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Sixteenth International Research Ship Operators Meeting
18 - 19 September 2002, Helsinki, Finland

Attendees

Country	Representative	Organisation
Australia	Mr. Geoff Dannock	AAD, Kingston
	Dr. Andrew Forbes	CSIRO, Hobart
	Mr. Jonathan Reeve	AAD, Kingston
Belgium	Mr. Andre Pollentier	MUMM, Oostende
Denmark	Cpt. Frode R. Larsen	DFU, Copenhagen
EU	Mr. Gilles Ollier	CEC-DG XII, Brussels
Finland	Ms. Eila Lahdes	FIMR, Helsinki, Chair
	Prof. Pentti Mälkki	FIMR, Helsinki
	Mr. Hannu Grönvall	FIMR, Helsinki
	Mr. Henrik Sandler	FIMR, Helsinki
	Ms. Eija Vuorinen	FIMR, Helsinki
	Mr. Jorma Kämäräinen	FMA, Helsinki
	Prof. Kaj Riska	HUT, Helsinki
France	Mr. Jean-Xavier Castrec	IFREMER, Brest
Germany	Prof. Gerhard Kortum	IMUK, Kiel
	Mr. Falk von Seck	RF, Bremen
India	Mr. G. Janakiraman	NIOT, Chennai
Ireland	Mr. Conor Mowlds	Marine Institute, Galway
Japan	Mr. Masato Chijiya	JAMSTEC, Yokosuka
	Dr. Hiroyasu Momma	JAMSTEC, Yokosuka
	Cpt. Akio Nakagawa	GODI, Yokosuka
	Cpt. Masataka Zaitsu	NME, Yokosuka
Netherlands	Ms. Marieke J. Rietveld	NIOZ, Texel –Secretary
	Prof. Alfred Soons	NILOS, Utrecht University
New Zealand	Mr. Clive Glover	NIWA, Wellington
	Mr. Fred Smits	NIWA, Wellington
Norway	Mr. Per Nieuwejaar	IMR, Bergen
Russia	Mr. Mikhail J. Romanov	INTAARI, St. Petersburg
	Mr. Alexey V. Turchin	INTAARI, St. Petersburg
South Africa	Mr. Eric Walker	Smit Pentow Marine, Cape Town
Spain	Dr. Juanjo Dañobeitia	CCIC/UTM, Barcelona
UK	Mr. Edward Cooper	SOC/ Southampton
	Mr. Paul Stone	SOC/RSU, Southampton
	Dr. Mike Webb	NERC, Swindon
	Mr. Geraint West	SOC/UKORS. Southampton
	Mr. George Angas	VT Ocean Services, Southampton
UK-Scotland	Mr. John Morrison	SEERAD, Aberdeen
USA	Ms. Dolly Dieter	NSF, Arlington
	Mr. John Freitag	ONR, Arlington
	Prof. Dennis Nixon	URI, Kingston
	Ms. Elizabeth Tirpak	Dept. of State, Washington D.C.
	Commander Elizabeth White	NOAA, Silver Springs
	Mr. Douglas White	OCEANIC, Delaware

Apologies for absence

Canada	Mr. Steve Peck	DFO-CCG, Ottawa
Chile	Mr. Enrique Aranda	IFOP, Valparaíso
Germany	Dr. Dieter Strohm	RF, Bremen
Eurocean	Mr. Laurent d'Ozouville	Eurocean, Lisbon
France	Cpt. Armel Le Strat	GENAVIR, Paris
Italy	Cpt. Massimiliano di Bitetto	IGM-CNR, Sardinia
Japan	Mr. Masatake Okawara	NME, Yokosuka
NATO	Dr. Ian Sage	NATO, Ispra – La Spezia
Spain	Mr. José I. Díaz	CSIC-UTM, Barcelona
Sweden	Cpt. Per.O. Bengtson	U/F ARGOS, Gothenburg

1. Welcome

Prof. Pentti Mälkki, Director of FIMR (Finnish Institute for Marine Research) welcomed all 40 participants from 17 different nations to the sixteenth ISO-Meeting. He recalled that ISOM had started with 9 nations, including Finland, and that he was happy that after all these years Finland was able to host the yearly meeting of this flourishing group.
Ms. Eila Lahdes, Chairperson of this year's ISOM remarked to be pleased to see so many old friends as well as so many new faces, and called the meeting to order.
Ms. Marieke Rietveld (Netherlands), as Secretary of ISOM, brought forward the apologies for absence of a number of members. Some had submitted a written report. These reports will be brought forward during the meeting and will be incorporated in the minutes. *Ms. Lahdes* invited all participants to briefly introduce themselves.

