Maritime and Coastguard Agency

MERCHANT SHIPPING NOTICE

MSN 1665 (M)

The Merchant Shipping (Fire Protection) Regulations 1998: Fire fighting equipment

Notice to Shipowners, Shipbuilders, Masters, Certifying Authorities and Surveyors

Summary

This Notice advises all Shipowners, Shipbuilders, Masters, Certifying Authorities and Surveyors of the new 1998 Fire Protection Regulations for fire fighting equipment.

Key Points:-

… This Notice forms an integral part of the Merchant Shipping (Fire Protection: Large Ships) Regulations 1998 and the Merchant Shipping (Fire Protection: Small Ships) Regulations 1998.

… Schedules contained in this Notice are invoked by those Regulations and are therefore a statutory obligation.

LIST OF SCHEDULES

In this Merchant Shipping Notice:-

(1) references to regulations in the Schedules, unless otherwise stated, refer to regulations in the Merchant Shipping (Fire Protection: Large Ships) Regulations 1998;

(2) a reference to a numbered paragraph is, unless otherwise stated, a reference to the paragraph of that number in that Schedule;

(3) a reference to a numbered Schedule is, unless otherwise stated, a reference to the Schedule of that number in this Merchant Shipping Notice.

regulation 13 and 26

SCHEDULE 1

INTERNATIONAL SHORE CONNECTION

1. The international shore connection shall be in accordance with the following specification -

Details of flange	
Outside diameter:	178 millimetres
Inner diameter:	64 millimetres
Bolt circle diameter:	132 millimetres
Holes:	4 holes of 19 millimetres in diameter equidistantly placed, slotted to the flange periphery
Flange thickness:	14.5 millimetres minimum
Bolts:	4 each of 16 millimetres diameter; 50 millimetres in length with washers
Flange surface flat face	
Material:	any suited to 1 MPa service
Gasket:	any suited to 1 MPa service

2. The connection shall be constructed of material suitable for 1 MPa service. The flange shall have a flat face on one side, and to the other there shall be permanently attached a coupling which will fit the ship's hydrants and hose. The connection shall be kept aboard the ship together with its gasket, bolts and washers.

regulation 44(1)

SCHEDULE 2

NON-PORTABLE FOAM FIRE EXTINGUISHERS

1. Every foam fire extinguisher, other than a portable fire extinguisher, shall be constructed of suitable materials and shall be of an efficient design and of sufficient strength to withstand with an adequate factor of safety the maximum internal pressure to which it may be subjected and shall be capable of withstanding a test by hydraulic pressure suitably in excess of the maximum working pressure. The maximum working pressure shall be the equilibrium pressure that develops within the body at 70°C when the correctly charged extinguisher has been operated with all outlets closed.

2. Where the extinguisher is provided with a gas cylinder as the means for expelling the extinguishing medium, such gas cylinder shall be constructed in accordance with British Standards Institution Specification Number BS 5045: Part 1: 1982.

3. The extinguisher shall be provided with a nozzle and a reinforced discharge hose constructed to withstand four times the maximum working pressure specified in paragraph 1.

4. Where the extinguisher is provided with an inner container this container shall be adequately supported.

5. Any openings in the extinguisher body shall be fitted with caps or covers so designed that any pressure remaining in the container may be released gradually before the cap or cover can be removed completely.

6. Every part of the extinguisher shall, where necessary, be protected against corrosion.

7. The extinguisher shall be provided with a controllable device to enable the discharge to be interrupted and a means to prevent the loss of liquid when the extinguisher is standing.

8. The extinguisher actuating mechanism shall be protected so that it is safeguarded against inadvertent operation.

9. The design shall permit the ready availability of the extinguisher to be verified and ensure that it will be apparent whether or not the extinguisher has been operated.

10. A fully charged extinguisher shall when operated under normal. conditions be capable of projecting foam a distance of 14 metres for a period of not less than 90 seconds in the case of an extinguisher of 135 litres capacity and over, and a distance of 10 metres for a period of not less than 60 seconds in the case of an extinguisher of 45 litres or over but under 135 litres capacity.

11. The outside of the extinguisher body shall be clearly marked in accordance with the relevant parts of Section 5 of the British Standards Institution specification number BS 5423:1987.

