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## REGISTRATION OF RESEARCH AND DEVELOPMENT PROJECTS

### Summary Table of Projects (9)

- 1 The Maritime Safety Committee, at its sixty-first session (7 to 11 December 1992), instructed the Secretariat to invite Member Governments to provide the Organization with information on ongoing research and development projects. This was done by MSC/Circ.605.
- 2 The Committee, at its sixty-second session (24 to 28 May 1993), approved the format of a summary table of research and development projects prepared by the Secretariat (MSC 62/WP.1, annex) and authorized dissemination of information on reported projects by means of MSC circulars on a quarterly basis.
- 3 The Committee, at its sixty-ninth session (11 to 20 May 1998), taking into account the trend of information provided for the last six quarters, decided to issue the MSC circular containing information on ongoing research and development projects on an annual basis.
- 4 The annex, in the agreed format, contains information on research and development projects reported to the Organization during 1998.

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## ANNEX

## Summary Table of Maritime Research Projects

State's Name

UNITED KINGDOM

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
Maritime & Coastguard Agency, Spring Place, 105 Commercial Road, Southampton, SO15 1EG.  Tel: 44 1703 329100 Fax: 44 1703 329298	Research Project 278 - Ro-Ro Survivability Model Tests - Phase 2	Follows phase 1, projects 244 and 245. Work will feature modified Ro-Ro models incorporating the stability/survivability improvements identified elsewhere in the Ro-Ro research programme.  Results presented to the RINA Seminar in November 1994.	Completed (1993)	SLF

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 279 - Additives to GRP Structures	<p>To obtain information about the strength and long term durability of the glass reinforced plastics which are used in the manufacture of lifeboats, especially those with fire retardant additives.</p> <p>The results were presented at the European Free Trade Association (EFTA) and accepted for inclusion as the new testing standard, at their 25th meeting in October 1994.</p> <p>The results were further presented to IMO on the form of a test procedure to be adopted as a revision to Resolution A.689(17) Testing and Evaluation of Life Saving Appliances, at the Life saving Search and Rescue LSR 26 Sub-Committee meeting April 1995, paper LSR 26/12/1. The results were written into and amended the test procedure in the revision of the MSA's Survey of Life Saving Appliances Volume 2, published in 1994.</p>	Completed (1993)	DE
	Research Project 280 - Hazards from Residual Fuel Oils (project complete)	<p>To assess available information on the possible carcinogenic effects on ships crews of present day fuel oils and used lubricating oils. This will enable DTP to produce a merchant shipping notice.</p> <p>The results of this research were presented at MEPC in March 1992. The M Notice 1521 Possible Hazards to Seamen from Oils Used on Ships was issued in March 1993 and all the recommendations of the report have since been implemented.</p>	Completed (1993)	BLG/MEPC

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 288 - Securing of Cargo on Offshore Supply Vessels (project complete)	<p>To find a safe and quick method of lashing and releasing the cargo carried on offshore supply vessels that will ensure that the cargo is securely and quickly lashed in place and released in the field.</p> <p>A general statement drawing attention to this potentially hazardous activity was included in the Code of Practice for the Safe Management and Operation of Offshore Support Vessels. This is published by UKOA (United Kingdom Offshore Operators Association) and was developed in conjunction with the MSA.</p>	Completed (1993)	DSC
	Research Project 289 - Exhaust Emissions from Ships - Phase 2 (Single Tender)	<p>IMO are proposing limitations on ships exhaust emissions. There is an urgent need to obtain data on these emissions to enable realistic considerations to be given to any limits or restrictions that may be imposed internationally. Sound data needed.</p> <p>This work was presented at the BCH 23 meeting in September 1993. The results were used in the IMO's development of the proposed air pollution prevention legislation (MARPOL Annex VI).</p>	Completed (1993)	MEPC

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 291 - Survey of MARPOL Annex 2 - Chemicals in and out of UK	<p>To conduct a survey of bulk chemicals and liquefied gases which are loaded or unloaded in UK ports and terminals. To enable DTP to develop suitable inspection strategy.</p> <p>The results were used determining the policy on the enforcement of Regulations covering bulk liquid chemicals and liquefied gases.</p>	Completed (1993)	BLG
	Research Project 292 - One Man Bridge operation at Night qv (249)	<p>To carry out trials covering 6 ships, of various types and plying a variety of trades, to judge whether one man bridge operation at night is safe and acceptable. Follows on from Project 249.</p> <p>Four recommendations made but can only be implemented when the OMBO has received approval of the scheme by IMO.</p>	Completed (1994)	NAV
	Research Project 296 - Passenger and Crew Behavioural Analysis in Emergency Sits.- Ph I	<p>To draw on accounts of disasters in order to develop some principles of crowd management in crisis situations and cross refer to passenger behaviour in panic situations on ferries. (MAIB and WHICH? Have also expressed an interest in research in this area).</p> <p>The results of this project were taken forward in Project No 323 in order to develop a sound methodology for dealing with the behaviour of ship's passengers and crew in emergency situations.</p>	Completed (1993)	MSC

