5% of the cost of the new tank.

30. In terms of new tanks purchased each year, this would indicate total costs of  $1,233 * £2,500 = £3$  million (rounded). This is an annual cost, as old tanks are continually replaced by ADR certified tanks. The ten-year cost is £26.5 million in present terms, using standard government discounting procedures.

***Rigid tanks (excluding carriage of petroleum)***

31. In the 1996 RIA when the process of aligning domestic requirements with ADR/RID was started, we estimated that there was a total of around 6,000 non-petroleum rigid tankers in operation in GB, the majority of which carried fuel and gas oil. This was an approximate estimate based on information from industry sources, which we take to be current today. These tankers are mostly operated by specialist industries, for example supplying domestic oil, refueling mobile work machinery or power facilities, or collecting waste. Some of these tanks may not carry goods currently classified as dangerous for carriage, although we believe the majority will be in scope of these proposals, as explored below. Given an average life of 15 years, this indicates that some 400 tanks will be replaced each year under normal replacement schedules.
32. Rigid tankers are usually made of mild steel. As a consequence of this, the industry contends that the move to ADR standards will have a more severe effect than for aluminum tanks. Since these tankers are generally smaller than 38 tonnes (typically 18 to 32 tonnes), the tanks are not weight limited under general GB road traffic legislation.
33. In terms of shell-thickness, industry estimates the ADR specifications will lead to a one-third increase in the amount of steel required for the shell. Industry estimates that this increase in material, together with more stringent testing to ADR certification standards, would lead to an increase of some 10-15% onto the cost of a new steel tank. Tanks come in many sizes and may be top or bottom loading, but the average cost of a new tank at present, given the sizes of tank currently used, would be around £40,000. The increase is therefore equivalent to some £4,000 to £6,000 on the average cost of a tank.
34. This is a considerably higher estimate than the 3-5% we have established for larger tanks. Of the lower estimate of cost, some £2,500 relates to testing, and some £1,500 to materials. The material cost is consistent with estimates supplied by other manufacturers. Testing costs are higher. Initial tests required for ADR certification include radiographic and ultrasound testing (which has to be carried out under controlled conditions) and pressure testing, and these costs will vary depending on the nature of the tank. The £2,500 figure may also not be additional, compared to current testing. Nevertheless, we apply the lower estimate of additional cost to newly purchased tanks used for carriage of dangerous goods.

35. The number of rigid tanks that will now need to satisfy ADR standards will be lower than the total numbers needing to be replaced, for two main reasons. Firstly, it is possible that the costs themselves may result in a greater propensity to re-mount existing tanks. Secondly, some tanks may be dedicated to carrying non-dangerous goods. The effect of remounting, if it is realised in practice, would be to reduce the numbers of new ADR standard tanks being purchased each year, although we cannot take account of this tendency at present.
36. We assume that three-quarters of the 400 tanks replaced each year will be built to ADR standards, suggesting industry costs of  $300 * £4,000 = £1.2$  million. Assuming a constant replacement rate, ten-year costs would be £10.3 million, which we round to £10 million, given the uncertainty in the estimates.

### **Ongoing operating costs associated with ADR certified road tankers**

37. Industry has maintained that the increase in shell-thickness will lead to a capacity loss compared to existing non ADR-certified tankers. However, this has to be interpreted with care. In the short term, increased shell thickness may have some practical effect. However - unless the tank is weight limited in the long run we would not expect any reduction in tank capacity from the increased shell thickness.
38. This is because tanks are available in a range of sizes, and we would expect that the decision over the size of the ADR tank to be purchased in the future would take account of its capacity. The new tank would be more expensive, but we have already accounted for this cost. In the same way that the new general vehicle weight limits make no operational difference for lower than maximum weight tanks, then the capacity change also makes no operational difference.
39. Another way of looking at this issue is to suppose that the new ADR standard tanks were constructed to the same internal capacity as the ones they were replacing, instead of the weight limits. In this case, there is no long term operational cost associated with operating the new tankers, once the initial cost has been taken into account. The only remaining cost is where the trailer has greater wear because of the increased weight at a given capacity. This cost will be relatively small.
40. The exception is where all road vehicles, including tanks, are affected by the axle weight limit under general GB road traffic legislation. This has recently been increased from 38 tonnes to 44 tonnes. Many, though not all, semi-trailers would be affected. Under ADR, the internal capacity of a weight limited tank would be lower than that of a non- ADR tank, since some additional weight would be taken by the tank, rather than the payload. However, the rise in weight limits will have resulted in a significant benefit to all hauliers. Although this change is not attributable to ADR, it has been made to align GB domestic regulations with those in operation in the rest of Europe, the 44 tonne maximum being set by an EU Directive.