12. The extinguisher shall have the correct filling level clearly indicated.

regulation 44(1)

SCHEDULE 3

NON-PORTABLE CARBON DIOXIDE FIRE EXTINGUISHERS

1. Every carbon dioxide fire extinguisher, other than a portable fire extinguisher, shall be provided with cylinders constructed in accordance with British Standards Institution Specification Number BS 5396:1976 or equivalent.

2. Each cylinder shall be provided with an internal. discharge tube and a valve to release the gas.

3. The extinguisher shall be provided with a discharge hose which shall be reinforced so as to withstand a pressure of at least 12.2 MPa when the necessary couplings are fitted. The bore of the discharge hose shall not be less than the size respectively set forth in the following table -

Capacity of Extinguisher	*Minimum bore of discharge hose*
16 kilogrammes	10 millimetres
45 kil.ogrammes	12 millimetres

The discharge hose shall be provided with a horn which shall be of electrically non-conducting material and of a design which will reduce the velocity of the gas discharged. The metal part of the operating handle shall be suitably sheathed to protect the hands of the operator from extreme cold.

4. At any temperature between 15°C and 18°C inclusive, the extinguisher shall discharge gas at such a rate that carbon dioxide equal. in weight to 75 per cent of the capacity of the container will be discharged in the periods respectively set forth in the following table -

Capacity of Extinguisher	*Period*
16 kilogrammes	30 to 45 seconds
45 kil.ogrammes	60 to 90 seconds

5. The outside of the extinguisher shall be clearly marked in accordance with section 7 of the British Standards Institution Specification Number BS 5423: 1987.

regulation 44(1)

SCHEDULE 4

NON-PORTABLE DRY POWDER FIRE EXTINGUISHERS

1. Every dry powder fire extinguisher, other than a portable fire extinguisher, shall be constructed of suitable materials and shall be of an efficient design and of sufficient strength to withstand, with an adequate factor of safety, the maximum internal pressure to which it may be subjected and shall be capable of withstanding a test by hydraulic pressure suitably in excess of the maximum working pressure. The maximum working pressure shall be the equilibrium pressure that develops within the body at 70°C when the correctly charged extinguisher has been operated with all outlets closed.

2. Where the extinguisher is provided with a gas cylinder as the means for expelling the extinguishing medium, such gas cylinder shall be constructed in accordance with British Standards Institution Specification Number BS 5045: Part 1: 1982.

3. The extinguisher shall be provided with a nozzle and a reinforced discharge hose constructed to withstand four times the maximum working pressure specified in paragraph 1.

4. Any openings in the extinguisher body shall be fitted with caps or covers so designed that any pressure remaining in the container may be released gradually before the cap or cover can be removed completely.

5. Every part of the extinguisher shall, where necessary, be protected against corrosion.

6. The extinguisher shall be effectively sealed to prevent the ingress of moisture, but such sealing arrangements shall not interfere with the discharge of the extinguisher.

7. The extinguisher shall be provided with a controllable device to enable the discharge to be interrupted.

8. The extinguisher actuating mechanism shall be protected so that it is safeguarded against inadvertent operation.

9. The design shall permit the ready availability of the extinguisher to be verified and ensure that it will be apparent whether or not the extinguisher has been operated.

10. A fully charged extinguisher shall when operated under normal conditions, be capable of projecting not less than 85 per cent of the mass of the dry powder charge. The discharge rate shall be not less than 1 kilogramme per second.

11. The outside of the extinguisher body shall be clearly marked in accordance with the relevant parts of Section 5 of the British Standards Institution Specification Number BS 5423:1980.

regulations 12(1)(b); 25(5); 34; 46(1)(a);
Small ship regulations 37(1)(a)

SCHEDULE 5

BREATHING APPARATUS

Smoke helmet and smoke mask type breathing apparatus

1. Every smoke helmet or smoke mask shall be provided with a hose for the supply of air from the outside atmosphere. An air pump or bellows shall be provided which shall be suitable for pumping air through the hose.

The hose shall be of the non-collapsing type and shall be sufficient in length to enable the air pump or bellows to be on the open deck in clean air well clear of any hatch or doorway while the wearer of the helmet or mask is in any part of the accommodation, service, cargo or machinery spaces. Efficient couplings shall be provided if two or more lengths of hose are to be joined in order to reach such spaces. The air inlet to the pump or bellows shall be so protected as to ensure that the supply of air cannot be obstructed.