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 298 - Toxicity Evaluation of Fire Resisting Materials	<p>To provide information on toxic vapours in fire conditions from approved fire resisting materials and to present this to IMO in order to produce suitable standards.</p> <p>As a result of this research, and contributions submitted by other members of the fire protection Sub-Committee, that Committee was able to draft MSC 41(64) which was subsequently adopted as the 'Interim Standard for Measuring Smoke and Toxic Products of Combustion'. This standard is similar in concept to NES 713, as used in the research project, but uses a different apparatus defined in ISO 5659 Part 2.</p>	Completed (1994)	FP
	Research Project 305 - Watchkeeper Collision Avoidance Behaviour - Phase 1	To identify potentially dangerous styles of collision manoeuvring, ambiguous situations in geometry of collision avoidance manoeuvres, and hazardous sea areas and conditions.	Completed (1994)	NAV
	Research Project 306 - Safety Assessments: Applicability to Passenger Ships	<p>For each ship type, the audit covers safety related factors, including hazard potential, risks to life, etc. Details of operational practice to be obtained from ship owners, managers, officers and crew.</p> <p>A UK paper MSC 62/24/3: Formal Safety Assessment (FSA) was submitted to IMO for discussion.</p>	Completed (1993)	MSC

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 307 - Stability of Large Catamarans - Phase 1	With the advent recently of large passenger and car carrying wave piercing catamarans there is a need to undertake a fundamental assessment of their stability characteristics.	Completed (1994)	SLF
	Research Project 316 - Wave Induced Vibrations in Large Vessels - Phase 1	<p>1. To establish through a literature search of existing data whether firm evidence of wave induced vibrations coinciding with a vessel's natural frequency can be confirmed.</p> <p>2. To measure low frequency hull vibrations on a bulk carrier when loaded and when in ballast and to carry out similar measurements on two other ship types to establish hull natural vibration frequency levels.</p> <p>The IMO work on the safety of ships carrying solid cargoes in bulk is ongoing and the research projects results have been used in formulating the UK contribution to the IMO work.</p>	Completed (1993)	DE

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 317 - Drainage and Settlement: Iron Ore Concentrate - Phase 3	<p>1. Completion of small scale tests on/modelling of iron ore concentrate;</p> <p>2. Review, assess and develop methods of sampling and testing of solid bulk cargo materials in stockpiles and cargo holds;</p> <p>3. Carry out large scale measurements of iron-ore concentrate to validate small-scale tests (in laboratory and on board ships);</p> <p>4. Investigate efficiency of present system of drainage in concentrate carriers (on board ships)</p> <p>The results of this research were presented to the IMO Sub-committee on containers and cargoes, 32 session BC 32.</p> <p>It was recommended that the project continued into further phases, and this has been the case. Phase 5, research project 350 - Drainage and Settlement: Iron Ore Concentrate, is currently underway.</p>	Completed (1993)	DSC
	Research Project 318 - Failure Mode and Effect Analysis on High Speed Craft	<p>To produce a Failure Mode and Effect Analysis for the directional control system on a high speed craft and thereby to enable the Department to evaluate any such system both for the effectiveness and for an acceptable risk level.</p> <p>We presented the results to IMO for use in the revision of the Code of Safety for Dynamically Supported Craft.</p>	Completed (1993)	DE

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 320 - Review of Current and future Marine Anti-fouling Coatings	<p>A preliminary survey is proposed which will critically review the available data on the performance, environmental effects and cost implications of current and proposed marine coatings. From this data a comprehensive and independent data base will be constructed. This, in turn will enable an informed contribution to be made at MEPC 33 when discussions on marine coatings will be resumed.</p> <p>The results of this research was presented to MEPC 35 in January 1994. It was used to help formulate MSA policy on this subject and provided input into the IMO and the 4th North Sea Conference.</p>	Completed (1994)	MEPC
	Research Project 322 - The in-service performance of Oily Water Separators and Bilge Monitors	<p>To determine whether the portable meter is required as a tool for use at the re-survey of oil prevention equipment by identifying the oil in water content of in-service OWS effluent; and the accuracy of the service bilge monitors.</p> <p>The results of this research provided the basis for and additional information for Research project 353 - Improved Oily Water Separation Techniques.</p>	Completed (1993)	MEPC