2. Review of Minutes of fifteenth Meeting

The minutes were accepted as a true record of the fifteenth meeting held in Hobart, Australia, 19 - 20 September 2001. The final version of the minutes has been made available on the ISOM web site (http://www.nioz.nl/isom/) and OCEANIC (http://www.researchvessels.org)

3. Delegates Reports of Activities

3.1. Fleet Activities and Changes (incl. major facilities)

Mr. Jon Reeve (AAD - Australia) reported on the fleet activities of AURORA AUSTRALIS. Her major marine science voyage for 2001/02 season involved 70 scientists representing 12 nationalities. Demands included the connection, testing and use of 14 laboratory containers from 29 October – 13 December, 2001. The principal objectives of the voyage were to conduct oceanographic and biological investigations along the SR3 transect between Tasmania and Antarctica and to undertake physical and biological studies on the sea-ice.
In the 2002/2003 Antarctic summer the AAD will conduct an early summer program undertaking sea-ice and iceberg programs off the Antarctic coast at about 145 degree E. It will also conduct a major Antarctic Marine Living Resources (AMLR) program off the Antarctic Mawson coast, later in the summer.
As in previous years the AURORA AUSTRALIS will continue to gather and store oceanographic data during all its voyages in 2002/2003. Both programs major programs will also be supported by a newly installed TerraScan system, new multiple opening zooplankton trawls, benthic sleds and benthic video systems on the AURORA AUSTRALIS.
Our purpose at ISOM is to share our experience, renew our ties with other nations and expand our knowledge of other nation's activities. We are in the throes of searching for a new cargo ship, and will shortly begin another quest to replace our science ship after the 2004/2005 Antarctic season. The reason we mention both is that we hope to provide our researchers with the most flexible arrangement using modern ship and aircraft resources. We are interested in moving to a marine science ship that can carry a range of modular laboratory containers that are better able to support our future changing activities. *Mr. Reeve* would be happy to receive input from colleagues on the design to avoid problems from the past.
The AAD plans to commence operation of flights between Hobart, Tasmania and Casey in the Antarctic in 2004/2005 using a Falcon 900EX aircraft, and to introduce a new science ship in 2005/2006. With an ability to move personnel along the Antarctic coast using CASA 212 aircraft and helicopters we may be able to deliver marine scientists to our ship already positioned in or near our areas of scientific interest, and therefore reduce their sometimes very long and expensive transit time to the Antarctic.
The AAD has recently achieved accreditation under ISO 14001 for Environmental Systems Management. Accreditation included an inspection audit of the AURORA AUSTRALIS.

Dr. Andrew Forbes (CSIRO - Australia) gave a short introduction on CSIRO in Hobart. The Australian oceans within its EEZ all around the continent are vast. CSIRO has an annual budget through the Division of Marine Research (CMR):of AU$35M (AU$23M appropriation, AU$12M external). The budget for the National Facility is AU$5.8M (R/V SURVEYOR), and has stopped for the R/V FRANKLIN, that has been decommissioned. The number of staff for research is 330; for the National Facility: 10 (tech support), and 14-17 (marine crew).
Upgrades of R/V SOUTHERN SURVEYOR (60 m) are: replacement of the fixed stern gantry with a moveable 12m/12tonne A Frame; replacing the aft crane with a 8 ton crane (with 12m reach). This will allow us to load/unload large items ourselves such as containers, which has been a problem in some countries. We are also replacing the CTD winches and handling system to 8mm x 8Km; and we will transfer he oceanographic instrumentation from R/V FRANKLIN; Further we will reclaim a ballast tank for additional fuel endurance.
The R/V FRANKLIN (55m) is now cold stacked and awaiting sale.
Further details on CMR and its vessels are available from: www.marine.csiro.au

Mr. André Pollentier (Belgium) reported on the activity of R/V BELGICA operated by MUMM - Royal Belgian Institute of Natural Sciences - Belgian Federal Office for Scientific, Technical and Cultural Affairs. The R/V Belgica 2002 programme is fully occupied by some 32 cruises conducted mainly in the Southern Bight of the North Sea and the English Channel (9 geological research, 6 fisheries research, 10 environmental monitoring, 10 biological and chemical research programs). One geological research cruise, combined with a study on biodiversity, has been conducted in the Porcupine Basin and Gulf of Cadiz . During this cruise research was done on the carbonate coral reefs in the framework of a Belgian program with the partnership of the GEOMOUND, ECOMOUND, ACES and DEEP-BUG projects and in preparation of the deep sea-drilling program "ODP". A second program mainly

aiming at studying CO2 and Calcium cycle has taken place on the French, UK and Irish continental shelf .

From *Mr. Steve Peck (DFO - Canada)* a written report was received and though he was unable to attend this year, he really thinks that Canada should attend the next ISOM. He will emphasize the need within his organization.
In 2001, the Canadian Coast Guard operated a total of 110 vessels in support of the Department of Fisheries and Oceans' (DFO) Icebreaking, Marine Navigational Aids, Search and Rescue, Fisheries Conservation and Protection, and Science programs.
Scientific support extends to other government departments with marine or freshwater research programs, such as Natural Resources Canada (marine geology) and Environment Canada (limnology and atmospheric science), and Canadian universities with established marine and limnological research programs.
Our fiscal year begins on April 1, so the following table covers the periods 1 April 2001 to 31 March, 2002 (Delivered Days) and 1 April, 2002 to 31 March, 2003 (Planned). The ships are divided into Large (i.e. Watch keeping) and Small (i.e. Day Boats), and by discipline supported:

Table 1:Sea Days and Number of Vessels, by Ship Type and Discipline Supported

Discipline	2001-02 (Actual)		2002-03 (Plan)	
	Large	Small	Large	Small
Fisheries Research	842	1434	963	1818
	4	8	4	9
Oceanographic Research	753		1000	
	4		4	
Hydrographic Surveys	156	709	214	631
	1	4	1	3
Icebreakers etc	139		99	
	3		4	
Arctic Surveys	60		159	
	1		2	
Totals	**1950**	**2143**	**2435**	**2449**
	13	**12**	**15**	**12**

Thus, in FY 01/02, 842 days were delivered by our four large research trawlers and a further 1,434 by eight small trawlers. The total delivered days in FY 01/02 was 4,093 on 24 vessels, and our plan for the current fiscal year is 4,884 on 27 ships.
By comparison, in FY 00/01 we delivered a total of 4,261 days on 24 vessels.
Our emphasis in future international collaboration has shifted from traditional blue-water oceanography to Arctic marine research, as described in the following section.

The Icebreaker CCGS SIR JOHN FRANKLIN and Arctic Marine Research
The Canadian Coast Guard is very pleased to have been able to work out an arrangement with the Canadian Funds for Innovation through Laval University in Québec City to recommission the CCGS SIR JOHN FRANKLIN, one of our four medium icebreakers. In exchange for a significant contribution of funds towards a major refit to bring the ship back into classification, the Canadian Coast Guard will manage and operate the ship and make it available six months annually to support marine research in the Arctic. For the remaining six months (winter), the FRANKLIN will be based in Québec City with her two sister ships DES GROSEILLIERS and PIERRE RADISSON, from where she will take up icebreaking escort and flood-control duties in the St. Lawrence River and estuary.
Until now, while the Coast Guard has endeavored to accommodate the needs of the scientists and to be a reliable partner in arctic marine research, providing an icebreaker to support a large international project invariably created havoc in the CCG's operational schedule. A suitable ship had to be identified, freed from its normal Arctic operational deployment obligations, replaced by another ship, and mobilized for science. Scientific equipment had to be assembled from all over Canada and fitted to the ship, and similar efforts had to be deployed to de-mobilize the ship afterwards.
However, the combination of reduced operating budgets and mild ice conditions in the St. Lawrence River and Gulf (winter) and in the Arctic (summer) provided the Coast Guard with the flexibility to free up one or two icebreakers for periods of time coinciding with the requirements of the science projects. Thus, during the period October 1997 through September 1999, CCG supported SHEBA (Surface Heat Budget of the Arctic Ocean), NOW (North Water Project) and Tundra Northwest 99.

The reactivation of the FRANKLIN and this long-term arrangement with the Canadian Arctic scientific community provides the latter with the guaranteed availability of a dedicated platform equipped with state-of-the-art instrumentation which will allow researchers to:

1. Plan projects over an horizon of 3-5 years, a necessary condition for large international efforts;
2. Reduce effort and funds spent on repeated mobilization/demobilization;
3. Develop an international market for the joint use of the ship and management infrastructure;
4. Develop and maintain the special links with the officers and crew necessary to optimize the support of scientific operations; and
5. Increase reciprocal access for Canadian researchers to international projects led by other countries.

The icebreaker's first Arctic science mission will be to support the international Canadian Arctic Shelf Exchange Study (CASES). This project, scheduled to commence in 2003, brings together researchers from Canada and ten other countries (United States, Japan, United Kingdom, Denmark, Russia, Poland, Norway, Spain, Belgium and Australia).
The central objective of CASES is to understand and model the response of biogeochemical and ecological cycles to atmospheric, oceanic and continental forcing of sea-ice cover variability on the Mackenzie Shelf. The planned field program will provide a three-year interannual comparison of ecosystem maturation in response to the variability of sea ice cover. It will also be, for the first time ever, a year-round, highly integrated multidisciplinary study of an arctic shelf ecosystem, including a segment of the circum-arctic flaw polynya system.

Mr. Frode Larsen (Denmark) reported on the activities of the Danish R/V DANA that is operated by the Danish

Institute for Fisheries Research (DIFRES). DIFRES is a research institution which carries out research, investigations and provides advice concerning sustainable exploitation of live marine and fresh water resources. DIFRES is dependent on good research vessels. The institution currently has five ships:

- DANA. 79 m ocean-going research vessel
- Havfisken. 13 m cutter (wood)
- Havkatten. 9.6 m cutter (fibre glass)
- Havmusen. 6 m aluminum dinghy.
- Havtasken. 5 m fibre-glass dinghy.

DANA is a large, efficient vessel, capable of performing a wide range of research tasks. The ship is equipped with several separate laboratories, and is able to accommodate a large number of scientists, allowing for different tasks to be carried out during surveys. DANA is able to carry out research work in all open waters, even under bad weather conditions or in ice filled waters.

However, the ship has two shortcomings; its draught is too deep for Danish coastal waters, and operation costs are comparatively high. Furthermore, the increasing fuel-oil prices in 2001 contributed to a high operation cost per day at sea.