Self-contained breathing apparatus

2. (a) Every self-contained breathing apparatus shall be of the open circuit compressed air type and shall be of a type which has a Certificate of Assurance issued by the Health and Safety Executive in compliance with the requirements of the Joint Testing Memorandum of the Health and Safety Executive, the Department of Environment, Transport & Regions and the Home Department.

(b) Provision may be made to enable an alternative means of air supply to be connected to the apparatus.

(c) Every self-contained breathing apparatus shall be provided with not more than one face mask unless the apparatus has been certified by the Health and Safety Executive for use with a second face mask which may be used in extreme emergency.

(d) The storage capacity of the compressed air cylinder or cylinders attached to the apparatus and carried by the wearer shall be at least 1,200 litres of fresh air. The storage cylinders shall be constructed of suitable material and shall be of efficient design and of sufficient strength to withstand with an adequate factor of safety, the internal air pressure to which they may be subjected, and each cylinder shall be capable of withstanding a test by hydraulic pressure suitably in excess of the maximum working pressure.

(e) Means shall be provided for the automatic regulation of the air supply to the wearer of the apparatus in accordance with his breathing requirements when he is breathing any volume of free air of up to 85 litres per minute at any time when the pressure in the supply cylinder or cylinders is above 1.05 MPa. Means shall be provided for overriding the automatic air supply to increase the volume of air available to the wearer if required.

(f) A pressure gauge with an anti-bursting orifice shall be incorporated in the high-pressure air supply system to enable the wearer to read directly and easily the pressure of air in the supply cylinder or cylinders.

(g) The maximum weight of any such apparatus shall not exceed 16 kilogrammes, excluding any lifeline and, if they do not form an integral. part of the apparatus, any safety belt or harness.

(h) Every self-contained breathing apparatus shall be provided with fully charged spare cylinders having a spare storage capacity of at least 2,400 litres of free air except that

(i) if the ship is carrying five sets or more of such apparatus the total spare storage capacity of free air shall not be required to exceed 9,600 litres; or

(ii) if the ship is equipped with means for re-charging the air cylinders to full pressure with air, free from contamination, the spare storage capacity of the fully charged spare cylinders of each such apparatus shall be of at least 1,200 litres of free air, and the total spare storage capacity of free air provided in the ship shall not be required to exceed 4,800 litres.

(i) A servicing and instruction manual shall be kept with each such apparatus.

General

3. (a) Every breathing apparatus shall be constructed of materials having adequate mechanical strength, durability and resistance to deterioration by heat or by contact with water and such materials shall be resistant to fire and shall not allow the breathing circuit to be penetrated by smoke or chemical fumes likely to be encountered in service. The fabric used in the construction of any harness provided with such apparatus shall be resistant to shrinkage. Exposed metal parts of the apparatus, harness and fittings shall be of materials so far as practicable resistant to frictional sparking.

(b) The following equipment shall be provided for use with each set of breathing apparatus:

(i) a fire-proof life-and-signalling-line at least 3 metres longer than is required to reach from the open deck in clean air well clear of any hatch or doorway to any part of the accommodation, service, cargo or machinery spaces. The line shall be made of copper or galvanised steel wire rope having a breaking strength of at least 500 kilogrammes and shall be overlaid up to at least 32 millimetres in circumference by hemp or other covering to provide a surface which can be firmly gripped when wet;

(ii) an adjustable safety belt or harness to which such line shall be capable of being securely attached and detached by the wearer by means of a snap-hook;

(iii) means for protecting the eyes and face of the wearer against smoke; and

(iv) plates of suitable non-flammable material bearing a clearly legible code of signals to be used between the wearer and his attendant, one of which shall be attached to the safety belt or harness and another attached to the free end of the life-line;

(c) Every breathing apparatus shall be clearly marked with the name of the maker or vendor and the year of manufacture. Operating instructions in clear and permanent lettering shall be affixed to such apparatus.

regulations 4(4)(b); 7(3)(b); 7(4)(b); 17(2)(b); 20(2)(b); 20(3)(b)

SCHEDULE 6

PORTABLE FOAM APPLICATOR UNITS

1. Every portable foam applicator unit shall be provided with

(a) an induction type of air-foam nozzle capable of being connected to the fire main by means of a fire hose;

(b) a portable tank containing at least 20 litres of foam concentrate from which the nozzle specified at subparagraph (a) can induce the contents;

(c) a spare tank identical to that specified at subparagraph (b).