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 334 - Investigation into the problems associated with VLCCs & Bulk Carriers	<p>To conduct, in the first instance, a literature search, investigation and appraisal of the work being carried out elsewhere in this area. This will allow the Department to identify important areas in which to carry out further research.</p> <p>Lord Donaldson's 1995 assessment of the 'Derbyshire' loss included work carried out by two technical assessors. The assessors referred to project 334.</p>	Completed (1994)	DE/MSC
	Research Project 337 - Bilge Water Settling Tanks used on board Ships	<p>To identify factors which influence bilge water settling tank performance. Information obtained will be used to determine design parameters for such tanks, which will allow pre-separation of oily water mixtures.</p> <p>The results of this research were presented to MEPC 35 in January 1994 and further research has since been commissioned into the processing of bilge water.</p>	Completed (1994)	MEPC
	Research Project 340 - Effectiveness and Practical Application of Simulators as Tools for Training and Examining Seafarers	<p>To assess the effectiveness of ship simulators as training tools, and the extent to which they could be used to assess competence for qualifications, etc.</p> <p>The results will be used to instigate an approved method of assessing candidates' competence in the light of the new National Vocational Qualification (NVQ) system</p>	Completed (1994)	STW

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 341 - Behaviour of ILRs in Containers when Forcibly Submerged	<p>To carry out tests to ascertain the behaviour of inflatable life-rafts in their containers when forcibly submerged to greater depths than at which they are presently arranged to float free.</p> <p>The results of this research were presented to IMO as an information paper to the 25th Life Saving, Search and Rescue Sub-Committee in February 1994.</p> <p>The results indicated in this project supported the MSA's contention that when life-rafts in their containers are forcibly submerged without the fitting of float free arrangements, as they will float to the surface. This would be dependent upon them not being restrained in any way when fitted in their life-raft cradle on a vessel.</p> <p>Based on the confirmation of this research there was no need to propose any amendments to international or our own national legislation, including the issue if an Advisory Notice.</p>	Completed (1994)	DE

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 342 - Ventilation of Ro-Ro Ferry Vehicle Spaces - Phase 2	<p>To follow on from project 286. To utilise methodology devised in phase 1 to determine air quality on vehicle decks when “worst case” pollution levels may be expected - eg, July and August.</p> <p>The results of this research project were used by a drafting group of the Ship, Design and Equipment Committee 37 in February 1994 in order to refine the draft guidelines on Ro-Ro ventilation.</p> <p>Recommendations pertaining to revising standards for the provision of acceptable air quality and levels of fire protection are still under consideration. It is anticipated that an M notice will be produced, highlighting some of the findings of the research project, once the draft guidelines on Ro-Ro Ventilation have been agreed and published by MSC 66.</p>	Completed (1994)	DE/MSC

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 344 - Safety on Board Fishing Vessels (Fishing Industry Training Assoc.)	<p>The Department is making a contributory payment towards a project being carried out by the Fish Industry Training Association aimed at improving fishing vessel safety. This will include Man Overboard recovery form small fishing vessels and the design of personal safety lifesaving appliances.</p> <p>The results have enabled the Fishing Industry Training Association to improve the instructions given to fishermen about survival and retrieval from the sea.</p> <p>The findings have been of assistance to the MSA in the work of the Fishing Industry Safety Group and in sea trials of Constant water Buoyancy Aids from several manufacturers.</p>	Completed (1994)	SLF/DE
	Research Project 345- Study of the Implementation of a A1 Sea Area in the UK	<p>To study methods of achieving the task of introducing DSC into HMCG Rescue Centres and network of 120 VHF stations. The study will need to identify the most cost effective method given the tight time scale given for the completion for 1995.</p> <p>The result of this project was the definition of the optimum method of introducing DSC into Coast Guard stations. It has been adopted by the Coast Guard and is currently in the process of being implemented for full operation by Autumn 1998.</p>	Completed (1995)	COMSAR