As also recommended by the Danish Research Council, DIFRES will seek to expand cooperation with the Danish Universities and other Danish and foreign institutions to seek an agreement for operations of DANA in the future.

In the period 1995-2000, DIFRES was able to charter out DANA for about 35-40 days per year. 2001 differed markedly, however, since DANA was only chartered out for two days. The low charter activity will apparently continue in 2002. Therefore, DIFRES will seek to expand cooperation with the Danish Universities and other Danish and foreign institutions to seek an agreement for operations of DANA in the future.

In 2001, DANA received extensive maintenance work; among other things, scheduled works on the auxiliaries and major repairs of the trawl winches. As required by Danish law, the HALON fire fighting system was replaced with a new INERGEN system (commenced in 2000, completed in 2001). In addition, a new working deck was fitted for operation of TRIAXUS, a programmable undulating towed body.

DANA completed a total of 164 survey days for DIFRES in 2001, of these 146 at sea, and 2 survey days for other Danish institutions. The DANA surveys took place in the North Sea, Skagerrak, Kattegat and in the Baltic Sea.

Ms. Eila Lahdes (Finland) reported on R/V ARANDA operated by FIMR. During her 14th year, 2002, R/V Aranda completed 12 scientific cruises. The research area covered the Baltic Sea and the Fram Strait, in all 418 stations and 1947 working days. The cruise programme included the annual monitoring of the environmental state of the Baltic Sea, cruises on zoobenthos, sediment biogeochemistry, biodiversity of plankton communities, wave measurements and CO2-exchange in the Baltic Sea. In the Fram Strait air-sea ice-sea interactions were studied. During the stay in the Greenland Sea the vessel was chartered by the University of Hamburg for 40 days.

In addition, short cruises for the testing of the equipment and presentation of the vessel were arranged. In April Finnish Centre of Metrology and Accreditation performed the annual auditing visit where sampling methods and handling of the samples on board of the vessel were again evaluated. This procedure belongs to the requirements of the Accreditation Certificate of our institute according to SFS-EN ISO/IEC 17025.

Mr. Jean-Xavier Castrec (France – IFREMER) reported on operations of Ifremer four open-sea vessels : R/V's L'Atalante, Nadir, Le Suroit and Thalassa and major facilities : Nautile, Rov Victor 6000. There have been no changes in the fleet, apart from standard technical reviews, and ISM certification of the four open-sea vessels.

The third major overhaul of the manned submersible Nautile was completed in March 2002 (total duration around 18 months). The trial cruise in April 2002 was successful and allowed to validate the important changes.

For Rov/Victor 6000, 2002 was a fully operational year despite cable replacement.

New vessel :

Talks on the deep-sea exploration vessel and hydro-oceanographic ship began in 1998 between the Ministries respectively in charge of research and defense led to the launching of a programme for two hydro-oceanographic vessels to replace l'Esperance, D'Entrecastreaux and Nadir.

The hydrographic ship will be called Beautemps-Beaupré. She has been designed and ordered by the French Navy. The main contractor is the Ministry of Defense. She will be delivered late 2003, after trials mid-2003. The Beautemps-Beaupré is directly inspired by Ifremer's Thalassa.

As for the deep-sea exploration vessel, Pourquoi-Pas ?, she will be built with Ifremer as the main contractor, in association with the French Navy. A European call for proposal has been launched for her construction and she should be available to scientific teams late 2004/beginning 2005. This open-sea vessel will be devoted to implementing underwater vehicles (Victor 6000 and Nautile) and to carrying out general oceanographic cruises (geosciences, physical, chemical and biological oceanography) and hydrographic studies.

R/V Nadir will be struck off the fleet at the end 2003.

Cruises : Throughout 2002, Ifremer will be running 43 cruises on the four open-sea vessels with disciplines roughly divided as follows : 11 geology, 4 physical and biology, 8 fisheries, 11 technology and equipment trials.

Among these cruises we will be running :

- one cruise for our Spanish partner of IEO (Instituto Espanol de Oceanografia) according to the Thalassa's agreement,
- 2 cruises for our German partner of IFM Kiel (Institute Fur Meereskunde an der Universität Kiel) according to our tripartite agreement,
- 2 charters,
- 3 for scientific co-operation and one half/charter half/ship-time exchange with our Portuguese partner FCUL (Fac. Ciencas Univ. Lisboa).

2002 will have seen R/V L'Atalante operating for 12 months from the Caribbean to the east Pacific and back to the Mediterranean, R/V Nadir for 6 months in the Atlantic and Mediterranean, R/V Le Suroit for 10 months in the same seas as R/V Nadir and R/V Thalassa for 10 months in the Atlantic and North sea.

