

QINETIQ APPLIED AND CORPORATE RESEARCH PROGRAMMES

EXPLOITATION OPPORTUNITIES FOR DOPSE, MARINE EQUIPMENT IPTS

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Introduction

This article has been produced from an annual review of QinetiQ research programmes conducted for WSA DOpsE, to identify key projects of interest to the Marine Equipment IPTs. The report from this review, is distributed to all Marine Platform and Equipment IPTs via the WSA DOpsE Requirements Manager. This article presents a summary of that report.

The report is intended to identify and encourage exploitation of QinetiQ Applied and Corporate Research by Marine Equipment IPTs. Research proposals, quarterly and final reports are reviewed to compile a catalogue of current material that has relevance to marine systems and equipment.

Research projects have been summarized in the report and grouped into themes suited to the Marine Propulsion, Electrical, Auxiliaries and Environment, Survivability and Habitability IPTs. As around 100 projects were listed in the report, it has been abbreviated to an index for this article.

With the recent changes to the management of research and the inception of the Research Acquisition Office, the old and new structures will be briefly described.

Applied and Corporate Research Programmes

The MoD has traditionally commissioned research through two main avenues, the Applied and Corporate programmes. The Applied Research Programme (ARP) supports the specific needs of individual customers, exploiting current or emergent technology. The purpose of the Corporate Research Programme (CRP) is to advance scientific and technical knowledge of key interest to defence. It also maintains and develops the defence science and technology base.

In 2001, the MoD Chief Scientific Advisor conducted a Technology Review to improve the acquisition and management of research. This led to the establishment of the Research Acquisition Organization (RAO) and development of research output streams intended to succeed ARP and CRP. The bulk of research considered in this article has been procured under existing ARP and CRP arrangements, which are discussed below in greater detail.

The ARP Customer is the Deputy Chief of Defence Staff (Equipment Capability), (DCDS(EC)), who delegates management to four Capability

Managers (CM), each of whom is responsible for a number of Capability Areas (CA).

The ARP is currently structured into 14 Packages aligned to the CAs. Packages are sub-divided into 'entities' which consist of discrete programmes or groups of smaller related programmes of work.

Changes to the structure of DCDS(EC), with the return to the MoD Main Building, have resulted in a reduction to 3 Capability Managers and 11 Capability Areas.

Each ARP package is assigned a QinetiQ Channel Manager and a MoD DSTL Technical Officer. The Technical Officer manages the direction and conduct of research and accepts the product on behalf of the MoD. The Channel Manager is the focal point for QinetiQ and liaises with Project Managers who run research programmes within each ARP package.

The Corporate Research Programme (CRP) is controlled by the Director General Research and Technology. The programme is currently structured into Technology Domains (TD), each comprising a set of Research Objectives (RO), which are sub-divided into Technical Areas (TA), containing a number of individual projects.

Each TD is managed on a day-to-day basis by a Research Director of Technology (RD(T)) acting on behalf of the Central MOD Customer. The main programme is currently contracted at TD level through the QinetiQ MoD Channel.

The CRP is split into the Directed and Inventive Programmes. The Directed Programme forms the bulk of the FY03/04 CRP (around 50-60%) and supports key themes identified by MoD as needing immediate attention. The Inventive Programme covers the remaining 30-40% of CRP, accommodating the 'blue sky' research into new technologies which have traditionally been undertaken in the CRP.

Research Acquisition

Following the Technology Review conducted by the Chief Scientific Advisor in 2001, the Defence Science and Technology Board (DSTB) was set up to develop improved strategies for the delivery of defence science and technology research outputs. The broad aim of the DSTB is to improve the exploitation from research and include it to greater advantage in forming policy. Further aims were to improve the agility of research outputs to achieve greater balance of investment, while maintaining clear high level coherence and policy direction.

A framework of seven research outputs was developed to structure research delivery and replace the ARP and CRP streams. Each output has a senior Corporate Owner, who is a member of the DSTB. Corporate Owners work with stakeholders to define the output and relative priority of the research.

The output streams, with their Corporate Owners are shown in Table.1.