41. For new ADR certified semi-trailers and petroleum tanks operating to the new weight limits, the 500 kg of extra steel required would represent an equivalent loss in the total volume of product that could be carried. Industry advisers have estimated that the total operating costs associated with 1 kg of petroleum product works out to be approximately £10 per year. Costs are higher to hauliers carrying different products, and another industry specialist has suggested a figure of £20 per kg per year. Compared to existing tankers under the new general weight limits, the loss in maximum capacity represents a cost to the industry of around £5,000 per year for each petroleum tanker that is affected, and £10,000 for other tanks.
42. If half of all tanks (other than small rigid tanks) are affected in this way - i.e. are in fact weight limited - this would suggest additional *cumulative* costs of:
- $$[233 * £5,000] + [1,000 * £10,000] * \frac{1}{2} = £5.6 \text{ million each year.}$$
43. These costs are cumulative, in the sense that the loss is re-incurred each year, and builds up as tankers are replaced each year with new ones built to ADR standards. The annual loss at the ten year point - relating to all the tanks replaced in the previous nine years - is therefore  $9 * £5.6 \text{ million} = £50 \text{ million}$  (rounded). Total costs over a ten-year period are around £200 million in discounted terms.
44. Both industry specialists and industry manufacturers have highlighted the fact that tank operators will have a strong incentive to re-mount their existing non-ADR certified tanks - especially ones constructed to the new weight limits. This would, of course, limit costs. However, it would also reduce safety benefits. Our cost estimates are based on the premise that there will be no increase in the propensity to re-mount existing tanks.
45. Industry consultants have also pointed to the significant gains that could be made if there is a general move in the direction of aluminum tanks rather than mild steel. As a typical example, an aluminum petroleum tank constructed to new weight limits would be able to carry some 600 kg more product than an equivalent steel tank, a saving equivalent to some £6,000 each year. This saving would offset the losses from greater shell thickness and baffling thickness (or numbers). In absolute terms, it would repay the additional material costs of the tank within a year, and the whole cost of the tank itself within ten years.
46. However, the haulage industry has expressed reluctance to move to using aluminum tanks. This is partly on structural grounds, although new aluminum tanks will be constructed to a greater shell thickness than existing steel tanks. Part of the operational gains will not be realised if the aluminum tanks do in fact have a slightly shorter life, or require greater expenditure to achieve the same life span as a steel tank, however industry advisers suggest this is not necessarily the case. We cannot anticipate any such change in our costings, but would welcome more information.