Prof. Gerhard Kortum (Germany – IfM) informed ISOM that as off 1 January 2004 The IfM (Institute for Marine Science) in Kiel would merge with the Hamburg institute to one organization. Also IfM will work closely together with the Marine Geosciences Research Centre GEOMAR in Kiel. From a new scienceplan the need came forward to replace the medium sized R/V ALEXANDER VON HUMBOLDT. The new vessel should be ice strenghtened to work on the ice edge in the Arctic in summer. The new ship will take over the work of R/V POSEIDON and R/V METEOR in the Labrador Sea. The name of the new ship will be Maria Sibylla MERIAN, after the famous painter and botanist (1699-1702). The ship is planned to be operational at the end of 2004.
The cruise schedules of the German RV's were presented as a hand-out.
Mr. Falk von Seck (Germany – RF) introduced himself to ISOM. He is the successor of Dr. Dieter Strohm and colleague of Cpt. Caspar Von Spee of the Reederei Forschungsgemeinschaft GmbH. RF runs many of the RVs of Germany, and is the owner of R/V SONNE. There have been some organisational changes within the RF, and Mr. Von Seck brought new PR material for distribution.

Mr. G. Jamakiraman (India – NIOT) was happy to attend the ISOM for the first time as a new member. He introduced the National Institute of Ocean Technology (NIOT) that was founded by the Department of Ocean Development (DOD) at the end of 1993 and is based in Chennai. The mission of NIOT is to develop world-class technologies and applications for sustainable utilization of ocean resources, and to provide competitive, value added technical services to organizations working in the oceanic field, and also to develop a knowledge base and institutional capabilities in India for management of ocean resources and environment.
The major projects are the Ocean Thermal Energy Conversion (OTEC) and the generation of Wave Energy; Under water technology and crawler based ocean mining.
NIOT has four technology groups for Engineering & Design, Coastal and Environmental Engineering, Marine Archeology and Marine Instrumentation. Three operational groups are for Management, the National Data Buoy Programme (NDBP) and Ocean Science & Technology for Islands, to help island communities with helping to develop a technology for fattening of lobsters and crabs.
The NDBP now has 12 buoys deployed. Plans are to deploy 40 buoys in 2003. There are two types, shallow water SW and deep water DW
Research vessels are the SAGAR PURVI, SAGAR PASCHIMI for coastal research. The OTEC barge SAGAR SHAKTHI with retractable tower (LOA 72 m, width 16 m, 3 moon pools); the ocean and Antarctic R/V SAGAR SAMPADA (fisheries) and the multipurpose RV SAGAR KANYA (LOA 100 m, width 16.4 m).
Plans are to replace the 20 y old SAGAR KANYA. This will take 3 – 4 years. The planning starts within a few months. *Mr. Jamakiraman* emphasized that he saw great advantage to learn from the experience of the ISOM members an would welcome any good advice.

Mr. Conor Mowlds (Ireland) told that it has been a challenging year for Ireland with the building of the new 65 m deep sea multipurpose R/V CELTIC EXPLORER. The ship is built at Damen Shipyards: the keel has been laid in Romania, and the fitting takes place in the Netherlands. Delivery is scheduled for December.
The 31 m R/V CELTIC VOYAGER is in her 5th year of operation, and cruised for 218 days, spread over 25 scientific programmes, including fisheries, geophysics, environmental research, student training, buoy recovery and deployment and the National Seabed Survey. The latter is a co-operative project with the Geological Survey of Ireland. For the project new equipment was installed, including a hull mounted sub-bottom profiler and a Seapath 200 positioning system.
With the National Data Buoy Network of the Irish and UK Met Offices, real time date is provided on wind, wave and weather conditions. The Network was extended this year with a third buoy on the Irish South coast. Along with the first two stations deployed on the West and East coasts, the Network provides mariners with up to date weather information through reports broadcast five times a day by the coastal radio stations. Observations are also available on the websites of the Marine Institute, the Met UK and the Met Eireann.
New developments were the design, development and installation of a Data Acquisition System (DAS) and 'on line' ship to shore Survey Data Management System (SDMS) for the VOYAGER and the EXPLORER. The system was developed 'in house' by the Marine Institutes Data Centre in close consultation with the RV Operations department and vessel users. The SDMS will support the flow and exchange of information from the allocation of ship time through to the submission of the cruise report.

Mr. Hiroyasu Momma of JAMSTEC (Japan) gave an introduction on the Japanese research fleet of JAMSTEC. There are five research vessels, NATSUSHIMA, KAIYO, KAIREI, and YOKOSUKA, operated by NME, and MIRAI, operated by GODI. They each sail for approx. 300 days per fiscal year (April – March). JAMSTEC also has the manned submersibles SHINKAI 2000 and SHINKAI 6500, and the ROVs DOLPHIN-3K, KAIKO and HYPER-DOLPHIN and UROV-7K and the DEEP TOW, and bore-hole reentry and observation system BENKEI. Further there is the development of the AUV URASHIMA. The URASHIMA completed a successful test by cruising for 132.5 km through the Suruga Bay trough.
Early this year SHINKAI 6500 dived in the Indian Ocean, and this summer around Hawaii, in a collaborative project with the USA. There it completed its 700th dive at 4500 m.
At the end of 2002 SHINKAI 2000 and DOLPHIN-3K will be decommissioned.
For the TRITON buoy project 18 sets of TRITON buoys were deployed in the West Equatorial Pacific.

