

report

Regulatory Impact Assessment
UPDATE

Amended Recreational Craft Directive
FINAL DRAFT

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REGULATORY IMPACT ASSESSMENT

Proposal for Directive 2003/44/EC of the European Parliament and of the Council, modifying Directive 94/25/EC on the approximation of the laws, regulations and administrative provisions of the Member States relating to recreational craft.

1. Purpose and intended effect

1.1. Issue and objective

Directive 94/25/EC, containing essential safety requirements for the design and construction of recreational craft, came fully into effect in the United Kingdom on 16 June 1998. The Directive applies to recreational craft measuring between 2.5 and 24 metres in hull length, intended for sports and leisure purposes. On 12 October 2000, the European Commission presented a proposal for an amendment to the Directive, extending the scope to include personal watercraft and adding further essential requirements covering exhaust emissions from propulsion engines and noise emissions from craft. The proposal is that these new requirements will take full effect from January 2005 in the cases of four-stroke petrol engines and diesel engines and from January 2006 in the case of two-stroke engines.

This proposal has since been adopted by the European Council and Parliament as Directive 2003/44/EC. The Regulations that will transpose the Directive into UK law are currently undergoing the consultation process with a view to coming into force on 30th June 2004.

Directive 2003/44/EC will apply to a wide variety of recreational craft, including sail cruisers, motor cruisers, motor boats, canal boats and narrow boats, and personal watercraft (propelled by a water jet pump) that fall within the size range. It will apply whether powered by outboard engines, stern drive engines or inboard engines.

The exhaust emission requirements take the form of limits of acceptable emissions of carbon monoxide, hydrocarbons, nitrogen oxides and (in the case of diesel engines) particulates.

The noise emission requirements are presented in terms of maximum acceptable sound pressure levels determined from a pass-by test. Directive 2003/44/EU also provides for the use of a "Power Displacement Ratio" formula and a "Froude Number" as a method for determining compliance with the directive. Furthermore, it provides for the establishment of a database of reference craft whereby craft will be deemed compliant if key design parameters are the same or compatible with those of a certified Reference Boat.

Directive 2003/44/EC is of the New Approach kind, whereby the technical means of demonstrating compliance with the requirements are given in harmonised standards. The engine manufacturer will be responsible for meeting the exhaust emission requirements and also, in the case of outboard-engined craft, the noise requirements. The craft manufacturer will be responsible for meeting the noise requirements in the cases of craft powered by stern drive and inboard engines.

The objectives of the Directive 2003/44/EC are to remove technical barriers to trade arising out of Member States' differing requirements for exhaust and noise emissions, and to protect the health and well-being of citizens by reducing their overall exposure to pollutants and nuisance arising from recreational craft. Directive 2003/44/EC will apply to craft and propulsion engines coming new on to

the market, and will not apply retrospectively to any craft that has been placed on the market and/or taken into service before the date of introduction.

1.2. Equity and fairness

Directive 2003/44/EC is intended to benefit the general public by contributing in the medium to long term to reduced air and water pollution levels and lower ambient noise levels. All industry within the scope of the Directive will incur compliance costs but equally will have access to the whole of the EU and European Economic Area market without additional technical barriers. However, small businesses will inevitably be penalised by virtue of the small volume of their output over which to offset their costs.

2. Options

Three options have been identified:

2.1. Option 1

Do nothing. Delay transposition of Directive 2003/44/EC until a later date or ignore completely.

2.2. Option 2

Implement Directive 2003/44/EC by transposing into UK law as currently drafted.

2.3. Option 3

Implement Directive 2003/44/EC into UK law, within the agreed timescales, by means of consolidating Regulations i.e. by combining with the Regulations that previously transposed Directive 94/25/EC in order to have one, clear, transparent piece of legislation.

3. Risk assessment by option

3.1. Option 1

Directive 2003/44/EC has been adopted. The deadline by which it should be published by Member States is 30th June 2004. After this time, Member States may be penalised by the European Commission for non-implementation.

If Directive 2003/44 EC were to be ignored or delayed, all potential benefits of the Recreational Craft Directive will be negated. The contribution of recreational craft to national pollution levels arising from exhaust emissions will not decrease in line with the objectives of the directive. Moreover, with the UK boat park increasing, the problem on a national scale could potentially increase if emission regulations are not in force.

Local pollution from exhaust emissions and ambient noise will also not be addressed. Popular boating areas may see a decrease in air quality and an increase in noise pollution.

Without the Directive 2003/44/EC, small to medium sized UK manufacturers may find it difficult to export to Europe. Trade barriers will still exist from EU countries that already have their own regulations in place. Directive 2003/44/EC will eliminate this risk by providing a set of standard regulations applicable to the entire European Union. All craft conforming to the regulations can be exported to any other EU country without barriers.

If Directive 2003/44/EC is not implemented, manufacturers from non-EU countries are free to market products that may be inferior and less environmentally sound within the EU at a reduced cost. This could have a reversal in the desired effect on the environment intended for the directive and could make UK manufacturers less competitive.

3.2. Option 2

If Directive 2003/44/EC is transposed into law in its current format, there may be a risk of confusion and non-compliance from UK manufacturers. There are areas of Directive 2003/44/EC that are ambiguous and open to interpretation.

If there are too many "grey areas", the policing of regulations can prove difficult and it is likely that some companies will fail to comply fully with the regulations either intentionally or unintentionally. There is a risk that some companies may choose to ignore particular aspects of the directive if they feel it is not in their interests and they can escape any action by means of a technicality.

Other risks will be as per Option 3.

3.3. Option 3

Directive 2003/44/EC would be transposed into UK law after consultation and discussion to ensure that ambiguity and "grey areas" are minimal. The consolidated Recreational Craft Regulations, combining the 1996 Statutory Instrument with regulations transposing 2003/44/EC, would it is hoped provide a clearer, transparent piece of legislation. The requirements of the Directive will result in high costs for a significant number of manufacturers. Costs of testing (where applicable) can be high, particularly amongst small / medium sized manufacturers who cannot absorb the charges across a large volume production line.