## **Alignment with ADR/RID and TPED inspection regimes**

47. Currently, the ongoing inspection of existing road and rail tanks is undertaken by a competent person, who specifies conditions and frequency of the testing depending on the type of tank and load carried. Inspections are carried out either by an in-service specialist, or on a 'third party' basis (as with 'ADR/RID inspection', this is again usually done in conjunction with an insurance company). All GB operators of tanks will therefore have to become familiar with the new requirements and consider if there are any implications for their own testing regimes. However, the phasing out of the competent person inspection regime is to be delayed until 1/7/06 to allow duty holders to prepare for the conversion to the regimes required under the directive. This should help limit possible problems of conversion.
48. In order for operators to become familiar with the proposed scheme, we allow a total of 1 day's management time to the estimated 800-1,000 road tanker operators, 130 to 180 tank-container operators and ten rail tanker operators in the industry. This suggests one-off familiarisation costs of around £200,000.
49. Ongoing inspection costs are currently met in full by the tank operators. In most cases under the proposed scheme, the first full inspection of new tanks would be required some five to eight years after initial inspection. There are differing views in the industry over whether compliance with the requirements of ADR/RID will result in a greater frequency of inspection. Views ranged from no increase in frequency, to an increase of double the current amount. We assume a 50% increase in inspection frequency, which would be commensurate with tanks being inspected typically every four years, compared with the current six years.
50. ADR/RID standards may require hydraulic pressure testing ('leakproofness' testing) to be done at more frequent intervals than is currently undertaken by some operators. Currently, leakproofness testing is generally undertaken during the periodic inspection of tanks as deemed necessary by the competent person appointed to carry out inspection. ADR/RID would require this to be "normally" undertaken in the course of inspection. However, alternative methods of inspection may be acceptable under ADR/RID, and industry contacts have noted a general move away from leakproofness testing within the industry. We require more information before estimating the scale of these additional costs, if any are in fact incurred.
51. Manufacturers have advised that the functional full economic costs of an inspection in general will be around £500, including an allowance for lost productivity whilst the tank is off the road. Given a global total of around 20,000 tanks generally dedicated to carrying dangerous goods, this would suggest an additional expenditure of £2.7 million over a ten-year period, or £2.2 million discounted to current values.

## **Tank containers and portable tanks**

52. UN fibre reinforced plastic tank containers have been introduced into ADR/RID. These are not widely used in GB, and industry has confirmed that there will be no cost or benefit considerations at present from this change, although there may well be some benefit from increased flexibility in future.
53. UN portable tanks will now be able to be used for any mode of transport (including sea transport). We have been advised by industry specialists that there are no major implications of this change at present, although there may be a positive benefit from greater flexibility in the future.

## **UN certified multiple-element gas container (MEGC)**

54. Multiple-element gas containers will now come under scope of the regulations. This will mean compliance with the requirement to use a formal approval body scheme for initial and periodic inspections (rather than the existing informal approved person scheme). There will also be additional placarding requirement for MEGCs where there are multiple compartments.
55. According to industry sources there are only two MEGCs being operated by UK companies, both of which are outside the UK. Therefore the costs to Britain of MEGCs coming under scope are likely to be negligible.

## **Minimum Vacuum Rating for Rail Tanks**

56. A new requirement has been added that shells designed to be equipped with vacuum valves shall be able to withstand an external differential pressure of not less than 0.21 bar. For shells not designed with vacuum valves this value shall not be less than 0.4 bar.
57. In Britain tank wagons are designed to be fitted with vacuum valves but are not generally fitted with vacuum support rings. To meet the 0.21 bar vacuum requirements on a typical UK wagon design would need to fit 2 additional internal stiffening rings. Industry estimates that fitting these to a new build wagon would add about £1,000 to the cost of the wagon. The current UK requirement for new tank wagons is estimated at 50 wagons per year. The total policy cost would be approximately £50,000 per year, or £400,000 over the ten-year appraisal period in present value terms. The rings would add about 400Kg to the weight of the wagon, which in many cases would reduce the payload by the same amount. There would be some costs associated with this, but it not possible to accurately estimate them.
58. Although the new transitional measures would permit the continued use of existing tanks and those built before the coming into force date of the Regulations, tank wagons built after this date would need to meet these new requirements unless RID were amended or a derogation sought.