Cpt. Masataka Zaitsu of NME (Japan) reported in detail on the JAMSTEC fleet activities of vessels operated by NME in the fiscal year 2002 (April 2002 – March 2003). Nippon Marine Enterprises manages the operation of four research vessels. There were no major changes of the vessels.
The support vessel R/V NATSUSHIMA has been involved in Diving Research Activities using Submersible "SHINKAI 2000" and ROV DOLPHIN-3K around

Okinawa, Kagoshima and other Japan Pacific Ocean side coast areas.
R/V KAIYO has mainly conducted cruises for ROV HYPER DOLPHIN in Sagami-Bay and Off of Sanriku where is North coast of Pacific Ocean side of Japan mainland.
The support vessel R/V YOKOSUKA has been involved in Research Activities with Submersible "SHINKAI 6500" and Trial Cruise of AUV URASHIMA.
Diving Researches of SHINKAI 6500 were conducted at Chishima-Trench where is South East off of Hokkaido, Nankai-Trough where is off of mid coast of Pacific Ocean side of Japan mainland and around Hawaii Islands. From end of this month, YOKOSUKA is scheduled to go to Indonesian coast for SHINKAI 6500 diving activity at Jawa-Sunda Trench.
Trial activity of AUV URASHIMA were carried out at Suruga Bay. In this trail, she succeeded to run continuously more than 100km using a Lithium Ion Battery. JAMSTEC is aiming her 300km nonstop running as the next stage.
R/V KAIREI has been involved in Multi Channel Seismic Survey activity and ROV KAIKO's Diving researches around Japan. From October, she is supposed to go to West Philippine Sea and Mariana Trench for Diving Research of ROV KAIKO.
No major change up to now. However, SHINKAI 2000 will be laid-up after completion of her diving cruise in end of November this year. She will be put in the maintenance station in JAMSTEC. DOLPHIN-3K is supposed to complete her duty and retire at the end of November this year. SHINKAI 2000 has carried out 1390 dives for 20 years, and it is expected to be 1413 dives finally at the end of November. DOLPHIN-3K has conducted good jobs in not only scientific research work but also investigation mission for sunken vessels and objects. Their support vessel NATSUSHIMA will still remain an active player after this as a research vessel
The Operations Schedule of the fiscal year 2002 of the research fleet was made available as a hand-out.

Cpt .Akio Nakagawa of GODI (Japan) reported on the large size oceanographic research ship MIRAI that is managed by GODI. MIRAI's activity area is the North Pacific (from Equatorial up to high latitude) and the Indian Ocean. R/V MIRAI is scheduled for five cruises in 2002 and the first two of them have been finished so far and the last 3 coming. MIRAI is to be at sea for 291 days in this year.
Research on the Sub-Tropical and Sub-Arctic gyres in the North Pacific Tropical Ocean Climate Study (Western Pacific and Eastern Indian Ocean); Arctic Ocean Research in co-operation with the Canadian Coast Guard Ice-Breaker 'LOUIS ST LAURENT' and 'LAURIER'; Air Sea Interaction Research in the Tropics (the Pacific); Observation Study on the Material Cycle in the North Pacific.
In the Tropical Ocean Climate Study cruise of this year, MIRAI achieved deployment of TRITON array of 18 buoys in the western Pacific and eastern Indian Ocean.
TRITON : TRIangle Trans-Ocean buoy Network: Surface meteorology and upper ocean observing buoy network for better understanding El Niño/Southern Oscillation, Asian Monsoon and Decadal scale Oceanic Variations.

Ms. Marieke Rietveld (Netherlands) reported on the operations of the multi purpose R/V PELAGIA.
After motor overhaul and maintenance in January 2002 (5 weeks), PELAGIA sailed for a cruise programme of 285 days (44 weeks), mainly in the North Sea, North Atlantic Ocean and West Mediterranean. Projects funded by the Dutch national programme of the Netherlands Research Council NWO, and for the EU programmes IRONAGES, ECOMOUND/ GEOMOUND and STRATAFORM/ CANYONS. Also for a 3 week charter by Thales (France) for sonar trials in July/August. No problems with diplomatic clearance were encountered, except with France for the Thales cruise that was co-ordinated by the French Navy. This was resolved in time.
For 2003, R/V PELAGIA will cruise mostly in the same areas.
Major equipment/changes: A new deep sea winch (Kley France) and cable (high performance fiber with conductors) has been constructed and successfully tested. Operational since Spring 2002. The moveable lander (MOVE!) is under construction. The construction of a new XRF Containerized Core Scanner (CORTEX) has been completed. A second CTD-system (Seabird CTD underwater unit in titanium housing, an oxygen sensor, OBS, Transmissometer, PAR-sensor, Fluorimeter, and 22 NOEX 10 liter water samplers with teflon taps and titanium valves and the NIOZ designed multi-valve closing system) identical to the system that was lost and recovered last year has been constructed.
A 3 million Euro grant has been obtained for a Long term Ocean Climate Observation (LOCO) project within the CLIVAR program for mooring deployment in the North Atlantic (Irminger Sea and Canary Basin), the Indian Ocean (Mozambique Strait) and Indonesia (ARLINDO co-operation).