Costs may also increase for companies that need to redesign products or source alternative components. Businesses in the supply chain that are less able to supply new compliant products will lose sales which may lead to a small number of business and job losses, as detailed in this report.

Manufacturers may be forced to reduce the number of products available, particularly if old designs are no longer compliant to be sold in the UK. This will reduce consumer choice and may push prices up.

It is not yet clear how long it will take for the Reference Boat database to be established to the point where a reasonable proportion of boat designs is covered by the database operated in conjunction with tolerances applied to the salient factors. The industry would accept 50% as a reasonable proportion. The levels of tolerances that may be applied to which factors when a Reference Boat is used as a basis for certification may also need to be incorporated in the 2003/44/EC. Research is currently being carried out on the potential for a "Sound Boat Model". No allowance or flexibility is built into 2003/44/EC if this turns out to be a viable and efficient method of calculating compliance. If it proves to be so then further amendments may have to be considered in the near future.

There is currently no plan within the industry to run any tests on typical inland craft to achieve an understanding of what proportion of existing designs are likely to have a Froude number less than 1.1.

There is currently no industry body actively supporting the interests of the smaller engine suppliers to negotiate with larger base unit manufacturers concerning where responsibilities should lie for testing the emissions of marinised units. Neither is there currently any industry group planning a programme to research the feasibility of an emissions model which would allow projected emissions of a marinised unit to be calculated on the basis of official test data for the base units.

4. Benefits Arising

4.1. Option 1

The large proportion of businesses manufacturing craft and modifying base engines for marine applications would benefit through avoidance of uncertainty and the costs which would be imposed upon them if the Directive were to be transposed into law in its present form (see below for detailed assessment).

Boat users would benefit by not paying higher prices for new craft when the imposed costs are recovered through sales. They would also maintain their current level of choice, with respect to boat type and engine power combinations (which the amendments to the Directive will reduce).

4.2. Option 2

If Directive 2003/44/EC is transposed into law in its current form, the environmental and economic benefits (detailed below) will be realised. However, there is a risk of misinterpretation by manufacturers. There may be fewer benefits to manufacturers, who may be less aware about how the directive affects them.

4.3. Option 3

If Directive 2003/44/EC is transposed into law by the agreed date but with a consolidated text, the benefits as in Option 2 will be realised. The transposition process should be a lot smoother, however, due to the reduction of areas that may be considered ambiguous. It should be clear to all manufacturers what standards are required. There will be less opportunity for organisations to look for loopholes and technicalities that allow them to build products that do not meet the directive specifications. This would speed up environmental advantages and reduce costs associated with policing and prosecuting non-compliant organisations.

4.4. Summary of Options

BENEFITS	RISKS
Option 1 – Do nothing	
<ul style="list-style-type: none"> • Avoid compliance costs • Prices will not be affected • Small businesses remain competitive • Fewer job losses and closures 	<ul style="list-style-type: none"> • Competition from other non-EU states with inferior products at lower prices • Local pollution will remain a problem • No constraints to limit noise pollution • Trade barriers within EU
Option 2 – Implement Directive as currently drafted	
<ul style="list-style-type: none"> • Environmental benefits realised to the extent that manufacturers comply • Encourages free trade within the EU 	<ul style="list-style-type: none"> • Possible misinterpretation by manufacturers leading to non compliance • Not all environmental advantages realised • PLUS: ALL OF THE RISKS BELOW
Option 3 – Implement a consolidated Directive with clear & transparent regulations	
<ul style="list-style-type: none"> • Directive will be without “grey areas” • Smoother transposition • Compliance higher than with option 2 with fewer loopholes to exploit • Environmental benefits realised • Encourages free trade within the EU 	<ul style="list-style-type: none"> • High cost of testing for noise and emissions • Possible price rises • Extra design costs possible • High cost of testing for noise and emissions • Possible price rises • Reference Boat database not fully established which leads to additional costs of testing • Small manufacturers of boats face proportionately higher costs • Small manufacturers of boats forced to offer mainstream designs only (as covered by Reference Boat Database) • Reduced consumer choice with respect to boat designs and engine options • Some small manufacturers of marine engines may be forced out of business • Large manufacturers will enjoy competitive advantage at the expense of smaller counterparts

5. Environmental Benefits

Following consultation (for details, see below) the benefits to be gained are:

5.1. Atmospheric Pollution

The exhaust emission limits proposed are reported by boat builders and engine manufacturers to be lower than the levels of emissions from some but not all types of engine at present in use. In other words, some proportion of the recreational craft at present in use would already satisfy the proposed new emission limits.

However, there are no data by which to evaluate the magnitude of this proportion, since it was not possible to test a sample of craft. Neither, therefore, is it possible to evaluate the extent to which the remainder of existing craft *exceed* the proposed new limits.

The World Health Organisation has published air quality guidelines giving maximum values of pollutants for avoidance of health problems, but it is not possible to relate these directly to the maximum emission levels proposed for boat engines. Estimates do suggest, however, that pollution from recreational craft only represent less than ½ % of all exhaust pollution in the UK.

The International Council of Marine Industries Association (ICOMIA) estimates that, if all existing engines in service were replaced with new compliant units, the total reduction in carbon monoxide and hydrocarbon emissions would be in the region of 120,000 tonnes per year across Europe. This equates to approximately 30,000 tonnes / year in the UK. However, this is a theoretical figure, which does not take into account the extent to which or the speed at which existing engines would be replaced in practice, under the proposed regime.

Relative to pollution levels from other emission sources, those from recreational craft are acknowledged, even by the European Commission in its Explanatory Memorandum to the draft Directive, to be "very small" overall (no more than 0.5% of the total). There might, however, be localised problems in some areas that have a high concentration of recreational craft at certain times of peak activity. This view is borne out by the similarly small size of the market for marine engines, compared with the total market size for engines used in other applications. However, any reduction that can be achieved in chemical pollutants in the atmosphere and water, especially those from internal combustion engines, will be beneficial. Carbon monoxide is readily absorbed into the bloodstream of humans and animals, greatly impairing the release of oxygen, and is toxic. Nitrogen oxides and hydrocarbons combine to form ozone, affecting breathing. Particulates give rise to oily deposits, both in the atmosphere and in water.