TABLE.1 – *Research Output Framework*

RESEARCH OUTPUT	FUNCTION	CORPORATE OWNER
Output 1	Advice to Ministers on science and technology issues.	Chief Scientific Advisor
Output 2	Advice to policy and planning.	DSTB Policy Director
Output 3	Advice to capability management.	DCDS(EC)
Output 4	Maintaining MoD advice supplier base.	Science and Technology Director
Output 5	Technology awareness.	Science and Technology Director
Output 6	Technology/capability in the supplier base.	Defence Procurement Agency
Output 7	Innovative solutions to Defence problems.	DCDS(EC)

Existing elements of ARP and CRP are now mapped to the output structure, with traditional ARP content principally falling into Outputs 3 and 6.

The RAO comprises a team of technical, contractual and finance staff who support the Corporate Owners in translating the research output into individual research programmes. Currently forming at the Royal Military College of Science at Shrivenham, the RAO is intended to collocate dispersed elements of the MoD research organization to provide management coherence across all outputs. A single budget was created in April 2004 from existing separated areas to fund the majority of MoD science and technology research.

The RAO includes Output Managers who support the Corporate Owners by providing specialist advice in the planning and delivery of research, with the following key roles:

- Maintaining an understanding of extant and previous work.
- Advising on options for content of individual programmes.
- Maintaining knowledge of the research supplier base.
- Providing advice on methods to maximise research output, through collaboration or shared programmes across different Corporate Owners.
- Providing advice for translating Corporate plans into research programmes and contracts.
- Providing contracting and management services.
- Presenting and interpreting research output to customers.

Science based Clusters will be established to monitor every aspect of a specific technology area (e.g. materials or structures) across all the Outputs. Their role is to be similar in concept to the Technology Domains from the CRP and is intended to maximize value and avoid duplication.

The roles of the RAO and the Corporate Owners who sponsor each output stream continue to develop rapidly. The description included in this article represents a summary of the position when written, but it is considered likely that the detail will change as the structure of the RAO and Output based research develops.

Extent of research reviewed

The review for DOpsE is focussed to provide a condensed compilation of research projects for the Marine Equipment IPTs. The content is drawn from QinetiQ research projects within ARPs 1 to 13, and the CRP. Project Support and Marine Engineering Development Programme contracts are not included.

Each relevant QinetiQ research project is summarized and then compiled into a list for each of the four Marine Equipment IPTs. The project summaries include start and delivery dates, points of contact, a brief synopsis and suggested exploitation value. Due to the length of the combined summaries been replaced by an index in this article.

Conclusions

Research constitutes a significant proportion of Defence spending. It is vital for the MoD and research providers, that the product is relevant and exploited to achieve maximum value. This article and the report from which it is derived, is intended to contribute by providing a relevant compilation of research to a specific target audience.

Index of Research Exploitation Opportunities for Marine Equipment IPTs

ITEM NO.	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
1	Survivability	MESH	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Advanced FF and DC techniques and systems.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
2	Propulsion	MPS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Composite Propeller.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
3	Automation and Management	MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Concepts and processes for warship management systems.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
4	Auxiliaries	MESH	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Reduced dependency on liquid cooling.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
5	Propulsion	MLS/MPS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Advanced podded drives for warship applications.	April 2002	December 2003

ITEM NO.	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
6	Whole life cost reduction	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Strategic studies for predicting and reducing Whole Life Cost of maritime platforms.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
7	Health and environment.	MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Impact of EM fields on human health and IFEP signature implications.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
8	Platform technology	MLS/MPS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Novel energy sources and storage techniques.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
9	Auxiliaries	MESH	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Platform sustainability.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
10	Platform Technology	MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	CEPA 16 Fuel Cell report.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
11	Health and environment	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Green Warrior.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
12	Platform technology	MESH	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Dirt in warships.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
13	Platform technology	MLS/MPS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Fuel reduction technology and fuel system strategy.	April 2004	April 2006

ITEM NO.	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
14	Survivability	MESH	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Future fire fighting streaming agent study.	February 2006	March 2007
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
15	Automation and management.	MESH/MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Cost effective concepts and technologies for damage control and machinery control system.	April 2005	March 2007
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
16	Whole life cost reduction.	MPS/MXS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Underwater engineering.	April 2004	April 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
17	Platform technology.	MESH/MLS/MPS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Energy management	April 2004	April 2006
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
18	Propulsion	MPS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Pod technology risk reduction.	April 2004	April 2007
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
19	Power systems	MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Impact of large electrical power systems in the RN.	December 2003	April 2004
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
20	Power systems	MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Electro magnetic fields.	April 2004	December 2007
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
21	Power systems	MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Detailed power system earthing and shielding study (including podded drives and ICCP systems).	April 2004	April 2005

