Annex A

Findings from The University of Wales report

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

The Conclusions deal in turn with environmental, use and surveying considerations; before suggesting a regionalisation of priorities. This is followed by a set of recommendations.

6.2 The Environment

A single isobath, 50m or otherwise, would not constitute a suitable criterion for the allocation of financial or other responsibilities for primary hydrographic surveying. The 50m contour in particular is generally to be found close to the coast, except in the south east, where it is far offshore, but exhibits a very complex geographical pattern. In the event of a specific isobath being used, the shipping and ports industries which are the primary concern of the Department of the Environment, Transport and the Regions' favour 100m. None of the isobaths relate particularly closely to the intensity of sea uses, either of the shipping industry itself, or the wider range of marine activities.

With regard to the acquisition of bathymetric data, the west coast is considered to be more important than the east coast, mainly because it is felt that the North Sea and English Channel are associated with good historical datasets and sea users know these areas comparatively well. More problems and potential surprises exist off the west and north coasts (including around Shetland and Rockall), which exhibit complex seabed topography, extensive rocky stretches, and are associated with an increasing volume of activities, notably deep water trawling and offshore oil exploration and exploitation.

6.3 Uses

In order to arrive at a more precise consideration of the Department of the Environment, Transport and the Regions' hydrographic surveying responsibilities, it may be better to begin by using a combination of isobaths, marine activities, shipping measures and distances from the coast as criteria. The following would have to be included:

(a) Main commercial shipping routes;
(b) All traffic separation schemes and related measures;
(c) Oil tanker routes;
(d) The main rocky seabed areas, especially those containing known pinnacles and seamounts;
(e) Areas of mobile seabed;
(f) Areas adjacent to major port approaches.

6.4 Delimitation of a Shipping Survey Region

Applying the above criteria in a combined fashion, an example of a 'shipping survey' region would be (Figure 6.1):

- use the 50m isobath and the median line from the Forelands to the Dogger Bank, and include the whole of this region;
- draw a line from the Dogger Bank to the 100m isobath off Fraserburgh, enclosing all traffic separation schemes and main shipping routes;
- follow the 100m isobath North of Fraserburgh around the North of Shetland to just South West of Shetland;
- then follow the 200m isobath Southwards to just South of Stornoway;
- draw a line from just South of Stornoway to the North coast of Northern Ireland, keeping within UK waters;
- follow the coast of Northern Ireland to the border with the Republic, then the 50m isobath nearest to Ireland until the 200m isobath is reached in the Celtic Sea;
- follow the 200m isobath until the median line is reached in the South West approaches;
- follow the median line Eastwards through the English Channel, taking due account of the Channel Islands, to the Forelands.

In order to compare this delimitation with existing priorities and completed admiralty surveys (Figure 4.2) an acetate version of figure 6.1 has been provided (Figure 6.2 - attached to rear cover of this report).

6.5 Priorities within a Civil Surveying Programme Limit

These may be placed in order as follows:

(1) Traffic separation schemes and measures with a set area surrounding them, to allow for incorrect use of lanes by ships on passage;

(2) Routes between traffic measures and from the main ports to the measures;

(3) All known tanker routes;

(4) The west and north coasts of Scotland;

(5) All rocky seabed areas, especially near to known pinnacles;