From the data available, therefore, it is not possible to estimate the amount of the reduction in pollutants, which the proposed amendment to the Directive would bring about. There would be reductions in the medium to long term, as those existing craft which exceed the new limits are gradually replaced by new ones. This may take 10-20 years, or perhaps longer.

Note that the Directive 2003/44/EC does nothing to hasten the natural process of gradual replacement of the existing boat as there is no retrospective element to the directive.

Directive 2003/44/EC as represented in its previous draft would have actually delayed the replacement of old engines, as boat owners would have been reluctant to pay the high costs associated with testing for noise and emissions that would have been required. That would have *increased* the amount of pollutants emitted by existing craft. The Directive Amendments as currently drafted, however, exclude all refurbishments and restorations of existing craft.

The process would be in step with the overall cleaning of engine emissions which is already happening, but the contribution from recreational craft would be small, even in the long term. It will result in a small reduction in pollution, but only in those areas immediately adjacent to the busiest locations for maritime craft, at the times of peak activity. The potential benefits in this respect are therefore not measurable.

5.2. Noise emissions

The World Health Organisation has published guidelines for community noise. Generally these take the form of recommended average noise levels over periods of time up to 24 hours. For outdoor areas in parkland and conservation areas (where recreational craft are often used) they recommend that "existing quiet outdoor areas should be preserved and the ratio of intruding noise to natural background sound should be kept low".

Following the public inquiry into a speed limit for boats on Lake Windermere, the inspector could draw no specific conclusion about undesirable noise levels. Some types of motor boat, especially those moving at high speed and designed to plane (that is, to lift under hydrodynamic forces) in the water were acknowledged to be excessively noisy. The latest available data (for 1997/98) from the Institution of Environmental Health Officers show that "Commercial and Leisure" noise sources give rise to about 1000 complaints per million of the population, running second to domestic sources, which give rise to about 5000 complaints per million people.

Water authorities and boat users referred to noise problems on inland waterways when boats are stationary and moored, e.g. when an engine is used to run a generator during night hours, but the proposed Directive will be inapplicable in these cases. The potential benefits from the Directive in this respect are therefore again not measurable.

5.3. Commercial Benefits Arising from Harmonised requirements

There are already in existence, in some European countries, regulations which limit exhaust and noise emissions from recreational craft, and more have been proposed. Manufacturers who export believe that there will be some small benefits from uniform design goals across Europe, but they have not been able to quantify these.

It is likely that any commercial benefits arising from harmonising requirements in respect of noise and emissions would be largely negated, if, as UK manufacturers expect, compliance is not as rigorously enforced in certain other European nations as it would be in the UK.

The exhaust emission limits proposed are in line with other European limits due to come into force for internal combustion engines generally by 2004, and with USA limits for recreational craft engines in 2006, towards all of which engine manufacturers are already working.

6. Compliance Costs

6.1. Business sectors affected

The amendment to the Directive would not affect charities and voluntary organisations.

The business sectors affected will be manufacturers and importers of recreational craft and engines, the Standard Industry Codes (SIC) for which are DM 351200, Building and Repair of Pleasure Boats, and DK 291100, Engines and Turbines.

In the United Kingdom there are an estimated 185 boat builders, 2 manufacturers of base engines for marine applications, and 10 companies which modify bought-in base engines for marine use. The overall annual UK production amounts to £490 million and the total number of people employed in the companies concerned is 5,600.

6.2. Market Structure

The following analyses of the UK recreational craft industry have been left unchanged from the initial Impact Assessment published in 2001. No significant changes have occurred which could lead one to revise basic market statistics beyond the normal limits of variance.

UK Boat Park

UK current recreational boat park:

Approximately 1,500,000 craft, of which;

- 15% are motor yachts
- 45% are sail cruisers with motors
- 40% comprising:
 - Dinghies
 - Inland Waterway or
 - Personal Watercraft

(Europe: current boat park in Europe estimated at 3,600,000 recreational craft)

UK Production (Motorised Recreational Craft)

	Number of Firms	Turnover Range (£m)	Total Turnover (£m)	Employees Range	Total Employees
Large Boat Builders - "The Top 6" - Birchwood - Broom - Fairline - Princess Yachts - Sealine - Sunseeker	6	10 to 150	380	80 to 1000	3,400
Small to Medium Boat Builders	180	0.2 to 4	110	1 to 90	2,200
Total Market	185		490		5,600

	Number of different hull/engine design combinations currently (per company)	Total number of different hull/engine design combinations currently	Number of new hull/engine design combinations per year (per company)	Total number of new hull/engine design combinations per year
Large Boat Builders – "The Top 6" - Birchwood - Broom - Fairline - Princess Yachts - Sealine - Sunseeker	50	290	10	60
Small to Medium Boat Builders	11 (at larger end of range)	640	4	570
Total Market		930		630

UK Marine Engine Production

Manufacturers of Marine Engines:

- Perkins
- Lister-Petter

Principal Marinisers:

- Beta Marine
- Calcutt Boats
- Caterpillar
- Cummins
- Kelvin Diesels
- Lancing Marine
- Lis Marine Engineering
- Mermaid Marine Engines
- Sabre

Number of Firms	10
Turnover Range (£m)	0.2 to 20
Total Turnover (£m)	40
Employees Range	6 to 100
Total Employees	500
Number of different hull/engine design combinations currently (per company)	10
Total number of different hull/engine design combinations currently	100
Number of new hull/engine design combinations per year (per company)	3
Total number of new hull/engine design combinations per year	30

6.3. Costs

This section of the Assessment report details the principal elements of costs arising from the implementation of the Directive Amendment as currently drafted.