Mr. Fred Smits (New Zealand) reported that NIWA's vessels R/V TANGAROA and KAHAROA had a very busy schedule during the 2001-2002 fiscal year. TANGAROA (70 m) completed a total of 347 sea days, including 151 for fisheries research (mainly acoustics and trawling) and 104 days for marine sciences, comprising oceanography, marine geology and geophysics, and marine biology. A 44 day Antarctic charter to study primary production for the Japanese Polar Institute in February and March 2002 was followed by a 14 day charter for the New Zealand Crown Research Institute of Geological Sciences. During May and June 2002 TANGAROA carried out the last survey for the delimitation of the New Zealand's Legal Continental Shelf, a claim which we aim to submit tot the UN by 2006.
TANGAROA expects to complete some 330 sea-days during the coming year, with the vast majority of work again for New Zealand Government funded fisheries and marine sciences research. A second Antarctic voyage for the Japanese National Institute of Polar Research during February and March 2003 is planned together with a joint Australian-New Zealand biodiversity study in the Lord Howe Rise Region. NIWA also expects to carry out some 10-20 days survey work for the oil and gas industry.
Recent improvements of TANGAROA have included a further 4 berths – increasing the total ships complement to 44, a hospital, a new constant temperature laboratory, a new 24-bottle CTD system, and new ultra-freezing and cold

storage facilities. A 15 tons new Effer crane has been fitted on starboard together with improved lower deck access.
Programmed improvements during the upcoming docking in November include the installation of facilities for a high frequency multi-beam echosounder, such as the SIMRAD EM3000D, the ATLAS Fansweep or the SeaBat sounders. Further more a new winch has been ordered for 10.000m, 10.5 mm CTD cable to be installed during December-January. NIWA is currently studying the option of fitting a deep-coring system for geological sampling, and NIWA is also working on a feasibility study for the operation of a helicopter from the vessel.
RV KAHAROA (28m) completed a total of 304 sea days, comprising 82 days for fisheries stock assessment and 222 for the hydrographic survey of the Foveaus Strait, under contract to Land Information New Zealand, the government department responsible for the production and maintenance of the countries' hydrographic charts. For this survey NIWA had fitted RV KAHAROA with a, Reson SeaBat 8101 multi-beam echosounder in 2000.
Unfortunate technical and systematic heave errors of the TSS POS MV compensation system caused by the extreme long ocean swells (>25 seconds) around New Zealand's coast have turned this scheduled 105 days contract into a survey of at least 360 days, possibly more. This contract has thus become very costly for NIWA and for NIWA's subcontractor Thales (Geosolutions) Australia Pty (formerly Racal Australia).

Mr. Nieuwejaar (Norway) reported on the fleet of the Institute of Marine Research (IMR) in Bergen, Norway. IMR owns four vessels and operates another two for other owners. They are:
- R/V G.O. SARS – LOA 70 m built 1970, to be replaced (see below)
- R/V JOHAN HJORT - LOA 64.4 m built 1990
- R/V MICHAEL SARS – LOA 47.5 m, built 1978/79 for coastal surveys
- R/V G M DANNEVIG – LOA 28 m, shallow draft, built 1979 and stationed in Arendal,.
- R/V DR.FRIDJOF NANSEN – LOA 57 m, built 1993, owned by NORAD (Norwegian Agency for Foreign Aid) which so far year has been working off the West Coast of Africa between Morocco and South Africa, having Walvis Bay, Namibia as her 'home base'.
- R/V HåKON MOSBY – LOA 47 m, built 1980, owned by the University of Bergen and mainly used for geological and seismic surveys

In addition we rent the small R/V FANGST - LOA 15 m, built 2000, for approx. 200 days a year and the R/V JAN MAYEN, LOA 63,8 m, built 1988 for 75 days a year. For more information about the vessels, please visit our renewed website www.imr.no

Mr. Nieuwejaar reported on the Project "New G. O. Sars"
IMR is building a new RV together with the University of Bergen. The vessel will be delivered in the spring of 2003 and the main characteristics are: LOA 77.5 m, 3800 GRT, max speed 17 knots, 50 tons pull, diesel-electric propulsion system, and very low radiated noise to water. Tasks to be performed are survey of marine resources, oceanographic survey (physical, chemical and biological), seismic surveys, bottom contour mapping, bottom coring etc. The steelwork has been done, the engines are installed, the vessel has been launched and the final fitting will take place in October. Details can be found on the IMR website.
Since our last meeting in Tasmania in September 2001, all our ships have operated in accordance with their cruise plans, which means approx. 300 – 320 days at sea, exempt "G.M.Dannevig" who has only one crew and approx. 190-200 days at sea.
The IMR and the University of Bergen (UiB) have signed a co-operation agreement for the common use of the new "G.O.Sars" and the existing "Håkon Mosby", which will be taken over by the IMR from 1 January 2003. IMR will from the same date take over the manning and operation of a small RV named "Hans Brattstrøm" which is owned by UiB. We will also take over the responsibility for an Remotely Operated Vehicle (ROV) owned by UiB. All in all this means that the IMR and UiB integrates their marine infrastructure and that the manning, maintenance, operation and management of the assets is concentrated in one place, which is the IMR RV department.
The IMR RV department is also in the process of establishing an agreement with the University of Tromsø in northern Norway for the common use of the long term rented vessel "Jan Mayen" and common management of the government owned scientific equipment used onboard that vessel.
The Norwegian Parliament have decided that the possible establishment of one common RV agency in Norway shall be explored and a proposal for this is expected to be ready sometimes next year.
The RV "Michael Sars" will be taken out of service on 1 January 2003 and the existing "G.O.Sars" will be taken out of service when the new "G.O.Sars" is ready for ordinary scientific cruises in the summer of 2003. The future use of these vessels are still not decided, but the Ministry of Fisheries is looking at different options. As mentioned before, the "Hans Brattstrøm" will be included in the fleet from 1 January 2003.