2. The nozzle whilst being supplied at the minimum hydrant pressure on the ship required by the Regulations shall be capable of producing effective foam suitable for extinguishing an oil fire at the rate of at least 1.5 cubic metres per minute.

3. The ratio of the volume of foam produced to the volume of foam solution shall not exceed 12 to 1.

SCHEDULE 7

FIRE PUMPS AND FIRE MAIN

Fire Pumps

1. Every fire pump required to be operated by power shall, except as expressly provided otherwise, be operated by means other than the ship's main engines. Fire pumps may be sanitary, ballast, bilge or general service pumps provided that they are not normally used for pumping oil and, if they are subject to occasional duty for the transfer or pumping of oil, suitable change-over arrangements are fitted and operating instructions are conspicuously displayed at the change-over position.

2. In any ship in which automatic and remote control systems have been provided in the machinery space in lieu of continuous manning of the space, arrangements shall be made to ensure immediate availability of a water supply from the fire main at the required pressure either by permanent pressurisation or by suitably placed remote starting of the fire pumps. The Secretary of State may waive this requirement for ships other than passenger ships of less than 1,600 tons if the arrangement of the machinery space access makes it unnecessary.

3. In every ship, other than a passenger ship, fire pumps operated by power, (other than any emergency fire pump) shall together be capable of delivering for fire fighting purposes a quantity of water, under the conditions and at the pressure specified in the Regulations and this Schedule, which shall not be less than the quantity obtained from the following formula

Quantity of water in cubic metres per hour = Cd^2 where:

C = 5 for ships required to be provided with more than one fire pump (excluding any emergency fire pump) and C = 2.5 for ships required to be provided with only one fire pump, and

$d = 1 + 0.066 \sqrt{(L(B+D))}$ to the nearest 0.25

where

L = length of the ship in metres on the summer load water line from the foreside of the stern to the afterside of the rudder post. Where there is no rudder post, the length is measured from the foreside of the stern to the axis of the rudder stock. For ships with cruiser stems, the length shall be taken as 96 per cent of the total length on the designed summer load water line or as the length from the foreside of the stern to the axis of the rudder stock if that be the greater;

B = greatest moulded breadth of the ship in metres; and

D = moulded depth of the ship in metres measured to the bulkhead deck amidships;

provided that in any such ship the total capacity of the fire pumps for fire fighting purposes shall not be required to exceed 180 cubic metres per hour.

4. Every fire pump which is operated by power (other than any emergency pump) shall be capable of producing from any fire hydrant or hydrants in the ship, at least the minimum number of jets of water required by the Regulations appropriate to the class and tonnage of the ship, while maintaining the pressure required by paragraph 9.

5. Relief valves shall be provided in conjunction with all fire pumps if the pumps are capable of developing a pressure exceeding the design pressure of the fire main, water service pipes, hydrants and hoses. Such valves shall be so pl.aced and adjusted as to prevent excessive pressure in any part of the fire main system.

6. Every centrifugal pump which is connected to the fire main shall be fitted with a non-return valve.

Location and arrangement of water pumps for other fire extinguishing systems

Additional requirements for ships constructed on or after 1st September 1984

7. Pumps required for the provision of water for other fire extinguishing systems, their sources of power and their control.s shall be installed outside the space or spaces protected by such systems and shall be so arranged that a fire in the space or spaces protected will not put any such system out of action.

Emergency Fire Pumps

Additional requirements for ships constructed on or after 1st September 1984

8. For every ship of 2,000 tons or over, other than a passenger ship, the arrangements of the emergency fire pump shall be such that -

(a) the capacity of the emergency fire pump shall not be less than 40 per cent of the total capacity of the fire pumps required by this Schedule and regulations 30 and 38, and in any case not less than 25 cubic metres per hour;

(b) when the emergency fire pump is delivering the quantity of water required by subparagraph (a), the pressure at any hydrant shall not be less than the pressure specified in paragraph 9(c)(i) or (ii), as the case may be;