6.3.1 Engine Suppliers

The sources of costs to engine suppliers remain unchanged by Directive 2003/44/EC. The costs that are likely to be incurred by Engine Suppliers are likely to be significantly higher for base engine manufacturers than for engine marinisers.

The two manufacturers of base engines in the UK both produce diesel engines for craft propelled by inboard units. They face design and development costs for the new or modified engine types which will be needed to replace those within their ranges that do not already comply with the new exhaust emission limits. However, these costs will be spread over their whole production, of which engines for marine applications form only a very small part. The principal costs directly attributable to Directive 2003/44/EC for these companies will arise in the certification of the new or modified engine types and ratings to meet the emission requirements.

The principal sources of cost for companies which "marinise" base engines will relate to testing and certification. They could either out-source this process through suitably equipped commercial test houses, or they could equip themselves with the necessary engine test cells and measuring instrumentation. The latter option is a prohibitively expensive investment; the former would impose a serious ongoing cost burden on these relatively small businesses.

Marinisers of marine engines could minimise costs from compliance if the base engine they are marinising complies with another relevant EC Directive; in this case, that which applies to road going diesel engines. The base engine manufacturer, however, must certify that the engine will be compliant under marine conditions and with the relevant exhaust configuration. If any marine engines meet the requirements of directives 97/68/EC or 88/77/EEC double certification would mean that these engines are exempt.

This certification will be redundant, however, if the mariniser uprates the power of the engine. Any increase in power is deemed to be potentially capable of exceeding emissions limits and testing will therefore be needed. It is estimated that about half of all marinised engines will be uprated in power, usually in the region of 25% to 100%. The majority of these will be by smaller marinisers. Under Directive 2003/44/EC, all these engines will need re-testing before going to market and this could lead to high costs for the smaller marinisers who cannot recover the costs from a parent company or through absorb the costs across a large volume production line.

6.3.2 Boat Builders

A proportion of boat builders will face the costs of noise testing, together with any additional costs for hull re-design, exhaust silencing and engine compartment lagging, to reduce noise levels if necessary.

Noise testing will involve the services of a notified body, the transport of craft to a suitable area of open water, fuel and labour costs to drive the craft, and additional costs if delays are caused in waiting for acceptable wind and wave conditions on the water.

Affected boat builders will also face additional costs of design and administration to check compliance of their craft with engine manufacturers' specifications and to certify their hull/engine combinations.

6.3.3 Assessment by Froude Number

The provisions introduced by Directive 2003/44/EC allow for the use of the "Froude number" of a craft, in combination with its power / displacement ratio as an alternative to sound measurement tests. A craft will be deemed to comply with the requirement if the Froude number is ≤ 1.1 and the power displacement ratio ($P(\text{kW})/D(\text{t})$) is ≤ 40 . The Froude number depends on two variables, the waterline length and the maximum speed of the craft.

The type of craft most likely to be certifiable through the Froude number / Displacement ratio calculation are inland watercraft (canal boats for example) with relatively low-powered engines – typically up to 100hp. Most boat builders do not currently know what the Froude number of their craft are, although this is relatively simple to work out if they know what variables are needed. The best estimate is that half of all smaller boat builders' production will be certifiable by the Froude number / displacement ratio method and will therefore avoid the costs of pass-by noise testing altogether.

6.3.4 The Reference Boat

The provisions introduced by the Directive 2003/44/EC allow for the establishing of a "Reference Boat" system. Were this to prove successful, only boats that did not conform to a standard reference boat as described above would incur direct costs of testing new models. The individual boat builder's costs would then be limited, where a Reference Boat exists, to the relatively minor costs of ensuring and demonstrating equivalence with the Reference Boat and issuing appropriate declarations or certification.

However, the industry doubts whether the Reference Boat system can ever cover more than the most popular designs. These are likely to be the most popular designs for the "top 6" manufacturers who are driving the research programme to create the database - therefore it would largely consist of motor cruisers at the top end of the market in terms of specification, power and price. An optimistic estimate would be that half of new designs would be covered by the Reference Boat system. This takes into account some reduction in potential consumer choice as manufacturers deliberately restrict design choices to avoid the extra costs of a pass-by noise test. For the purpose of estimating the impact costs of the Directive Amendments as they currently stand, the assumption is made, in the absence of any clearer estimate by the industry, that 50% of new craft will be covered by the database. (In practice, the impact cost will probably be reduced by less than 50% through the Reference Boat system in the first few years of operation.)

6.4. The Sound Boat Model

The concept of the Sound Boat Model is being explored at the same time as the Reference Boat database is being developed. If proven to be practicable, this would have the potential to eliminate the requirement for a pass-by test for noise and the attendant costs thereof – for the vast majority of boat designs. Under this scenario, direct costs of implementation would be mostly limited to relatively minor costs of ensuring and demonstrating compliance and issuing appropriate declarations or certification. There is no provision in Directive 2003/44/EC, however, for the implementation for this method as the model is theoretical and unproven.

6.5. Boat Owners

Every year, a substantial proportion of the boat-owning population makes modifications or conversions to their craft. In the region of 5,000 every year have the engines on older or classic craft refurbished.

A similar number, with newer existing craft, replace their engines with new ones (in many cases the original engine has been installed as a refurbished marine or converted road engine).

Original and individual replicas of historical craft designed before 1950 built predominantly with original materials are now excluded from Directive 2003/44/EC. (Under the previous draft, owners who would have wished to refurbish an engine would have been obliged to purchase a new, emission-compliant engine and make major structural alterations as well as conduct a pass-by test). Indeed, any retrospective element of the directive has now been eliminated as craft put onto the market before the date of transposition will be permanently exempt.

This removes a very substantial burden of cost from smaller builders of classic craft and those maintaining the existing boat park. These costs would have had to have been passed on to boat owners. A direct environmental benefit arises from these concessions, also – without them, boat owners would certainly have deferred decisions to refurbish old engines, leading to an increase in particulate emissions from increasingly worn-out units.