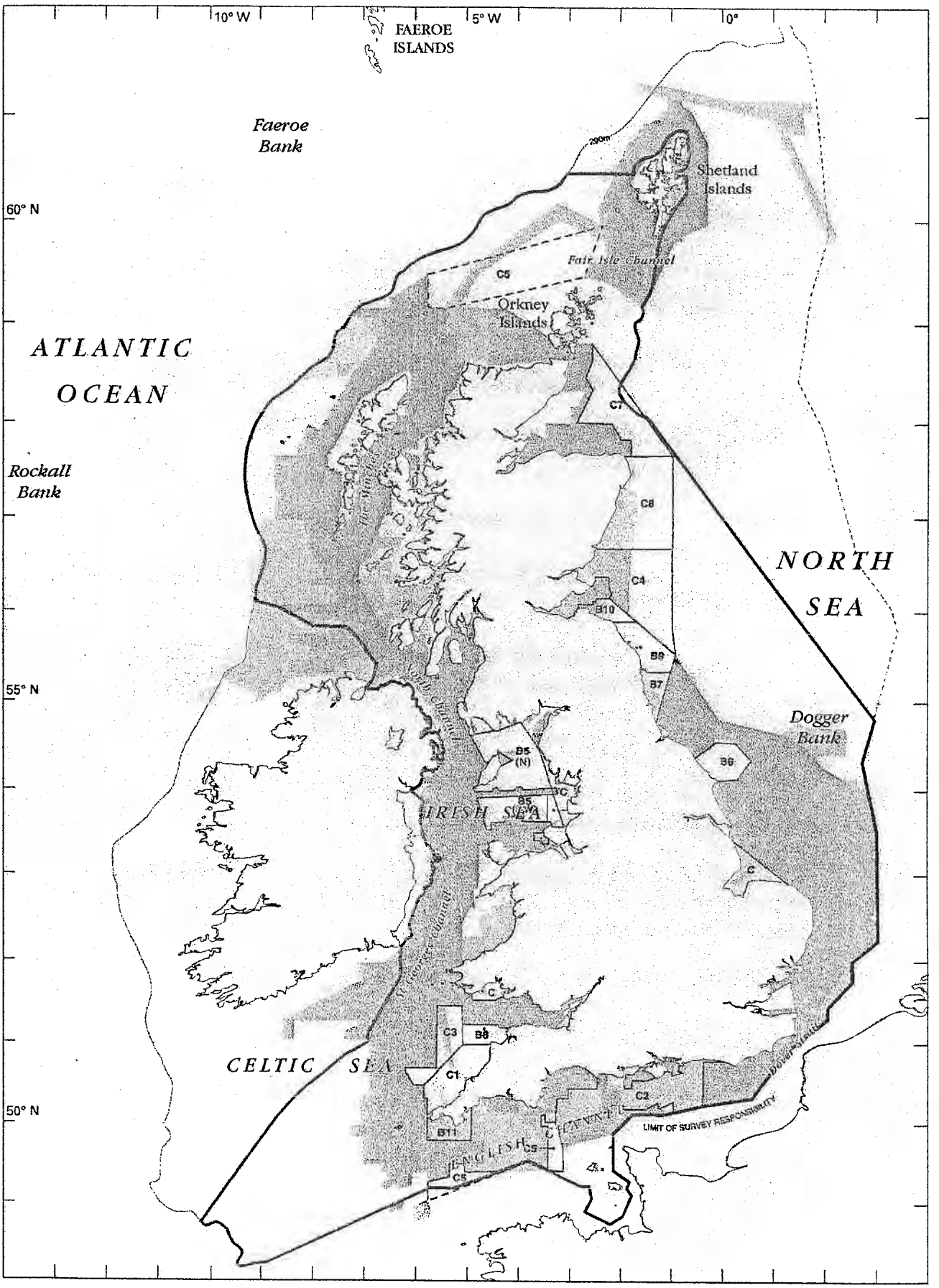

Figure 6.1 - Delimitation of a Shipping Survey Region

(6) The Northern approaches;

(7) The South West approaches;

(8) The Channel Islands;

(9) All other areas within the proposed limit not covered in 1-8 above.

6.6 Recommendations

These may be usefully considered under the following headings:

6.6.1 Immediate

(1) The Department of the Environment, Transport and the Regions, in conjunction with the Hydrographic Office, should establish the limits of its Civil Hydrographic Survey Programme responsibilities based on the criteria defined in paragraph 6.4. A single isobath, including one set at 50 metres, would be inappropriate for this purpose. Within the recommended survey responsibility limits, priorities should be considered and established using the ranked criteria set out at paragraph 6.5.

(2) The co-ordinating function of COSH should be reviewed, both in terms of membership and co-ordination with outside interests. Candidates for membership, in addition to existing members include, in particular, the UK Offshore Operators Association, the Natural Environment Research Council, the Scottish Fishermen's Federation, and the Royal Yachting Association. A wider consultative group may be desirable, incorporating all the major user interests outlined in Chapter 3.

6.6.2 Longer-term

(3) A comprehensive review of surveying activities on the UK Continental Shelf should be undertaken with particular reference to technical management of surveying to full modern standards, with a view to arriving at a clearer view of and policy applicable to the public/private sector division of technical and financial responsibility for surveying and allocation of costs to user groups.