(c) any diesel driven power source for the emergency fire pump shall be capable of being readily started in its cold condition down to a temperature of 0°C by hand cranking. Where lower temperatures are likely to be encountered, satisfactory heating arrangements shall be provided. Where hand cranking is impractical alternative arrangements other than by hand shall be such as to enable the diesel driven power source to be started at least 6 times within a period of 30 minutes, and at least twice within the first 10 minutes;

(d) any service fuel tank for the diesel driven power source referred to in subparagraph (c) shall contain sufficient fuel to enable the emergency fire pump to run on full load for at least three hours and sufficient reserve of fuel shall be available outside the main machinery space to enable such pump to be run on full load for an additional 15 hours;

(e) ***if the ship was constructed before 1st February 1992***, the total suction head of the emergency fire pump shall not exceed 4.5 metres under all conditions of list and trim likely to be encountered in service and the suction piping shall be designed to minimise suction losses. ***If the ship is constructed on or after 1st February 1992***, the total suction head and the net positive suction head of the emergency fire pump shall be such that the requirements of regulation 16(3)(a) and 16(4)(d) and of subparagraph (a) shall be obtained under all conditions of list, trim, roll and pitch likely to be encountered in service;

(f) the boundaries of the space containing the emergency fire pump shall be insulated to a standard of structural fire protection equivalent to that required for a control station in Schedule 1 or 2 in Merchant Shipping Notice MSN 1668 (M) as the case may be In the case of a ***ship constructed on or after 1st October 1994***, the space containing the fire pump shall not be contiguous to the boundaries of machinery spaces of category A, or those spaces containing main fire pumps. Where this is not practicable, the common bulkhead between the two spaces shall be insulated

to a standard of structural. fire protection equivalent to that required for a control station as defined in Schedule 1 of Merchant Shipping Notice MSN 1668 (M);

(g) direct access shall not be permitted between the machinery space and the space containing the emergency fire pump and its source of power except where the access is by means of an airlock, with each of the two doors being self-closing or through a watertight door capable of being operated from a space remote from the machinery space and the space containing the emergency fire pump and unlikely to be cut off ih the event of fire in those spaces. In cases where such access by means of an airlock is provided, a second means of access to the space containing the emergency fire pump and its source of power shall be provided;

(h) ventilation arrangements to the space containing the independent source of power for the emergency fire pump shall be such as to prevent the possibility of smoke from a machinery space fire entering or being drawn into that space.

Output Pressures

9. Any fire pump shall, when discharging the quantity of water required by the Regulations through adjacent fire hydrants in any part of the ship from nozzles of sizes specified in the Regulations, be capable of maintaining the following pressure at any hydrant -

(a) in any passenger ship -

(i) of 4,000 tons and upwards -310 kPa;

(ii) of 1,000 tons and upwards but under 4,000 tons -270 kPa;

(iii) of under 1,000 tons -210 kPa;

(b) Except that in any passenger ship of Class I, II and IIA ***constructed on or after 1st October 1994***, with two pumps simultaneously delivering through the nozzles specified by the Regulations and with sufficient hydrants to provide for the quantity of water specified in the Regulations, a minimum pressure of 400 kPa for ships 4,000 tons gross tonnage and above and 300 kPa for ships of less than 4,000 tons gross tonnage shall be maintained at all hydrants;

(c) in any ship other than a passenger ship -

(i) of 6,000 tons and upwards -270 kPa;

(ii) of 1,000 tons and upwards but under 6,000 tons -250 kPa;

(iii) of under 1,000 tons -210 kPa;

provided that the maximum pressure at any hydrant shall not exceed that at which the effective control of a fire hose can be demonstrated.

Fire Main

10. (a) The fire main shall have no connections other than those necessary for fire-fighting and washing down.

(b) Materials readily rendered ineffective by heat shall not be used for fire mains unless adequately protected.

(c) The fire hydrants shall be so placed that the fire hoses may be easily coupled to them.

(d) In ships which may carry deck cargo the fire hydrants shall be so placed that they are always readily accessible and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo.

(e) Unless one fire hose and nozzle is provided for each fire hydrant in the ship there shall be complete interchangeability of fire hose couplings and nozzles.

(f) Hydrant valves of the screw lift type or cocks shall be fitted in such position that any of the fire hoses may be isolated and removed while the fire pumps are at work.