6.6. Compliance costs for typical businesses and boat owners

Of the total of 185 boat-building companies, 6 are of substantial size and the remainder are small to medium in size. The engine marinising companies are all SMEs. Considering these three groups separately, their estimated costs (policy and implementation costs) will be as follows:

6.6.1 Large boat builders

The six companies concerned vary in size, with totals employed ranging from 80 to 1000, and annual turnovers from £10 million to £150 million. Each company has around 50 different hull/engine design combinations in current production and produces on average 10 new design combinations each year. The total number of current craft designs and engine variants between all six companies in this group is estimated as 290.

Some have conducted noise trials to gauge their performance against the proposed noise limits and feel reasonably confident that they can meet the limits with little modification to their designs. Their costs will arise mainly from noise tests to certify their craft and an average cost to conduct such a test for each design is estimated to be £3,000.

In the absence of a Reference Boat system, the costs to a typical company in this group would amount to £150,000 in the first year of implementation of Directive 2003/44/EC and £30,000 per year in implementation costs thereafter for testing. It would also cost another £10,000 total per year in implementation costs of additional design and administration work.

The actual costs to the large boat builder would be substantially reduced by the introduction of Reference Boats. It is not yet known how wide a range of Reference Boats can be created and what proportion of possible designs and configurations can be covered. The industry believes that at best, half of the most popular designs would be covered, leaving manufacturers the ongoing costs of running pass-by tests on significant numbers of new designs, on top of what the industry will have invested in a (possibly restrictive) Reference Boat database.

The latest impact assessment survey indicates that the ongoing implementation costs of design and administration will in reality be less than previously indicated – in the region of £5000 each year (previous estimate reduced by 50%).

If it were to prove possible to develop a Sound Boat model can be accepted under the terms of future amendments, the costs to boat builders will be very substantially reduced, to less than 10% of those which would apply without any kind of reference boat system.

6.6.2 Small boat builders

The 180 or so companies in this group have totals employed ranging from 1 to 90, and annual turnovers from £20,000 to £4 million. At the larger end of this range, a typical company has around 11 different hull/engine design combinations in current production and produces on average 4 new designs each year. None have conducted noise trials against the proposed noise limits, but most

are hopeful that they can meet the limits with little modification to their designs. Here, too, their costs will arise mainly from noise tests to certify their craft and at an average cost per test of £3,000.

It is among small and medium-sized boat builders that the concession excluding from the scope of the RCD Amendment craft (mostly inland craft) with a Froude number of 1.1 or smaller will have the greatest effect on reducing the impact on the industry.

No manufacturers surveyed for this Impact Assessment know if any, let alone how many, of the boats in their current ranges would have a Froude number smaller than 1.1.

However, approximately half of small and medium-sized builders manufacture mainly vessels with engines of less than 100HP. Most inland craft below this power rating are likely to fall below the Froude number limit of 1.1. So, for this group, approximately half of all new boats will incur no greater costs than the minimal costs of self-certification to that effect.

In the absence of a Reference Boat system (or an acceptable Sound Boat model), the costs to the typical larger company referred to above in this group would amount to £33,000 in the first year of implementation of the new Directive and £12,000 per year thereafter for testing, plus another £1,500 total per year in implementation costs for additional design work and administration.

A Reference Boat database would reduce the testing costs for the rest of production by up to 50% (possibly optimistic but adopted for the purpose of calculating the impact cost to the industry). A working Sound Boat model would reduce the potential testing costs by up to 90%.

The latest impact assessment survey indicates that the ongoing implementation costs of design and administration will in reality be less than previously indicated – in the region of £1,000 each year (previous estimate reduced by 33%).

6.6.3 Engine Marinising Companies

The 10 companies employ totals from 6 to 100 people, with annual turnovers of £0.2 million to £20 million. Typically they each have 10 different engine designs/power ratings in current production and produce 3 new designs/power ratings each year. Approximately half of these will be updated with respect to power, and will therefore be subject to testing in their marinised form. The average cost to conduct an exhaust emission certification test for each design has been estimated to be £20,000 – but more recently at up to £10,000.

A single company's costs will therefore on average amount to £50,000 in the first year of implementation of the Directive 2003/44/EC and £15,000 per year thereafter. Alternatively, a company could choose to face an estimated capital cost for installation of new engine test cells of between £100,000 and £500,000.

Implementation costs of administration and training will amount to up to £5,000 per annum for each of the two base engine manufacturers and the largest engine marinising company.

The potential costs are likely to be too much for the smaller engine marinising firms to bear and they may not have sufficient influence with the manufacturers of the base units to persuade the latter to provide the necessary testing facilities.

It may not be possible (for reasons of cost) to establish ratings and provide certification for certain low-volume engine applications. Dry exhaust configurations as used on canal boats would be disproportionately affected if the engine mariniser is only able to carry out type tests on engines with more common "wet" exhaust systems.

6.6.4 Boat owners

Boat owners who wish to refurbish their engines will not be required to obtain noise test certificates unless the refurbishment increases the power of the engine by more than 15%. There are, however, some potential problems of interpreting the Directive with respect to refurbished craft – these are discussed in the appendix.

Approximately 5,000 recreational craft undergo refurbishment every year, but there is no evidence to suggest that engine power is increased significantly (more than 15% above their original rating) in anything other than a very few individual cases. Indeed, it is reasonable to suppose that where engines are deliberately or accidentally tuned up by a little more than 15%, neither the owner nor the boat firm responsible is likely to volunteer the craft for a pass-by test.

The increase in purchase price of craft to allow for the additional costs due to Directive 2003/44/EC could be up to £3,000 for a one-off design – but this is likely to affect mostly high-specification, already relatively expensive craft. In general, manufacturers are likely to pass on all policy and implementation costs to customers, spread over all new boat sales.

7. Total costs

7.1. Boat Builders Costs

Costs for Boat builders and engine suppliers are given below using the assumption that the reference system is established before Directive 2003/44/EC takes effect and that it accounts for 50% of all current and new designs.