## **Alignment with RID rail tankwagon etc. requirements (other than inspection)**

59. Rail tank wagons have historically been constructed close to RID standards. For example, RID minimum shell thickness requirements are currently met due to the nature of the mode of transport involved. In addition, rail tanks have very long operating lives. Of the 4,166 registered rail tankers in 1996, 1,768 were in long-term storage and none were built during that year. Since it is almost certain that any new build after 1999 would have met RID standards, we do not expect any additional costs to rail tank manufacturers or operators.
60. RID now requires placards at each end as well as both sides of inter modal tanks or containers being transported by rail. Around 5% (at most) of all rail goods movement are thought to involve dangerous goods. This would indicate a total of around 2 million train miles of carriage, representing something in the order of 10,000 train movements involving dangerous goods, assuming an average journey length of 200 miles. If we further assume each tank or container makes 100 journeys per year, this suggests further placarding would be required for around a thousand trains, involving containers carrying dangerous goods of various numbers and types.
61. Actual costs will depend on the number of tanks or containers involved. An upper cost of re-placarding would be around £1,000 for each train. This suggests that one-off costs will be less than £1 million, and recurring costs less than £100,000. Costs could be significantly less, since some train movements will consist of one tank or container. We carry forward a cost of £1 million in present terms into the ten year totals, recognising that this is a very approximate estimate.
62. A new change to RID allows either reflectorised or non-reflectorised plates to be used. This will result in some nominal savings to rail carriers in certain circumstances.

## **Other operational issues**

### ***Intermediate bulk containers (IBCs)***

63. Under ADR/RID, any IBC of more than 450 litres capacity will need to be marked and labeled on two opposite sides. This requirement will affect almost all metal or composite IBCs used for carrying dangerous goods. The industry has previously advised there are around 200,000 composite and metal IBCs in use at any one time. Assuming half are used to carry dangerous goods, and applying a unit cost of £50, this would suggest initial costs of around £5 million, and annual recurring costs of around £500,000 thereafter. Total present value costs over ten years would be around £9 million.

### ***Hazard labels***

64. All hazard labels, whether primary or secondary, will now have to show the class number in the bottom corner. Hazard labels generally have a short life

because of wear and tear. Industry will incur some cost if it has to abandon existing stocks of labels. However there has been an exemption in force since 1.7.01 allowing industry to start using the 'new' subsidiary hazard labels, so presumably not too much old stock will be left. We are therefore expecting any changes to do with existing (rather than additional) labeling to be small.

65. Orientation labels on certain (liquid) packages will now be mandatory. Applying a nominal cost of 60p for two sticky labels to 10% of the total population of IBCs in domestic use (around 15 million) suggests costs of £900,000 million. This cost will be re-incurred on a yearly basis, if the labeling lasts on average for one year. Total costs over ten years would be in the region of £8 million in present terms, although this is a very approximate estimate.

### **UN 1202 (Gas oil, diesel etc) - differences in scope under the international agreements**

66. In line with requirements of ADR/RID, substance UN 1202 will be in scope of dangerous goods legislation at a flashpoint of less than 100°C. Compounds affected include gas oil, diesel fuel and light heating oil. Current domestic legislation aligns with the UN Recommendations which has a flashpoint at less than 61°C.

67. Suppliers of petroleum products are potentially affected by this change. Firstly, oil companies supplying petroleum retailers (either their own or others) will also supply diesel fuel for use in motor vehicles. The UKPIA has advised that in the vast majority of cases, the delivery vehicle will be carrying a mixed load of petroleum and diesel in a tanker already suitable for the lower flashpoint compound. Since there are very few cases where a delivery consisting solely of diesel is made, any additional costs will be very limited.

68. The second area of the industry affected is in the supply of gas oil, fuel oil and heating oil, principally to commercial concerns (for example for use in machinery or electrical generators). This is done by specialist suppliers, predominately using the smaller rigid steel tankers identified above.

### ***Petroleum industry***

69. The UKPIA have expressed an informal view that there are very few existing tanks not constructed to ADR standards. This is because the vast majority of carriers also carry kerosene in the same load as diesel oil, and in any case all tanks are compliant with current regulations to enable the consignment of dangerous substances (the operator would be at a commercial disadvantage if this is not the case). As with petroleum retailers, we are therefore expecting no (or very limited) costs in meeting ADR design requirements.