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 346 - Drug and Alcohol Abuse	<p>To consider, by reference to all interested and relevant parties, the magnitude of the problem of drug and alcohol abuse afloat. To collect sufficient information on the subject as to enable the SGO to decide on further action. To observe how the problem is tackled in the industry at present and in other relevant industries and to advise on suggested legislative and/or advisory ways forward.</p> <p>Research has shown that Legislation is likely to prove un-popular within the leisure industry and would prefer to see a voluntary C of P seeing prevention through education.</p> <p>"Due diligence" would provide the most acceptable basis for regulation within both self regulated commercial sectors, and non-self regulating sectors.</p>	Completed (1995)	MSC/MEPC
	Research Project 347 - Theoretical study of success rates and false alert rates in the GMDSS	<p>The objective of the project is to deduce the probability of generating a successful distress alert and the probability of generating a false alert and deduce the relationship between the two.</p> <p>This study deduced the source of the false alerts in GMDSS. Equipment was found to be generating false alerts once in 45 years. Ships were found to have actual distress situations at about 1 in 450 years. The study showed, through theoretical concepts that the false alert rate would be 10 times greater than the actual distress rate.</p>	Completed (1995)	COMSAR

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 348 - Assessment of safety from capsize of small vessels (up to [30m] overall length)	To review the criteria which are used at present for the assessment from the safety of capsize of small vessels and produce proposals for simple to apply effective measures for designers, surveyors and operators of the vessels.	Completed (1994)	MSC
	Research Project 353 - Improved oily water separation techniques	To determine the most suitable techniques for use in shipboard oily water separation  As a result of this project, further research was recommended into 'Membrane filters for bilge water separation', which was approved by the research committee.	Completed (1995)	MEPC
	Research Project 354 - Dis-infection of ballast water	To determine whether the dis-infection of ballast water by dosage with metallic ions is effective and economic. To identify other effective sterilisation methods.  The research concluded that metallic ions are not effective but that UV Sterilisation may be suitable given development. The results were submitted to IMO's MEPC for information and dissemination.	Completed (1995)	MEPC

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	Research Project 356 - Strategy for human element research	<p>The human element is an important factor in maritime studies. The MSAs responsibility includes concern with those aspects of safety at sea which arise from human behaviour on board.</p> <p>The research identified a range of areas of human failure including; carelessness, errors of judgement, fatigue, language difficulties etc.</p> <p>It was recommended that the research for the Agency should be prioritized in order to reduce the contribution of the human element to shipping casualties.</p>	Completed (1995)	MSC/MEPC
	Research Project 357 - Strength appraisal of lifeboat davits and winches	<p>Consider elastic displacement of the structures in all planes which are likely to produce a failure of the system. Consider the effects of any localised high loading and plastic deformation in the vicinity of the load to initiate and then sustain progressive failure of the system.</p> <p>Computer software was prepared for four main types of ship board davits and three types of winch gearing. The programme displays displacement etc. and carries out calculations and analysis using key input data. Final results can be viewed and printed which will give the stresses and factors of safety at any requisite section.</p>	Completed (1995)	DE

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 358 - Cost benefit analysis of sewage pollution control regulations	<p>To provide an environmental benefit against cost analysis for the application of MARPOL Annex IV regulations as they stand. To determine optimal breakpoints, of ship size, number of people carried and geographical range of application of relegation's for maximum environmental protection without entailing excessive cost.</p> <p>The results are to be further considered by the Standing Advisory Committee on the Carriage of Dangerous Goods in ships for consideration at their next sitting. Members comments will be consolidated and a draft paper for presentation at the IMO will be prepared for postal consolidation.</p>	Completed (1995)	MEPC
	Research Project 360 - An investigation into improved anchoring systems	<p>To identify and evaluate existing research into anchoring systems in order to establish adequacy or inadequacy of conventional anchoring systems in slowing and stopping large drifting tankers.</p> <p>The study found that little research has been carried out world wide into the use of anchoring systems. Results have shown that components of current anchoring systems are sized according to benign steady state conditions. They are not designed to stop a large drifting ship.</p> <p>It was recommended that further research is needed into ship size and limiting water depth, and the effect of sea bed type on the use of anchoring systems to arrest drift.</p>	Completed (1995)	DE

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 361 - Assessment of Potential Hazards from Ballast Water in UK Waters	<p>To establish how vulnerable the UK may be to non-indigenous organisms and what level of control may be appropriate if any.</p> <p>The research has shown that the non-indigenous planktonic organisms were transported in ballast water - assessing whether these non-indigenous and potentially harmful organisms are likely to become established in UK waters is a considerably more complex task, but one which should be subject to further investigations. The results also show the presence of resting cysts of toxic dinoflagellates which is an issue that should be addressed in future ballast water treatment options and that marine environment managers should be aware of a problem of secondary transport within the UK in addition to introductions from abroad. The results were presented to MEPC 40 and MSA will disseminate the results through the EC and North Sea Conference states to inform any consideration of precautions in relation to regional trade.</p>	Completed (1998)	MEPC
	Research Project 362 - Ro-Ro ferry door safety study	<p>To undertake a rigorous assessment of various current designs of bow and stern door configurations and their associated mechanisms to gauge their inherent safety and reliability.</p> <p>Interim results were used during the IMO panel of experts discussions in formulating proposals for SOLAS amendments. A series of recommendations made on changes in ferry design.</p>	Completed (1995)	MSC