Parameters are defined thus:

Policy costs =

- the costs of carrying out pass-by noise tests, estimated at £3,000 for each new hull/engine variant or major modification respectively;
- or emissions tests on a marinised engine unit, for engine manufacturers and suppliers – estimated at £10,000 for each new engine/ exhaust configuration;

Implementation costs =

- the administrative, training and personnel costs associated with checking and issuing certification, training etc – estimated at £5,000 per annum for large boat builders and engine marinisers, £1,500 per annum for smaller boat builders

Assumption with respect to the Reference Boat System

For the sake of simplifying the projection of impact cost, it is assumed that enough Reference Boats will have been certified in time for the directive to take effect to account for 50% of all current and new designs. The database of Reference Boats is, in reality, going to take longer to develop and phase into use.

7.2. Boat Owners Costs

Costs for boat owners are taken to be additional purchase costs, being the total of manufacturers' year two policy and implementation costs passed on to their customers, plus year one policy and implementation costs amortised over five years.

The following table summarises the costs associated with compliance with 2003/44/EC:

	2003/44/EC (2003) (RIA October 2003)			Original Commission Proposal (RIA Feb 2001)		
	Policy Costs		Implementation costs	Policy Costs		Implementation costs
	Year 1 (£m)	Year 2 on / year (£m)	Year 1 onwards / year (£m) 2003	Year 1 (£m)	Year 2 on / year (£m)	Year 1 onwards / year (£m) 2001
<i>Large boat builders (x6)</i> Current range: total 290 hull/engine variants	0.4			0.9		
<i>Large Boat Builders (x6)</i> Ongoing production: total 60 new hull/engine variants per year		0.09	0.03		0.2	0.06
<i>Small boat builders (x180)</i> Current range: total 640 hull/engine variants	0.48			1.9		
<i>Small boat builders (x180)</i> Ongoing production: total 570 new hull/engine variants per year		0.43	0.18		1.7	0.27
<i>Engine marinisers (x10)</i> Current range: total 100 engine models	0.50			2.0		
<i>Engine marinisers (x10)</i> Ongoing production: total 30 new models per year		0.15	0.015		0.6	0.06
Supply side Totals	1.38	0.82	0.225	4.8	2.5	0.39
<i>Boat owners</i>	1.4	1.4		90	90	

Please note:

- If **Option 1** ("Do nothing") is implemented, the associated costs will be zero
- Compliance costs will be roughly equivalent under either **Option 2** or **Option 3**

8. Impact on small business

8.1. Small business case study illustrations

From among the companies consulted, three have been selected to illustrate the impact of the new Directive.

8.1.1 Case one – Small / Medium Boat Builder

One company builds 40 boats per year, most of which are cabin cruisers. The effect of Directive 2003/44/EC is relatively small. The company is happy with noise and exhaust emissions limits as long as they are sensible and achievable.

The directive will be good for competition, as there has been tight restriction in countries such as Germany and Switzerland. Any extra costs incurred should be negated by the increased opportunity to trade freely throughout the EU without barrier.

Sound emissions are unlikely to be a major issue for the company as they already do basic sound testing and their customers demand a quiet boat. They are confident that they would pass the test as they are at the moment. They would welcome limits to improve noise pollution on inland waterways, but it is much less of a problem for coastal or offshore boats.

It is essential that the Reference Boat database is comprehensive enough to cover most designs. If a pass by test is needed for their boats, it will have a severe effect from a cost point of view and also in terms of time needed to undertake the tests. Locations for pass by tests in the UK are also a problem. The company is not familiar with the concept of Froude Numbers.

They have seen very little effect on engine prices so far and do not expect there to be any major increases in the future. The main engine manufacturers are constantly improving emissions and noise due to customer demand. They are also very competitive with each other, which keeps prices low.

The directive, however, could have a large effect on small companies, particularly if they concentrate on bespoke designs, which would need a test per model and are less likely to have a boat configuration applicable to a Reference Boat.

8.1.2 Case two – Small Narrowboat & River Cruiser Manufacturer

A company employing 20 people builds 8 boats per year using inboard diesel engines. They are well informed about Directive 2003/44/EC and they predict that enforcement will severely affect the range of designs on offer, and the viability of the organisation. There will be no benefits whatsoever to the company

Engines for some of their models are not likely to be compliant and this is certain to force a discontinuation of these boats. This restriction is likely to wipe out all profit in the short term. They anticipate no more than breaking even, but feel that they should survive.

The company are not familiar with Froude Numbers and their potential effect on the business. They are, however, very familiar with the Reference Boat model, although they are sure that their own craft will not be covered in the database. Sound is less of an issue than exhaust emissions. Simple design modifications can be made at relatively low cost to make the boats quieter.

They feel engine manufacturers will certainly raise prices to cover testing and redesign costs, which will inevitably have to be passed on to the customer. They will have to start using imported Japanese engines, although this is counter productive as performance is less well known, more expensive and it is taking business away from UK manufacturers.

8.1.3 Case three – Engine Mariniser

A company with 30 employees, with a turnover of c. £1 million, builds 110 marinised inboard engine units per year. 75% of production involves the “marinising” of new automotive units supplied by Ford and Toyota, the remainder involves refurbishing old engines.

All are inboard diesel engines, with a power range of 40 –140hp; there are 85 different engines in the range. New designs are added to the range only occasionally.

The company carries out no emissions testing currently and has no intention to do so in the future, despite being aware of the requirements of the forthcoming legislation. The owner intends to “find ways around it” – because the high costs of testing each model for emissions would amount to such a high proportion of turnover that sale prices of the engines would have to rise higher than the market would bear, resulting in a severe loss of sales.

He does not believe that the suppliers of the base units (major auto engine manufacturers) would contribute to the cost of or assist with emissions testing. However, they may agree to issue certificates to the effect that the unit, once fitted with a specified maritime exhaust and cooling system, will comply with the same emission regulations as the road-going unit.