70. However, suppliers, general freight transporters and the construction (and utility) industry as a whole are likely to be affected by operational changes

(the latter two industries routinely dispense their own diesel fuel for use in road vehicles or construction work equipment).

### ***Road Haulage industry***

71. The Freight Transport Association (FTA) has pointed to two additional operational costs. Drivers would now have to have ADR certificates, and companies would now have to appoint a Dangerous Goods Safety Adviser (DGSA). In addition, the ADR/RID flashpoint for UN 1202 of up to 100°C will mean that more drivers would be required to hold vocational training certificates and more companies will need to appoint DGSAs than currently.
72. The number of road haulage companies is around 20,000. We have previously estimated the number of distributors already involved in the carriage of dangerous goods at around 6,000 (this was considered a high estimate, although a small proportion of these would be principally road tanker operators). The FTA has advised that many (we assume one-third) of the remaining 14,000 companies would now need to employ DGSAs.
73. The RIA for the Dangerous Goods Safety Advisers Directive estimated that the typical cost of employing an outside DGSA would be around £2,000 per year in current prices. However, we would expect costs concerning standard operations with just one substance to be significantly lower, and we use a figure of £800 (broadly representing one day's consultant's time on a yearly basis). This suggests an ongoing annual cost to the road haulage companies of  $14,000 * 1/3 * £800 = £3.7$  million. Total costs over ten years are estimated at £32 million in present values.
74. The FTA highlighted further costs to construction and plant hire companies, which are now examined in more detail. Apart from these costs, some (general) road haulage companies may consign diesel for use by their own vehicles, but we would require more details to estimate costs.

### ***Construction and plant hire industries***

75. The construction industry - including the plant hire industry - has also provided information about costs. Three of the largest GB construction companies were contacted, two of whom are involved in road maintenance operations and other mobile construction sites. These companies reported that they very rarely consigned diesel between sites, although this could happen on some large road projects. Diesel is consigned to the site either by the plant hire company, or (if the plant is owned) by a diesel supplier. The companies reported that only a very few large operators consigned their own diesel. From the information supplied, grossing up the reported number of diesel tanks (the vast majority of which are rigid trailers) owned and used by construction companies gives a GB figure of around 100 tanks.
76. In terms of construction requirements and hazard labeling, costs to these construction companies are subsumed in our overall total of 6,000 rigid tanks estimated in the first section. Simply applying these costs to 100 existing

tanks would suggest an additional recurring cost of around £25,000 as new tanks are replaced to ADR standard, and a further £10,000 for placarding etc. Training costs are discussed below, and would total around £15,000 for drivers of these tanks.

77. The association representing the vast majority of GB plant hire companies expects much more significant costs. The Association reports their membership total of 1,150 plant hire companies represents some 80% of the GB total, suggesting a total industry figure of 1,400. The fuel for the equipment hired out by these companies is generally delivered in small quantities in towed bowsers or portable bundled tanks. It is therefore unlikely that costs relating to these tanks are already covered in our estimates. The vast majority of the diesel transported is outside the scope of current regulations.
78. These tanks will now have to be replaced with ADR compliant tanks, and the drivers trained. The Association reports that most of its members are small and medium size enterprises. For simplicity we assume two tanks per company *on average*, giving a total of around 3,000 small diesel tanks needing replacement. From information already supplied, we would expect the cost of a new small tank to be around £10,000, however the replacement cost will be the loss in value of the existing tank, which we take to be £5,000. This indicates total initial costs of around £30 million, incurred at the time these proposals come into force.
79. Drivers of the vehicles towing these tanks will also need to be trained. Training in the ADR requirements relating to a specific substance (rather than a range of substances) has been examined in previous RIAs, and we have been advised that this should take no longer than one day at a full economic cost (including fees) of around £150. Assuming one driver per vehicle for each trailer (and one tank per trailer) suggests additional training costs of  $3000 * £150 = £450,000$  initially and around £45,000 annually thereafter.
80. In addition, using the estimates above, placarding and other operational costs would total around £500,000 initially. Also from above, the formal appointment and use of Dangerous Goods Safety Advisers would cost each of the 1,400 companies affected some £800 each year, giving a recurring cost of around £1 million. Total present value costs to this industry are therefore estimated at around £41 million over ten years. Please note that these costs are an estimate, and may not account fully for the potential costs within this sector.
81. Finally utility companies (especially electricity companies) undertake the routine refueling of portable generators. Costs on a unit basis will be similar to those incurred by diesel suppliers (if the tank is large) or plant hire companies (if the tank is small). A total of several hundred vehicles used by utility companies for this purpose would suggest additional costs in the order of £5 million to £10 million.