(g) The water pipes shall not be made of cast iron, and if made of iron or steel shall be galvanised or altematively the pipe wall thickness shall be increased by a corrosion allowance.

(h) The arrangements of pipes and hydrants shall be such as to avoid the possibility of freezing.

Additional requirements for ships constructed after 1st September 1984:

(i) Isolating valves to separate the section of the fire main within the machinery space containing the main fire pump or pumps from the rest of the fire main shall be fitted in a position outside the machinery spaces which shall be easily accessible when there is a fire. The fire main shall be so arranged that when the isolating valves are shut all the hydrants on the ship, except those in the machinery space referred to above, can be supplied with water by a fire pump not located in this machinery space through pipes which do not enter this space. Exceptionally, short lengths of the emergency fire pump suction and discharge piping may penetrate the machinery space if it is impracticable to route it externally, provided that the integrity of the fire main is maintained by the enclosure of the piping in a substantial steel casing.

regulation 44(2)
Small ship regulations 35(2)

SCHEDULE 8

FIRE EXTINGUISHERS

1. (a) Portable fire extinguishers (other than carbon dioxide or halogenated hydrocarbon fire extinguishers) shall, if they are a type discharging fluid, have a capacity of not more than 13.5 litres and not less than 9 litres. Other capacities may be accepted provided such extinguishers are at least as portable as a 13.5 litre extinguisher and have an extinguishing capability at least equivalent to a 9 litre extinguisher.

(b) Portable carbon dioxide fire extinguishers shall have a capacity of not less than 3 kilogrammes of carbon dioxide, or such other capacity as may be approved by the Secretary of State.

(c) Portable dry powder fire extinguishers shall have a capacity of not less than 4.5 kilogrammes of dry powder, or such other capacity as may be approved by the Secretary of State.

(d) Portable halogenated hydrocarbon fire extinguishers shall have a capacity of not less than 7 kilogrammes of halogenated hydrocarbon.

(e) Portable fire extinguishers of other types shall be of not less than the fire extinguishing equivalent of a 9 litre fluid fire extinguisher.

2. Portable halogenated hydrocarbon fire extinguishers shall use either bromochlorodifluoromethane (B.C.F.)/(Halon 1211) or bromotrifluoromethane (B.T.M.)/(Halon 1301) as the extinguishing medium.

3. Portable fire extinguishers for use in accommodation or service spaces of any ship shall so far as practicable have a uniform method of operation.

4. Portable fire extinguishers shall be of an approved type and design and shall meet the requirements of British Standard BS 5423:1987.

5. Portable and non-portable fire extinguishers shall be periodically examined and subject to appropriate tests.

6. The number of portable dry powder fire extinguishers in accommodation and service spaces or in machinery spaces shall not exceed one half of the total number of extinguishers provided in either of these spaces.

7. Portable carbon dioxide and halogenated hydrocarbon extinguishers shall not be located in accommodation spaces. Where such extinguishers are provided in radio rooms, at switchboards and other similar positions, the volume of any space containing one or more extinguishers shall be such as to limit the concentration of vapour that can occur due to discharge, to not more than 5 per cent of the net volume of the space. For the purpose of calculation

(a) the volume of carbon dioxide shall be taken to be 0.56 metres^3/kilogramme;

(b) the volume of Hal.on 1301 to be 0.16 metres^3/kilogramme; and

(c) the volume of Halon 1211 at 0.14 metres^3/kil.ogramme.

8. Where portable halogenated hydrocarbon extinguishers are provided in machinery spaces their number shall not exceed one half of the total number of extinguishers provided in such spaces.

9. One of the portable fire extinguishers intended for use in any space shall be stowed near the entrance to that space.

10. Fire extinguishers shall not contain any extinguishing medium which has not been approved.

11. The capacity of a carbon dioxide or halogenated hydrocarbon extinguisher shall be taken to be the greatest weight of carbon dioxide of halogenated hydrocarbon respectively which it can safely contain in a tropical climate.

12. The capacity of any fire extinguisher, other than a carbon dioxide or halogenated hydrocarbon fire extinguisher, shall be taken to be the greatest volume or weight of extinguishing medium which it can contain when sufficient space is left to ensure the proper operation of the extinguisher.

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An executive agency of the Department of the Enviroment, Transport and the Regions