The owner believes that if tested, all the units will pass – as the original auto units are already certified to conform to very stringent emissions limits and the marinised units all have exhaust systems which void at or under the waterline, so the exhaust gases are cleaned by the resultant filtering.

The owner fears that liquidation could be the result unless the products could be sold only into non-EU markets. He also believes that the only the largest engine suppliers could survive under the Amended Directive, if strictly enforced.

8.2. Businesses and jobs at risk

The consultation has established that very few, if any, small and medium boatbuilders would be at risk of closure under the terms of the Directive 2003/44/EC as currently drafted. This contrasts with the position that would have arisen had Directive 2003/44/EC been implemented as previously drafted, where one-fifth of these smaller businesses were at risk.

There is a risk that these firms will lose sales to larger firms and overseas manufacturers through having to pass on the extra costs, with no commercial benefits from harmonisation. Several will not be able to offer customers the same range of choice as they can now. These factors may lead to less investment in new technology, new designs, training and new jobs in the future.

The threat to the viability of the smaller engine marinisers remains, however. We consider it likely that at least one and as many as three of the smaller marinising companies (from a total of about ten) will be forced to reduce capacity considerably or close altogether. Thus, between 25 and 75 jobs could be lost among producers of marine engines.

9. Competition Assessment

The transposition of Directive 2003/44/EC will benefit all companies currently trading or wishing to trade in the EU. At present, certain barriers exist which make it difficult or impossible for UK manufacturers to penetrate other European countries. Countries such as Germany, Switzerland and Sweden currently have their own strict regulations about noise and exhaust emissions. UK manufacturers might not build their craft to the required specification of these countries and as such cannot be sold in that country or be used on their waterways.

The introduction of Directive 2003/44/EC will supersede all of these local regulations so that any craft that meets the required directive standards can be traded freely throughout the European Union without barrier. It is possible that new channels will be established for UK manufacturers to market their products and as such, any costs incurred in meeting the standard should be absorbed within the increased revenue.

The increase in competitiveness will ensure the quality of products on the market is high, and may also benefit the end user through more competitive pricing.

Directive 2003/EC/44 is likely to have an anti-competitive effect in the marine engine supply industry. Small engine manufacturers are more likely to uprate the power of new marinised engines to the point where these units are deemed to require separate emissions tests. They also have far less strong relationships with the base engine manufacturers and therefore less access to the latter's testing facilities.

The smaller engine marinisers, therefore, will be placed at a competitive disadvantage compared with the larger organisations in the sector. Business closures and a concentration of the market are likely to result.

10. Enforcement, Sanctions, Monitoring and Review

As with the 1996 Recreational Craft Regulations, the Regulations transposing Directive 2003/44/EC will be enforced by Trading Standards Departments (TSDs) of local authorities in Great Britain and their equivalent in Northern Ireland. They will apply the principles of good enforcement set out in the Cabinet Office's Enforcement Concordat. It is foreseen that enforcement will, primarily, be reactive by following up complaints from competitors and consumers; however, it is also envisaged that TSDs will be proactive if they come across any infringement of the proposed Regulations in the course of their work. Enforcement authorities are required to notify the Secretary of State of any action taken to prohibit or restrict the supply or putting into service of products because of any such infringement, and the reasons for that action.

The implementing Regulations, in line with other similar legislation and the 1996 Regulations, will provide for fines of up to a maximum of £5000 and/or three months imprisonment.

The implementing Regulations will be monitored and reviewed in accordance with normal procedures – a review is likely once the implementing Regulations have been in force for 2-3 years.

11. Other Salient Findings of the Consultation

Given the amount of discussion in the industry and publicity on the issue from the British Marine Federation (BMF), there is a surprisingly low level of awareness of the content and the implications of Directive 2003/44/EC among small and medium boat builders. Only 59% are at least vaguely familiar with the requirements.

The fact that engine suppliers may not be able to cover every permutation of exhaust type and engine they currently supply is thought by one in five builders of sub-100hp craft to be likely to severely limit the range of design options they could offer the market. Approximately one third of all small and medium builders expect their ranges to be at least somewhat compromised.

The response of 80% of boat builders, faced with a reduction in the range of engine / exhaust configurations from their current engine suppliers, would be to switch supplier. This would favour larger engine suppliers (who are more likely to secure support from the manufacturers of the original base engines), which in turn supports our view that smaller marinisers face a considerable commercial risk.

75% of small and medium builders expect extra costs arising from having to implement changes to their range and from higher prices paid to the fewer engine manufacturers able to supply particular units.

82% of small and medium builders have not heard of the Froude number and can therefore not comment on whether their craft will be certifiable through the use of that variable. This raises an education issue for the industry (again, given the publicity on this issue promoted by the BMF, the low level of understanding is surprising).

Similarly, 56% of small and medium builders are not familiar with the concept of the Reference Boat. Of the rest, one-third believe that none of their boats would be covered by the Reference Boat database (53% believe that at best, only a few will be covered). This supports the view, strongly endorsed by the BMF, that the preferred route should be the Sound Boat model.

One in seven small and medium builders believe that some of their boats would have a Froude number greater than the maximum allowed and also would not conform to any Reference Boats. Thus, they expect to be faced with the costs of pass-by tests.

All boat builders surveyed underestimated the costs of conducting a pass-by test, believing it to be between £500 and £1,000, when the real cost is in the region of £3,000.

Faced with conducting a noise test (at the unrealistically low, expected cost), 21% of small and medium builders would discontinue the affected line (or desist from producing a proposed one). 47% believe they would be able to avoid the test by changing the engine size and type – although this is unlikely to work, as other factors are actually more important in generating a higher or lower level of noise produced by a boat. 12% say that they would “continue as they are”, that is, effectively ignore the directive in that situation.

The real effect of these attitudes would be to limit the designs of new models to ensure as little original testing as possible is needed (except in the case of the largest 4 or 5 builders). There are likely to be fewer new models, less choice for consumers, fewer niche manufacturers.