### **Costs to the explosives industry**

82. The requirement for double-manning of explosives vehicles has been removed from ADR/RID. The Committee of Experts removed this requirement as they considered it was no longer justified in the light of other improvements to safety. However GB authorities believe the requirement is still necessary for reasons of national security and will be applying a derogation under article 5.1 of the ADR directive which allows Member States to regulate/prohibit transport for reasons other than safety. Double-manning of explosives vehicles is current practice for domestic transport and retaining the requirement will not impose any additional costs on industry.

83. Several other requirements covering explosives that are out of scope of ADR/RID are being carried forward in these proposals (e.g. carriage by private individuals) or being retained in other explosives legislation (e.g. security labeling). Some of these former requirements have been simplified which may lead to minor benefits to the industry.

### **Incident/accident reporting under RID/ADR**

84. This is a new requirement that will be in addition to, and separate from, the existing system under the RIDDOR Regulations. It will potentially 'catch' everybody involved in transporting dangerous goods. It is difficult to accurately estimate the costs of this requirement, but it is expected that they will be negligible.

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

85. These are widely variable, depending on the nature of the company affected. Unit costs to different types of companies are generally detailed in the text.

### **Total costs to industry**

86. The total policy costs to industry are estimated at £340 million over ten years in present value terms using a discount rate of 3.5%. Of this, £47 million is incurred in the first year after the proposals come into force.

**Table 3 : Total costs to industry (£m)**

Requirement	Annualised cost	Ten year discounted cost
Replacement Tankers		
- Semi Trailers & Petroleum	2.7	27
- Other Rigid tanks	1	10
On-going operational costs	20.3	203

Certification/inspection	0.2	2
Re-placarding rail tanks	0.1	1
Placarding IBCs	0.9	9
Hazard labels	0.8	8
<b><i>Reclassification of diesel and gas oil</i></b>		
- Haulage industry	3.2	32
- Plant Hire industry	4.1	41
- Electricity and utility industry	~0.75	~7.5
<b>TOTAL COST TO INDUSTRY</b>	<b>38</b>	<b>340</b>

### **Impact on small and medium sized businesses**

87. The proposals relating to increased shell thickness of tanks are unlikely to result in any disproportionate impact on SMEs. The increase in the cost of the tank due to the new requirements would typically only be a small proportion of the cost of a new tank. Total costs of the requirement would be directly related to the size of company and the number of tanks affected.

88. The proposals relating to the reclassification of diesel and other fuel oils are likely to result in some disproportionate impact on SMEs. Previous consultation has found that the requirement for around 5,500 haulage and plant hire firms (virtually all of which will be SMEs) to appoint a Dangerous Goods Safety Advisor at a cost of around £800 would impact disproportionately on the smaller firms due to the fixed nature of the cost regardless of firm size. Small firms involved in the hire of industrial plant may also incur disproportionate costs if they were required to purchase a new tank to transport diesel that would only be used occasionally, although HSE believe that this situation would be unlikely.