(4) A comprehensive review of existing data bases and their present and potential use should be undertaken to guide future surveying programmes and projected outputs therefrom.

Annex B

The IHMC executive summary

Executive Summary

1. International Hydrographic Management Consulting (IHMC) Ltd. is pleased to present this draft report for discussion, as part of the Contract for Research Project 512 – A Long-term Strategy for the Civil Hydrographic Programme.

2. From a review of the legal requirements and the fact that SOLAS refers to all vessels, the United Kingdom (UK) has a right and an obligation to survey its internal waters and the territorial sea to the best of its ability using the most effective modern equipment available and to then produce nautical charting to international standards. The Maritime and Coastguard Agency (MCA) should also consider its responsibility to ensure safe navigation not only in its territorial sea and in close proximity to the coast but also within those areas beyond the territorial waters for which the UK has obligations in terms of the United Nations Convention on Law of the Sea (UNCLOS) to protect the environment.

3. While the UK has not as yet claimed an Exclusive Economic Zone (EEZ), MCA should carefully analyse the responsibilities to prevent pollution of the environment by the accidental discharge from vessels by ensuring safe navigation in areas of UK responsibility beyond territorial waters to the limits of any future claimed EEZ. The recommendations in this report are based on the assumption that the Civil Hydrography Programme (CHP) includes this entire area.

4. In establishing the status of surveys, British Admiralty (BA) Chart Q 6090, Edition 18th July, 2002 has been used as the main reference. For the purpose of studying the status of surveys for the CHP, this chart is deficient in that it does not extend to the limits of a future 200 mile EEZ or to boundaries with adjacent countries. From the analysis of the status of surveys, there are extensive areas of leadline surveys, particularly of the coastal waters of western Scotland and in a narrow strip along the west coast of England and Wales. For the entire region of MCA responsibility, only approximately 14% of the entire area is surveyed to a modern standard.

5. As Chart 6090 provides one of the bases from which the future CHP priorities will be determined, it is recommended that it be redrawn to provide greater detail on the quality of the surveys since the first introduction of sidescan sonar in the early 1970s. Ideally, the information should be included in a Geographic Information System (GIS) providing all the meta-data. It would also be helpful to provide more explicit information on the areas of mobile seafloor. Furthermore, it would be more informative if, either on Chart 6090 or on an accompanying chart, the areas covered by systematic surveys other than Admiralty Surveys carried out for chart production purposes were shown.

6. In examining the Users' requirements, this study has concentrated on those users who are interested in the MCA mandate to provide safety of navigation, while recognising that there are many more users of the sea with economic interests, such as hydrocarbon and aggregate extraction. Three main classes of users have been considered. These are commercial vessels, fishing vessels and leisure craft. It is recognised that the draft of these vessels is a particular concern in terms of seafloor clearance and safety.

7. From a review of the status of surveys and from the user requirements, priorities have been established. A risk analysis has been developed as an aid in establishing priorities. Eight geographic areas have been defined for which the relative priorities have been developed. The ongoing task of re-surveying the Southeast area has been recognised as the highest priority. In terms of new work, high priorities have been assigned to the surveying of areas off Western Scotland and coastal areas of England and Wales. Within this rather

general classification of priorities, certain features, such as Traffic Separation Schemes (TSS) need to be given higher priority. The annual surveying capacity with current methods and funding has been derived from looking at survey activity over the past four years and using this information and the survey priorities to provide this information.

8. Up until 2003, the CHP surveys have been carried out mainly with single beam echosounders and analogue sidescan sonar, tidal information has been derived from co-tidal charts, bottom samples have been collected following the Hydrographic Quality Assurance Instructions (HQAI) specification and all designated wrecks with a clearance depth of less than 40 metres have been mechanically swept. With the advent of multibeam echosounder (MBES) surveys, and using digital multi-pulse sidescan sonar, survey production can be increased considerably. This may be accomplished by reducing the overlap on MBES coverage, by reducing the number of bottom samples collected particularly in deeper water outside of anchoring areas, by reassessing the specification for mechanical sweeping and by operating at increased speed when conditions permit. In addition, depth accuracy can be improved by using offshore gauges to measure tides for offshore surveys and updating methods of applying tidal corrections. In water depths from the shoreline to its maximum depth range, LIDAR should be used to obtain hydrographic data at reduced cost. The use of synthetic aperture radar and analytical resurvey analysis tools should also be considered in an attempt to reduce the frequency of resurveys while at the same time not degrading accuracy.