Only 6% of small and medium builders expect to see any benefits at all from a more open, homogenous market in Europe; one in five believe they may lose sales to foreign EU competitors.

Overall, 25% expect no or very little effect on their businesses; the rest expect widely varying degrees of adverse effect. 10% claim they would consider getting out of the affected parts of the boat building business altogether.

Engine marinisers appear mostly to be unaware of what their obligations will be under the Directive 2003/44/EC and what the risks are to their businesses. They tend to believe, probably erroneously, that the suppliers of the base engine units will provide the necessary certification, not understanding that emissions testing is required on the final (that is, the marinised) unit and that it will be their own responsibility.

Engine Marinisers are a small group, falling between the marine sector and the automotive manufacturing sector; as a result, they have not formed an alliance and no trade association or industry body appears to be actively campaigning on their behalf.

12. Consultation

This consultation consisted of 12 personal interviews with:

- 3 large boat builders
 - 3 medium-sized builders
 - 2 companies which modify base engines for marine applications
 - The British Marine Federation
 - The Inland Waterways Association and Inland Waterways International
 - The Environment Agency
 - The National Boat Owners Association
- Telephone interviews were conducted with a further 36 small and medium boat builders
 - Information on environmental effects was carried over from the consultation exercise conducted in 2001

13. Summary of Opinion

The larger boat builders, who export to Europe, welcome harmonisation of requirements, in theory. They claim already to be designing to the most stringent of the localised requirements already in place around Europe. However, they believe that certain countries will not enforce the requirements of the Amended Directive with the same rigour as will the UK; thus, they believe that a level playing field will not be achieved in reality.

Some of the smaller boat builders are still strongly opposed to the changes. They fear the consequences to their businesses of the extra workload and costs, for little, if any, benefit to their customers or the environment.

Manufacturers remain critical of a testing procedure that requires a craft to be transported long distances to open water where the stipulated environmental conditions are unlikely to exist on more than a few occasions each year.

The BMF is working with leading boat builders to set up a reference database of noise-tested craft. However, they believe that it will have severe limitations in practice. The problem is that there are very many permutations of hull design and engine size / type; a database is likely to cover a relatively small proportion of these – half at best. They welcome the use of the Froude number with the power displacement ratio to identify which boats should and should not be required to undergo noise tests. However, it is not clear what proportion of current and future models are likely to be certifiable by this route.

The BMF is also currently researching the Sound Boat model; this is thought to be the most practical solution and one that is equally fair to all sizes of manufacturer, as its potential application is far wider than the Reference Boat system. The model, however, is still in the research stage and there is no guarantee that it will be practicable.

Under Directive 2003/44/EC, engine marinisers will still face very high costs associated with testing engines for CO, HCs and NOx. These costs are sufficiently high to force some to cease supplying engines to the UK / Euro recreational craft market. They do not expect to receive practical help from the manufacturers of the base engines. The Directive does allow reference to the base engine manufacturers' own test certificates of compliance (under very strict emissions standards) for the road-going versions of the engines also supplied for marine conversion. However, this will not be applicable to the 50% of engines (approximately) that are uprated with respect to the power as part of the marinising process.

In summary, it has still not been established in any way that any significant environmental benefits will result from implementing Directive 2003/44/EC as drafted. Further, it is still a crude instrument, which will particularly penalise the suppliers of marinised engines. It will reduce consumer choice, albeit to a limited extent.

14. Appendix

14.1. Issues to be considered for further study

1. The Reference Boat database is currently under development and has the potential to cover approximately half of all new models of recreational craft. However, it will take several years to build a database of certified reference boats to get to that point. The assumption made for the calculations of impact costs will in reality not reflect the true situation in the meantime. It may be necessary to revisit the market in two to three years time, to assess whether the Reference Boat database is having the effects predicted across the industry. It would be advisable at the same time to check that smaller boat builders, too, have benefited from the reference boat database (which the larger manufacturers have effective control of).
2. The impact assessment indicates that the Froude number calculation will exempt the majority of inland watercraft from the requirement for a pass by test. This should also be the subject of a retrospective assessment in two to three years time, to find out whether these expectations bear out in practice.
3. Research is currently underway to explore the potential for a "Sound Boat Model", which could create "virtual" reference boats. This would speed up the process of creating a Reference Boat database. At a later date, it may be advisable – depending on the progress of the Sound Boat research – to re-assess its potential impact. This with a view to supporting any proposals for future amendments of the directive.

14.2. Interpretation of Directive with respect to refurbished craft

While the directive will not be applied retrospectively to the existing boat-park, care needs to be taken with the interpretation as it relates to refurbished craft. It is not clear whether Directive 2003/44/EC would require a refurbished vessel with an increased power rating of more than 15% but still a Froude number of less than 1.1 to undergo a pass-by noise test.

Directive 2003/44/EC is not clear whether a craft with a *replacement* engine (new or refurbished) will be considered a "major modification", or whether it should be treated as a refurbished craft with the same stipulations about increased power ratings and Froude number. The former would be the worst case scenario, in terms of costs that would be borne by boat owners – in that case, up to (approximately) 5,000 owners of existing craft each year would be required to obtain noise test certificates, at a cost of up to £3,000 each.

However, the effect of the requirement would be ameliorated were either the Reference Boat system or the Sound Boat model established and applicable in the case of a conversion, refurbishment or engine replacement.

Clearly, the natural reaction of boat owners faced with this level of cost would be to defer replacing an old engine if at all possible. It is highly likely that older, inefficient and "dirty" engines would continue in service for a longer time than if the amended Directive were not enforced. The net effect may be an *increase* in airborne pollutants from recreational craft until older craft in the current boat-park were forced to be scrapped through extreme age and were replaced by new boats. It is also highly likely that the Directive would simply be ignored in many cases. Not only are the requirements of Directive 2003/44/EC vague on a number of points; but also, many individual boat owners would avoid them one way or another.

15. Declaration

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

Signed.....

Date

Ministers name, title, department

Contact Point

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