### **Competition assessment**

89. The haulage and plant hire industries are fragmented, with many small, medium and large firms operating in the market. For the plant hire industry, the nature of the equipment supplied may mean that in some cases there may be less competition in certain products or local geographical markets. The majority of the costs of these proposals are directly related to the size of the firm affected, and would not affect small firms disproportionately. The increased cost of a new ADR compliant tank means that new firms have to incur higher set-up costs that existing firms do not have to meet for a number of years. This is unlikely to affect competition as the increased costs are only a small proportion of the total cost of the tank. Firms purchasing new tanks would also be able to take advantage of the recent increase in weight limits to obtain a tank with increased capacity.

90. The reclassification of diesel oil is unlikely to lead to a sufficient number of plant-hire firms leaving the industry, or ceasing to rent certain types of equipment, to affect competition. Overall a detailed assessment is not thought to be necessary at this stage.

### **Costs to HSE**

91. HSE has incurred costs in developing the regulatory package, although these can be regarded as sunk costs. It is not anticipated that there will be any significant increase in enforcement costs to HSE as a result of the proposals.

### **Other costs**

92. There are no other costs associated with the proposals.

### **Total costs to society**

93. These are the same as the costs to industry.

### **Environmental impacts**

94. The proposals will have a positive environmental impact. Many dangerous goods carried in existing tanks can cause significant environmental damage following a spillage. The increase in tanker shell thickness may in some instances prevent the tanker rupturing and the spillage of the payload.

### **Balance of costs and benefits**

95. The total costs to industry are estimated at £340 million over ten years in present value terms. Of this figure approximately £200 million relates to the ongoing operating costs associated with the small capacity loss compared to existing non-ADR tanks. Whilst this cost cannot reasonably be offset against the operational benefit to industry from the recent increase in the maximum axle weight limit from 38 tonnes to 44 tonnes, it should be remembered that such operational cost savings were significant.

96. The remaining cost of £140 million, can be seen to be significantly higher than the total risk from the transport of dangerous goods estimated at £35.6 million over ten years. The proposals are only likely to result in a small reduction in this total risk figure. The quantified risk figure excludes certain elements of cost relating incidents involving dangerous goods such as loss of payload and possible disruption and environmental damage which in certain cases may be significant. The quantified figure also does not include any benefit that may accrue from the prevention of any very serious but rare accidents involving dangerous goods. Despite these two exclusions total costs will exceed safety benefits. Rationalisation and simplification of the regime will lead to administrative benefits although these are likely to be small in comparison to total costs.

## **Uncertainties**

97. The figures in this RIA are largely based on informal consultation with trade associations and industry specialists therefore are subject to a degree of uncertainty. Uncertainties are as detailed in the text.

## **Consultation**

98. The Consultative Document containing the draft Regulations (CD188) was published on 2 June, annexing a pre-consultation RIA. It was widely targeted with over 1000 copies being immediately distributed to known contacts, a further 4,000 copies were issued by HSE Books and over 3000 pdf copies were requested from the website. The consultation period ended on 2 September. We received 155 responses, reflecting the full range of interest groups involved in the carriage of dangerous goods. The preponderance of replies came from trade associations and businesses of all sizes, with consultants, training providers, government and unions also represented. A summary of the consultation exercise will be posted on HSE's website.

99. As a result of respondents stating that the operational benefits of increasing the axle weight to 44 tonnes was not related to these regulations, references accruing these benefits to these specific regulations have been removed from the "other benefits" sections, and from other parts of the text.

100. A number of respondents mentioned that moving to the ADR/RID regimes for carrying goods in limited quantities, the thresholds for loads and for packaging requirements, could push up their costs. HSE have taken the view, based on a simplistic comparison of the changes, that there will be winners and losers, but that overall there will be a neutral effect. It would be disproportionately resource intensive for HSE to carry out more detailed research on this issue.

101. Some respondents questioned the lack of detail about potential enforcements costs, e.g. familiarisation training for the Police. This was considered, but was discounted as being a very small cost component, again making it disproportionately resource intensive to carry out more detailed work.

## **Arrangements for monitoring and evaluation**

102. On-going monitoring of the impact of these regulations will be performed via a number of existing enforcement and industry liaison bodies.