ITEM NO.	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
22	Power systems	MESH/MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Damage control for HV systems.	April 2004	April 2005
23	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Automation and Management	MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Cost effective combat systems.	April 2004	April 2007
24	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Health and Environment	MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Human health effects of IFEP power systems.	April 2004	April 2007
25	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Platform technology.	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	CESIL.	April 2004	April 2007
26	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Platform technology	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Shades of grey.	December 2003	March 2005
27	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Miscellaneous	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Adaptability for FSC novel stern.	March 2006	April 2007
28	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Platform technology	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Maritime platform characteristics.	December 2003	April 2004
29	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Platform technology	MESH	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Drudgery countermeasures.	April 2005	April 2007
30	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Platform technology	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Aluminium as an alternative to steel for ship construction.	April 2005	April 2006

ITEM NO.	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
31	Whole life cost reduction	MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Technology based alternative manning concepts.	April 2004	April 2007
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
32	Whole life cost reduction	MESH/MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Complement reduction, technology to support minimal size FF and DC organization.	April 2004	April 2006
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
33	Whole life cost reduction	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Cost reduction, the platform perspective.	April 2004	April 2007
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
34	Health and Environment	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Legislation, and its impact on the RN's ability to operate globally.	April 2004	April 2007
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
35	Platform technology	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Exploitation of commercial ship repair and platform technology.	April 2005	April 2006
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
36	Miscellaneous	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	FSC propulsion and auxiliary.	December 2003	April 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
37	Propulsion	MLS/MPS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Pumpjet and waterjet application in warships.	March 2005	April 2006
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
38	Ship/air integration	MLS/MXS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Marine landing systems.	April 2002	December 2003

ITEM NO.	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
39	Ship/air integration	MLS / MXS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Maritime UAV.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
40	Ship/air integration	MLS / MXS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Personal communications.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
41	Ship/air integration	MLS/MXS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Entry level recovery systems.	April 2004	August 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
42	Platform technology	MLS	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Evaluation of technologies and techniques for Combat Management System Human Machine Interface.	April 2002	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
43	Platform technology	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Optimized complements based on NOMISETS.	April 2002	March 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
44	Platform technology	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Federated confederated and ship alongside training.	April 2002	January 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
45	Trimaran	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Trimaran.	April 2002	March 2004
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
46	Survivability	MESH	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Blast suppression using water.	February 2002	April 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
47	Survivability	MESH	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	CVF vulnerability issues.	February 2002	March 2003

ITEM NO	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
48	Survivability	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Destroyer grade scheme report.	February 2002	November 2002
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
49	Survivability	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Post hit ship and systems survivability.	February 2002	May 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
50	Survivability	MESH	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Post hit ship recovery fire damage and spread assessment.	February 2002	October 2002
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
51	Survivability	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	FSC Initial gate vulnerability input.	February 2002	May 2002
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
52	Survivability	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Generic warship and crew issues (presentation).	February 2002	December 2002
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
53	Survivability	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	RFA survivability in littoral operations.	February 2002	March 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
54	Survivability	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Whipping code demonstration.	February 2002	September 2002
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
55	Whole life cost reduction	General	ARP 01 AWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	AWB cost reduction.	January 2004	April 2004
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
56	Automation and management	MLS	ARP 02 UWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Hybrid photonic processing techniques.	April 2002	June 2005

ITEM NO	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
57	Whole life cost reduction	General	ARP 02 UWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	UW platforms cost reduction.	April 2002	October 2002
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
58	Health and Environment	MESH	ARP 02 UWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Life support.	April 2002	February 2004
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
59	Auxiliaries	MXS	ARP 02 UWB
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Underwater mobility.	April 2002	January 2004
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
60	Auxiliaries	MESH/MXS	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Alternative amphibious platform offload procedures.	April 2003	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
61	Auxiliaries	MESH/MXS	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Contribution to littoral manoeuvre, sea based logistics and OOTW of commercially available containerisation and transport techniques.	April 2003	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
62	Platform technologies	General	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Corrosion reduction techniques.	April 2002	April 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
63	Whole life cost reduction	General	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Design options for LPD(R).	April 2004	December 2004
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
64	Whole life cost reduction	General	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Identification of cost drivers and cost reduction concepts for DEC (DSR).	April 2002	April 2005