9. In examining the matter of value for money, there are a number of changes that can be made to organization and logistics to improve performance. In particular, some changes are proposed to reduce overhead costs, improve liaison with the ports and alter the distribution of the work between the Naval Parties and the Commercial Contractors.

10. The possibility of improving productivity through modern technology and changed organizational practices have been reviewed and it has been estimated that if these are adopted the present production will be increased by at least 25%.

11. The total survey task has been examined for eight specific areas around the British Isles, totalling 723,181 km². Assuming an augmented rate of production according to the recommendations in various sections of the report, 6000 to 7000km² can be surveyed annually, if resurveys are not considered. With 14 % currently surveyed, the unsurveyed area is approximately 620,000 km². It is therefore estimated that even using the most modern methods currently available, with the existing budget allocation it will take 90 to 100 years to bring all the surveys to modern standards. The result of a direct mathematical calculation requires considerable explanation, however, as many of the more difficult areas are already surveyed and a considerable amount of the unsurveyed area is in deeper water. This is, nevertheless, counterbalanced by the huge extents of coastline not surveyed and slow to survey from surface vessels. If LIDAR surveys prove to be as effective as they have been demonstrated to be in other countries, then the time period could be reduced. It can also be assumed that other survey methods will become more efficient.

12. The present status of surveys and rate of progress in carrying out surveys is clearly unacceptable, considering the reputation of the United Kingdom as a maritime state. Based on the assumption that the task should be completed within 15 years, the MCA allocation needs to be increased by six times to achieve this objective. Although not mentioned elsewhere in the report, there are other alternatives that could be considered. One would be to double the budget on an urgent basis and schedule a review for five years hence to assess progress. These are issues that can only be decided upon by the respective organizations.

IHO S-55: Summary Report on Status of Hydrographic Surveys for areas between 0 and 200m

IHO S-55: Summary Report on Status of Hydrographic Surveys for areas between 0 and 200 m.

A1 = % which has been adequately surveyed
B1 = % which requires re-survey at larger scale or to modern standards
C1 = % which has never been systematically surveyed
An entry of -1 in column A1 indicates inland waters.

Nation/Area	INT Region	A1	B1	C1
Portugal	G	100	0	0
India	J	100	0	0
Comoros	H	100	0	0
France Eparses Islands	H	100	0	0
Chile Easter I & Salay-Gomez	C2	100	0	0
Chile Islas Juan Fernandez	C2	100	0	0
Chile Islas San Ambrosio & San Felix	C2	100	0	0
Denmark Faeroe Islands	D	100	0	0
Belgium	D	100	0	0
Monaco	F	100	0	0
Japan Minami Tori Shima	K	100	0	0
France New Caledonia	L	100	0	0
France Guadeloupe and Martinique	B	99	0	1
Sao Tome & Principe	G	99	1	0
China (including Hong Kong and Macau SAR)	K	98	0	2
Bangladesh	J	95	3	2
France F	F	95	4	1
Denmark	D	95	5	0
Germany E	E	95	5	0
Germany D	D	95	5	0
Spain F	F	95	5	0
UK Gibraltar	F	95	5	0
Spain G	G	92	8	0
Singapore	K	90	8	2
Malaysia	K	90	10	0
Peru	C2	90	10	0
Pakistan	I	90	15	0
France D	D	86	0	14
France Wallis and Futuna Islands	L	86	0	14
Bulgaria	F	84	10	6
Turkey	F	83	17	0
France G	G	81	0	19
New Zealand	L	80	5	15
Netherlands Aruba & Netherlands Antilles (Leewar	B	80	10	10
Slovenia	F	80	20	0
UK Ascension Island	H	80	20	0
UK Cayman Islands	B	80	20	0