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	Research Project 363 - User requirements for new navigation systems	<p>To define the user requirements for identification transponders ship to shore, ship to ship, the requirements for information transfer, to define the user requirements for sound reception systems, to define the requirements for electronic position fixing systems together with the requirements for accuracy in the various phases, with particular regard to the UK.</p> <p>This project used questionnaires to identify user requirements for new Navigation Systems proposed for mandatory carriage on ships in the future. Results were successfully submitted to the discussions taking place in the IMO and IEC to assist in the drafting of technical standards of new equipment.</p>	Completed (1995)	NAV
	Research Project 364 - Capsize and Stability of sailing multi-hulls	<p>To examine a range of sailing multi-hulls, and identify the occurrence, circumstances and mechanism of any stability casualty, to determine the critical design features which influence each mechanism of capsize for each characteristic vessel type.</p> <p>The MSA will consult with members of the working groups on Small Commercial Vessel and Megayacht Codes to discuss the implementation of how the recommendations from this project can be applied to vessels at this time.</p> <p>Phase 2 of this project is under consideration and is likely to be put out for tender in February.</p>	Completed (1996)	SLF

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 365 - Quantifying waste generated by all ships and platforms operating in the North Sea	<p>To develop a method of predicting operational waste onboard ships related to at least, bunker capacity, installed power, fuel used, number of people onboard , cargo onboard, fishing gear, age of vessel. To determine the scale of waste production, both garbage and oily residues.</p> <p>The results indicated that levels of waste produced by vessels are highly variable dependent upon a variety of factors.</p> <p>It was noted that there is also generally poor handling of hazardous waste.</p> <p>Research suggested that all ports should have a minimum of a four category segregation system for solid wastes, and at least two liquid categories.</p>	Completed (1995)	MEPC
	Research Project 366 - Formal safety assessment of shipping	<p>To demonstrate the practicability of FSA by developing and applying the first two steps of the FSA to a generic ship representative of international shipping</p> <p>The study has shown that FSA is predictable and beneficial to the shipping industry and worthy of consideration by IMO in support of regulatory processes.</p>	Completed (1996)	MSC

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 367 - Unmanned Machinery Spaces	<p>To define 'Unmanned Machinery Space' for the purpose of policy making, e.g. is the Machinery control room (MCR), in or out of the machinery space, if the (MCR) is on the bridge, is the engine room unmanned.</p> <p>The MSA will give further consideration to the results of this project in order that a clear directive can be issued on the policy towards UK and Foreign Flag vessels whilst operating in the UMS mode. The IMO will also consider these findings to the future design of UMS systems.</p>	Completed (1996)	STW
	Research Project 369 - The Identification of Technical Aids to assist surveyors in probing ship maintenance standards	<p>To identify existing technical aids currently available to enable maintenance standards of both the hull and machinery to be assessed.</p> <p>The results of this project were submitted to the DE Sub-Committee which met at IMO. With regard to the UK, the work has been used to identify and provide MSA surveyors with oxygen monitoring devices and electronic metal thickness gauges which are being used during Port State Control inspections. The inspections of larger cargo ships now form key targets in the port state control regime introduced on 1 January 1996 through the Merchant Shipping (Port State Control) Regulation 1995.</p>	Completed (1996)	MSC/MEPC

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 375 - Reliability Assessment of Overboard Discharge Monitors	<p>To confirm whether OCM's are reliable and, if so, to determine what causes of unreliability might be.</p> <p>Written information and wide consultation with manufactures, users and surveyors concluded that there is convincing qualitative evidence that overboard discharge monitoring systems are frequently effective. Report submitted to MEPC 38, identified the need for more information regarding the ability of existing monitors to discriminate oil from other contaminants such as detergents, rust and soot. It was also considered necessary to investigate the effects of vibration and temperature variation.</p>	Completed (1998)	MEPC