ITEM NO	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
65	Trimaran	General	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Trimaran concepts for DSR.	April 2003	December 2003
66	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Health and environment	General	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	The impact of emergent and future maritime legislation on DSR and ALM.	November 2003	April 2004
67	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Auxiliaries	MESH / MXS	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	New techniques for RAS.	April 2002	December 2002
68	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Misc	General	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Hovercraft technology.	November 2003	March 2004
69	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Whole life cost reduction.	General	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Design options for LPH.	April 2003	December 2003
70	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Auxiliaries	MESH/MXS	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	New techniques for amphibious offload.	April 2004	December 2004
71	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Miscellaneous	General	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	PACSCAT design.	April 2002	December 2002
72	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Platform technology	General	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Shock reduction for DSR.	August 2002	January 2003
73	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
	Platform technology	General	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Signature reduction techniques for DSR maritime platforms.	September 2002	January 2003

ITEM NO	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
74	Auxiliaries	MESH	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Production of water from air.	August 2002	January 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
75	Auxiliaries	MESH	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Development of a technology that will allow the production of potable water from vehicle exhaust.	August 2002	January 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
76	Auxiliaries	MESH / MXS	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Development of in dock wave reduction techniques.	April 2003	December 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
77	Automation and management	MLS	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Platform availability	January 2004	April 2004
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
78	Platform technology	General	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	LPH SLEP.	January 2004	April 2004
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
79	Ship/air integration	MESH / MLS	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	MARS DSR Ship air interface	January 2004	April 2004
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
80	Ship/air integration	MESH / MLS	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Deployable hangars.	January 2004	April 2004
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
81	Whole life cost reduction	MESH / MXS	ARP 03 DSR
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	DSR cost reduction studies.	January 2004	April 2004
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
82	Propulsion	MPS	ARP 04 DS
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Gas turbine technology.	April 2002	January 2003

ITEM NO	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
83	Propulsion	MPS	ARP 04 DS
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Assessment of the impact of control concepts in engine life usage.	April 2002	February 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
84	Power systems	MLS	ARP 05 CTA
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Status report of More Electric Aircraft Programmes.	April 2002	January 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
85	Platform technology	MPS	ARP 05 CTA
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Structural integrity and engine lifing.	March 2002	February 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
86	Power systems	MLS	ARP 06 CSS
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Powertrain and wheels.	April 2002	April 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
87	Automation and management	MLS	CRP
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Built for life electronics concept assessment and development.	April 2002	April 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
88	Power systems	MLS	CRP
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Silicon carbide electronics for high temperature power.	April 2002	June 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
89	Power systems	MLS	CRP
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Radiation effects in COTS microelectronics.	April 2002	April 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
90	Platform technology	General	CRP
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Novel sandwich structures.	July 2003	February 2006

ITEM NO	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
91	Platform technology	General	CRP
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Unconventional control of marine fouling.	May 2002	April 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
92	Automation and Management	MLS	CRP
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Building trust in military command and information systems.	April 2002	October 2004
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
93	Propulsion	MPS	CRP
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Gas turbine core reconfiguration for constant volume combustion.	April 2002	November 2003
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
94	Propulsion	MPS	CRP
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Very highly loaded gas turbine compressors.	April 2002	July 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
95	Health and Environment	General	CRP
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Disposal and recycling of polymer composites.	May 2002	April 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
96	Platform technology	General	CRP
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Structural design for reliability.	April 2002	April 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
97	Platform technology	General	CRP
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	An expert system for moisture uptake prediction and degradation effects in composite materials and structures.	April 2002	December 2005
	RESEARCH THEME	IPT APPLICABILITY	RESEARCH AREA
98	Platform technology	General	CRP
	PROJECT TITLE	PROJECT START DATE	PROJECT FINISH DATE
	Graded compliant coatings for drag reduction.	April 2002	April 2005