Nation/Area	INT Region	A1	B1	C1
Russian Federation	E	76	20	4
Norway	D	75	7	18
Ukraine	F	75	25	0
Netherlands Antilles (Windward Islands)	B	70	15	15
Sierra Leone	G	70	20	10
UK Anguilla	B	70	30	0
Guyana	B	70	30	0
Cuba	B	70	30	0
Estonia	E	70	30	0
Rep of Korea	K	70	30	0
Colombia B	B	69		31
Italy	F	67	26	7
Djibouti	J	66	34	0
Cape Verde	G	65	1	34
France Mayotte	H	65	25	10
Bahrain	I	63	31	6
Portugal Madeira	G	62	0	38
UK Falkland Islands Dependencies	C1	60	15	25
USA	A	60	35	5
UK British Virgin Is	B	60	40	0
Rep of S Africa	H	60	40	0
Senegal	G	58	0	42
Netherlands	D	56	34	10
Colombia C2	C2	55		45
Spain Canary Islands	G	55	45	0
Portugal Azores	G	53	46	1
Tunisia	F	53	47	0
Brazil	C1	52	48	0
Congo	G	51	0	49
Angola	H	50	48	2
Grenada	B	50	50	0
Mauritania	G	49	36	15
Antigua and Barbuda	B	48	52	0
UK	D	45	24	31
Barbados	B	45	55	0
Namibia	H	40	0	60
Rep of S Africa Prince Edward Islands	H	40	0	60
France Réunion	H	40	30	30
Japan	K	40	53	7
Jamaica	B	40	60	0
Iraq	I	40	60	0
Myanmar	J	40	60	
Haiti	B	40	60	
Croatia	F	39	39	22

Nation/Area	INT Region	A1	B1	C1
Gabon	G	37	0	63
Oman	J	35	5	60
Australia	L	35	20	45
Norway Jan Mayen	D	35	35	30
Greece	F	35	55	10
Trinidad and Tobago	B	35	65	0
Morocco	F	30	0	70
UK S Georgia and S Sandwich Islands	C1	30	0	70
UK Tristan da Cunha & Gough I	H	30	50	20
Poland	E	30	61	9
Thailand	J	30	70	0
Gambia	G	30	70	0
Kenya	H	30	70	0
Côte d'Ivoire	G	27	0	73
Chile	C2	27	18	55
Papua New Guinea	L	25	0	75
Saudi Arabia	I	25	5	70
Latvia	E	25	25	50
Seychelles	H	25	40	35
Albania	F	25	45	30
Philippines	K	25	50	25
Finland	E	25	65	10
USA Hawaiian Islands & Midway Is	A	25	75	0
Panama	B	25	75	
Iceland	D	24	12	64
France Terre Adelie	M	22	11	67
New Zealand Balleny Islands	M	20	0	80
Ecuador	C2	20	5	75
Ghana	G	20	15	65
UK St Helena	H	20	30	50
Argentina	C1	20	40	40
Tanzania	H	20	65	15
Nigeria	G	20	70	10
France French Polynesia	L	16	39	45
Madagascar	H	15	18	67
Dominica	B	15	20	65
UK S Orkney and S Shetland Islands	M	15	20	65
France Guyane	C1	15	66	19
UK Montserrat	B	15	85	0
St Lucia	B	15	85	0
St Kitts & Nevis	B	15	85	0
Belize	B	15	85	0
Guinea	G	14	0	86
Mexico	B	13	87	0

Nation/Area	INT Region	A1	B1	C1
Australia Norfolk Island	L	10	0	90
New Zealand Niue	L	10	5	85
Tuvalu	L	10	30	60
Solomon Islands	L	10	30	60
Qatar	I	10	70	20
Ireland	D	10	85	5
Mozambique	H	10	90	0
St Vincent & the Grenadines	B	10	90	0
El Salvador	B	10	90	0
Romania	F	10	90	0
Mauritius	H	10	90	0
Costa Rica	B	10	90	
Cameroon	G	9	0	91
Sri Lanka	J	8	88	4
Sweden	E	8	92	0
Benin	G	6	0	94
UK British Indian Ocean Territory	J	5	0	95
Tokelau	L	5	0	95
Togo	G	5	0	95
France French Southern Territories	H	5	0	95
Somalia	J	5	1	94
UK Turks & Caicos Is	B	5	5	90
Malawi	H	5	50	45
Vanuatu	L	5	55	40
Samoa	L	5	65	30
Fiji	L	5	70	25
Honduras	B	5	80	15
Lithuania	E	5	95	0
Nicaragua	B	5	95	
Algeria	F	4	48	48
Australia Christmas Island	L	3	97	0
Eritrea	J	2	0	98
Liberia	G	2	22	76
Tonga	L	2	28	70
Norway Svalbard	D	2	50	48
Australia Macquarie Island	L	1	0	99
Sudan	J	1	0	99
France Saint Pierre & Miquelon	A	1	0	99
Australia Heard I and McDonald Is	H	1	0	99
Australia Cocos (Keeling) I	L	1	0	99
Syria	F	1	1	98
Yemen	J	1	6	93
Cook Islands	L	1	9	90
Vietnam	K	1	30	69