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 378 - Carriage of Petroleum Products on Scottish Island Ferries	<p>To identify whether there is any more risk of an explosion from carrying petrol in and unspecified capacity road tank vehicle as opposed to carrying 2550 gallons maximum on any tanker given specified carriage conditions.</p> <p>As a result of this research the MSA believes the policy line should be to agree the increase in the overall capacity of the road tankers to 18,000 litres which is the proposed level agreed by vehicle operators and shipowners. The principle of restricting the capacity and zone of operation of low flashpoint cargoes on board ships which also carry passengers, is retained.</p> <p>Vehicles operators have agreed to modify their vehicles to accommodate the securing points referred to in the DoT publication 'Ro-Ro Ships Stowage and Securing of Vehicles - code of practice'. This research will have an influence on dangerous goods policy and the procedure in which such exemptions are issued for domestic ferries in the future.</p>	Completed (1996)	DSC

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	Research Project 379 - Enhanced Inspection for Gas and Chemical Carriers	<p>This project is to research data on structural failures of chemical and gas carriers, and to see if there is evidence to support the notion that the enhanced survey programme should be applied to chemical and gas carriers.</p> <p>The results from this study confirm the results of Port State Control inspections. The report will be presented to the Paris Memorandum of Understanding Committee to assist in reducing the number of inspections for these types of vessel.</p>	Completed (1996)	BLG
	Research Project 380 - The effect on shipping of the placement of offshore structures	<p>The research aims to study shipping movements around fixed and mobile offshore installations and structures, to assess the effectiveness of existing restrictions on shipping movements and to consider improvements, including the merits of new measures to reduce the risk of collisions, either between a ship or between a ship and a structure.</p> <p>The research showed that the size of the safety zone is not the issue as far as safety is concerned. What is of more importance is the awareness of the ship's navigators to the positioning of the structure and that they take timely action to avoid it. It was felt that there was merit in improving the response to infringements of safety zones.</p> <p>Other approaches to protection of mobile offshore structures were also considered.</p>	Completed (1996)	MSC

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	Research Project 381 - Safety record of pre 1986 Gas Carriers	<p>To investigate the extent of complaints by the pre 1986 gas carriers with the GC code or GC code for Existing Ships as applicable and assess their safety record identifying any trends with respects to age.</p> <p>While vigilance is required with request to all gas carriers in UK ports, the results reinforce the need to target ships built before the IGC Code entered into force (1986), particularly LNG carriers continue in service beyond 25 years and will need to be paid special attention.</p>	Completed (1996)	BLG
	Research Project 382 - To show the new pollution categories of 'noxious liquid substances' under the proposal draft new hazards profile rationale	<p>To assemble and sort approximately 30 000 pieces of database. To produce a database and computer programme for calculating the pollution categories of liquid substances transported by sea.</p> <p>TNO in partnership with Netherlands Administration are now asking for financial support to increase database to include all IBC code substances. This project has started to change opinions of IMO members about benefits and perceived drawbacks of the proposed new categorisation method, and is helping to gain support for UK and other North Sea States in their proposal for a new method of categorisation of noxious liquid substances transported in bulk.</p>	Completed (1997)	BLG

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	Research Project 383 - Formal safety assessment "Worked Example" and Methodology Development. High Speed Passenger Craft - limited hazard study	To provide the basis for development of risk based regulations. Illustrate and demonstrate, both domestically and at IMO level, all five steps of FSA applied to a suitable subject.	Completed (1997)	MSC
	Research Project 385 - Application of human factors to FSA Methodology	To provide a coherent input of human factors expertise to the individual FSA methodology development projects within the programme.	Completed (1997)	MSC
	Research Project 386 - Development of FSA step 2 Methodology (risk assessment)	The intention of the project is to review the current status of step 2 methodology, and to develop this through consideration of the interactions between specific hazards in the generic set and the causational routes that generate the overall risk of profile.	Completed (1997)	MSC
	Research Project 387 - Development of FSA step 2 Methodology (risk control options)	To develop a systematic and robust methodology for step three of FSA, i.e. deriving options for managing the risks arising from the hazards to which ships are exposed. An important part of the objective is that the step three methodology should form an integral part of the overall part of the FSA methodology.	Completed (1997)	MSC
	Research Project 388 - Development of FSA methodology (cost benefit assessment)	To develop a systematic and robust methodology for step four of FSA, i.e. cost benefit, assessment of various options for risk management and control identified in step three.	Completed (1997)	MSC

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 389 - Development of FSA methodology (decision making)	To develop a systematic and robust methodology for step five of FSA, i.e. for deciding which of the identified risk management and control options to select.	Completed (1997)	MSC
	Research Project 390 - Thermal and Physical Behaviour of Crude Oil during Transportation	To understand the thermo-physical behaviour of crude oil which creates the risk of sludge formation and to investigate the sludge/oil phase and the impact of Crude Oil Washing (COW) in its removal. Development of alternative COW techniques to overcome the problem.	08/96 -	MEPC/DE
	Research Project 394 - The limit of hydrographic survey requirements for merchant shipping	<p>To assess objectively the scope for establishing a limit of the depths for which the DoT should be responsible for hydrographic surveys for civil purposes.</p> <p>To consider within those the limits the bounds at which satellite survey technology could safely be used in favour of survey ships. To consider the cost implication of using that technology.</p> <p>An individual isobath, such as the 50m contour line, is not suitable for the purpose of delimiting the Hydrographic survey responsibilities of the DETR. However, setting a limit is possible through comprehensive consideration of user requirements and regional geography.</p>	Completed (1998)	NAV

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 396 - Exhaust Gas Monitoring - Evaluation of Equipment	In order to avoid the same type of operational and reliability problems which have been encountered with the mandatory introduction of oil contents meters the following objectives would need to be met:-  1) identification of equipment deemed to be suitable for use on board ships; and 2) assessment of the reliability, accuracy and repeatability of the chosen equipment.	Completed (1998)	DE
	Research Project 397 - Ship Specific oil cargo and bunker tagging	To confirm the practicability of the proposal and to investigate a range of available technologies.  Several technologies were confirmed to have practical application for tagging bunkers and cargo residue. A proposal for the development of a tagging standard was submitted to IMO's MEPC 40 which agreed to include the topic in the agenda for MEPC 42.	Completed (1998)	MEPC

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 398 - Reliability Assessment of Overboard Discharge Monitors (Phase 2)	<p>To investigate the effect on existing monitor designs of detergents, rust, soot vibration and temperature variation. To recommend revisions to IMO's design and test specifications.</p> <p>The project has confirmed that as regards the technical requirements, the current specification for discharge monitors is out of date. The recommendations of this project were submitted to MEPC 40, which agreed to add the review of overboard discharge monitor standards to its work programme for technical discussion at MEPC 42, in November 1998.</p>	Completed (1998)	MEPC
	Research Project 400 - Safety and Ergonomic Aspects of Software	<p>To study the human element implications of computer controlled marine radiocommunication and navigation equipment with a view to producing basic guidelines on satisfactory design such that the operational controls provide for simple, quick and effective operation with high degrees of repeatability in testing and approval.</p> <p>To study the design of software as used in safety critical applications with a view to producing general ground rules to apply to the design and testing of software used in marine radiocommunications and navigation equipment, particularly where integration with other control systems is a pre-requisite.</p>	Completed (1998)	NAV/COMSAR

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 401 - Failure of low pressure fuel systems	<p>To establish whether there is need to introduce clearer or more stringent requirements for the low pressure fuel systems of medium speed diesel engines to assure that the fuel supply pipes can withstand expected peak pressure in service. To establish the suitability of the present requirements of low pressure fuel oil supply systems to engine fuel injection pumps.</p> <p>The research identified principle causes of fuel fires including: frequent dismantling/re-assembly; high pressure pulses due to the injection pumps and vibration. The research and recommendations were submitted to IMO's FP 42 which incorporated them into draft guidelines for approval at MSC 69.</p>	Completed (1998)	FP
	Research Project 404 - FSA Trial Application	<p>The objectives of this project are: to define the likely information and data requirements for applying FSA to High Speed passenger Craft (HSC); to source and assess the available data in relation to these requirements; and to assemble the necessary data in preparation for trial application of the developed FSA methodology to this type of vessel.</p>	Completed (1998)	MSC/DE/MEPC

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 414 - Colour Vision Requirements for Seafarers	<p>To obtain an objective, independent expert opinion on the colour vision standards appropriate for UK seafarers and a recommended method of testing.</p> <p>The research concluded that normal colour vision for all deck personnel is necessary. Good colour vision is also necessary for engineering, radio and electrical personnel. Changes are needed in the way the current colour vision testing procedures employed by the MCA tests are conducted, which tests are used and how the results are interpreted. The recommendations will be assessed in the context of the wider review of medical standards being undertaken by the MCA.</p>	Completed (1998)	STW
	Research Project 415 - Determining Significant Wave Heights (SWH) for all Sea Areas around the UK Coast	<p>Assess the feasibility of defining the annual 10% exceedence of SWH in coastal waters up to 20 miles offshore for two chosen sea areas around the UK coast and to produce a SWH profile for the two selected areas.</p> <p>A SWH profile was produced which took account of the latest data and information. Phase 2 (project 422) will be undertaken to produce a full SWH profile for sea areas around the UK coast.</p>	Completed (1998)	MSC
	Research Project 418 - Sponsorship of Stability Research Lectureship	To provide the salary of a research lecturer at the Stability Research Centre at Strathclyde and therefore assist continued enhancement of damage stability research in particular the mathematical model and progress safety at sea.	08/98 -	SLF