Nation/Area	INT Region	A1	B1	C1
UK Bermuda	A	1	34	65
Bahamas	B	1	99	0
Malta	F	1	99	0
Yemen Socotra Island	J	0	0	100
Timor Leste	K	0	0	100
France Clipperton Island	A	0	0	100
UK Pitcairn Dependencies	L	0	0	100
Norway Bouvetøya	H	0	0	100
Nauru	L	0	0	100
Norway Peter I Øy	M	0	0	100
Antarctica, excluding Peninsula	M	0	1	99
Maldives	J	0	3	97
France St Barthelemy	B	0	5	95
Lebanon	F	0	10	90
USA Aleutian Islands	A	0	10	90
USA Johnston Atoll	A	0	10	90
USA Navassa Island	B	0	10	90
USA Puerto Rico & US Virgin Is	B	0	10	90
USA Guam	K	0	10	90
USA Wake Island	K	0	10	90
USA American Samoa	L	0	10	90
USA Howland & Baker Islands	L	0	10	90
USA Jarvis Island	L	0	10	90
USA Kingman Reef & Palmyra Island	L	0	10	90
Kiribati	L	0	20	80
Cambodia	K	0	34	66
Antarctic Peninsula	M	0	40	60
Jordan	J	0	90	10
Guinea Bissau	G	0	95	5
Serbia Montenegro	F	0	100	0
Suriname	B	0	100	0
Azerbaijan	F	0	100	0
Western Sahara	G	0	100	0
Cyprus	F	0	100	0
Equatorial Guinea	G	0	100	0
DRC	G	0	100	0
Brazil St Peter and St Paul Rocks	C1	0	100	0
Brazil Trinidade & Martin Vaz Is	C1	0	100	0
Mali	G	-1		
Burundi	H	-1		
Uganda	H	-1		
Luxembourg	D	-1		
Hungary	F	-1		
Slovakia	F	-1		

Nation/Area	INT Region	A1	B1	C1
Paraguay	C1	-1		
Bolivia	C2	-1		
Switzerland	D	-1		
Belarus	E	-1		
Czech Republic	E	-1		
Austria	F	-1		
Central African Republic	G	-1		
Chad	G	-1		
Niger	G	-1		
Zambia	H	-1		
Zimbabwe	H	-1		
Ecuador Galapagos Islands	C2			
Canada	A			
Dominican Republic	B			
Guatemala	B			
Venezuela	B			
Uruguay	C1			
Denmark Greenland	D			
Bosnia-Herzegovina	F			
Egypt	F			
Georgia	F			
Israel	F			
Kazakhstan	F			
Libya	F			
Rep of Moldova	F			
Turkmenistan	F			
Uzbekistan	F			
Palestinian Authority	F			
India Andaman Islands	J			
Iran	I			
Kuwait	I			
UAE	I			
Brunei Darussalam	K			
DP Rep of Korea	K			
Indonesia	K			
Marshall Islands	K			
Palau	K			
Paracel Islands	K			
Spratly Islands	K			

Annex D

List of Invitees to the 2006 COSH Meeting

List of Invitees to the 2006 COSH Meeting

Marine Coastguard Agency – Chair

UK Hydrographic Office

Marine Accident Investigation Branch

Royal Yachting Association

Conference of Yacht Cruising Clubs

Trinity House

Port of Wisbech

Northern Lighthouse Board

Commissioners of Irish Lights

English Heritage

Seafish

Department for Transport

Port of London Authority

Associated British Ports Group

Chamber of Shipping

Environment Agency

University College, London

British Geological Survey

Ministry of Defence

National Oceanography Centre