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 420 - Investigation into the aspects of the operation of HSC on routes near land and enclosed estuaries.	Objectives:- .1 to confirm the basic wave science which produces the pressure wave; .2 to model the pressure wave effect in Belfast Lough; .3 to repeat real time events and incidents on the model; .4 to normalise the model with respect to Belfast Lough and from the normalised model produce a general model which can be used anywhere in the United Kingdom; .5 to produce recommendations, based on the normalised model, regarding speed, approach angles and critical speeds with a view to reducing the problem of wash in Belfast Lough and Loch Ryan; and .6 to test the recommendations in real time (i.e. on ships).	Completed (1998)	DE/NAV
	Research Project 422 - Determining Significant Wave Heights for all sea areas around the UK Coast - Phase 2	To determine the Significant Wave Height (SWH) for the UK coastline using the modelling techniques used in the pilot study to enable different categories of sea areas as defined within the EC Directive for Domestic Passenger Ships to be defined.  To produce a SWH map for the whole of the mainland UK and small islands off the UK coast (e.g. Scottish Isles of Northwest of Scotland), the Orkney Isles, the Shetland Isles and Isles of Scilly. The study does not need to include Isle of Man or the Channel Isles.	Completed (1998)	SLF

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 426 - The measurement of oily waste and garbage disposed of into the marine environment by shipping	<p>To establish environmental indicators to determine whether Merchant Shipping Legislation and its enforcement regarding pollution prevention is effective in reducing the amount of waste that is discharged both legally and illegally into the sea from ships, fishing vessels and pleasure craft etc. This should be achieved by seeking to establish a reliable means of measuring the annual changes in the levels of waste in the marine environment the source of which can be traced to shipping activities. Such an indicator should establish the need or otherwise to introduce new legislation, improve enforcement and additionally provide an indication of the effectiveness of North European waters being designated as a Special Area as regards Annexes I &amp; V of MARPOL 73/78.</p> <p>To produce environmental indicators that can be readily updated annually from information available in a form that can be reproduced for the new MCA annual report.</p>	Completed (1998)	MEPC
	Research Project 427 - An Investigation into the Capsize and Stability of Sailing Multihulls - Phase 2	<p>The objectives of this project are to investigate:</p> <ul style="list-style-type: none"> <li>.1 the nature of the aerodynamic forces acting;</li> <li>.2 roll responses of multihulls in waves;</li> <li>.3 the vulnerability of multihulls to pitchpole when sailing down wind;</li> <li>.4 assess the suitability of various methods of determining the vertical centre of gravity; and</li> <li>.5 quantify the variation of vulnerability to capsize in comparison with float volume.</li> </ul>	Completed (1998)	SLF

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 439a - Additional work required for the special session at MEPC 42	As a basis for this study we have obtained from Milford Haven Port Authority a copy of a FSA study that they have recently undertaken regarding marine operations in their port. Whilst it is envisaged that this study will provide a very significant input to the development of the fictitious trial application to be presented to MEPC; it is, by its very nature, a report that focuses upon port operations and not the ships (especially tankers) that use the port. We have also agreed with Milford Haven that they will not be identifiable in the case study presented at the special session. It is therefore envisaged that some additional work will be required to be undertaken to make the study complete and of relevance to MEPC delegates. The objectives of the project will be to provide a limited number of ship-related risk reduction measures that have been quantitatively assessed, to the degree necessary for this fictitious study, in terms of both their impact upon the risk levels and their financial costs and benefits.	08/98 -	MEPC
	Research Project 439b - Additional work required for the special session at MEPC 42	As above.	09/98 -	

Address for communication	Subject	Brief Outline	Commencement and Completion Date	Relevant Committee/ Sub-Committee
	Research Project 442 - FSA - Bulk Carrier Study	<p>The aim of this study is to undertake the necessary preparatory work in order that timely submissions can be made to MSC 70 regarding the UK's proposals in anticipation of a comprehensive FSA study of bulk carriers being undertaken. This will include such matters as specifying the objectives and scope of the study, defining the problem under consideration and identifying the data to be collated.</p> <p>Experience with the UK's FSA study of high speed catamaran ferries suggests that preliminary work should be started early, to provide a robust foundation for the entire study. The timely completion of this project and reporting of its results to MSC 70 will provide a basis for discussion and agreement by the Committee on the scope of the full FSA study.</p>	Completed (1998)	MSC