Mr. Eric Walker (South Africa) introduced Smit Marine South Africa. Their activities are salvage, marine emergency response, ocean towage, bunker delivery, offshore support and supply, offshore tanker terminals, underwater operation and specialist marine services. Smit Marine operates the three RV's owned by the Department of Environmental Affairs & Tourism (DEA&T), now all insured and ISM certified:
SA AGULHAS, ice strengthened ICE Class-I, LOA 112 m, built 1977
FRS AFRICANA, Fisheries research, Ice Class-II, LOA 78 m, built 1982
FRS ALGOA, Fisheries research, LOA 52.5 m, built 1975, converted 1993
The South African National Antarctic Programme, SANAP is managed under the auspices of the Directorate: Antarctic and Islands of the Department of Environmental Affairs and Tourism. SANAP encompasses three research stations, viz. a meteorological station at Gough Island, a meteorological and biological research station at Marion Island, and a physical sciences research program at the SANAE base in Queen Maud Land, Antarctica.
The mission of the South African National Antarctic Program (SANAP) is to increase understanding of the

natural environment and life in the Antarctic and Southern Ocean through appropriate science and technology. This is necessary in order to optimize present and preserve future options for South Africa in the region and to enhance predictive capability in areas of relevance nationally and internationally, and will also ensure that South Africa remains party to informed decision making on matters in the national interest. SA AGULHAS is the supply and research vessel. The crew aboard the ice-strengthened research vessel AGULHAS are experienced in working in the harsh Antarctic conditions, and completed their annual 2001-02 summer cruise to the SA National Antarctic Expedition base in February 2002. The vessel is equipped with high-tech communication equipment, including Sat-A and Sat-C systems, as well as two 1 500-watt radio systems. This austral winter the SA AGULHAS performed a successful evacuation mission of 89 Russian scientists and crew from Antarctica whose vessel, the Magdalena Oldendorff, was stranded by severe mid-winter conditions on the icy continent. The Magdalena was stranded in the Bay of Muskegbukta, approximately 510 nautical miles from the ice edge and 1 840 nautical miles from Cape Town. The Agulhas proceeded to within about 330km of the Magdalena, and from there its two Oryx helicopters proceeded to airlift over 2 000kg of supplies and evacuate 78 Russian expedition personnel and 11 crewmembers, finally completing their mission on Monday 1 July. Flying conditions in Antarctica this time of year are hazardous. The window for flying is restricted to 5-6 hours per day, due to the length of the polar night. This does not take into account the weather conditions - a relatively simple operation such as refueling can be extremely difficult in sub-zero temperatures. The crews are highly experienced, however, and all risks were assessed and minimised as far as possible. 22 Squadron has many years of experience in Antarctic support, and was an integral part of the summer change-over at the SA National Antarctic Expedition base until last year. President Thabo Mbeki congratulated the captain of the *Agulhas* and his team, saying: "This mission follows in the footsteps of many great South Africans who have placed the welfare of others above their own needs. Your selflessness serves as an inspiration to all South Africans - you did South Africa proud."

Also *Mr. Walker* reported on the Coelacanth project, a German – South African co-operation, for which research cruises to study this living fossil were held using the German submersible JAGO on FRS ALGOAS off Sodwana Bay.

Prof. Juanjo Dañobeitia (Spain) reported on the Spanish research fleet.

Research vessel (R/V) Hespérides, (LOA 82.5 m) (http://www.utm.csic.es/Hesperides/) is a vessel belonging to the Spanish Navy was built and launched in 1990. It is based upon the Port of Cartagena. The research that is carried out on this vessel is directed and funded mainly by the National R+D+I Plan. Since it is a Great Facility, the Ministry of Science and Technology, through the Committee for the Coordination and Follow-up of Oceanographic Vessels' Activities, undertake the responsibility for the scientific management of the vessel. Over its existence (over ten years now), R/V Hespérides has carried out many research expeditions, traveled over 300,000 nautical miles and welcome over a thousand researchers and Spanish and foreign technicians. She's work area is worldwide, mostly in the Atlantic & Antarctic oceans, but also in the Mediterranean and Pacific oceans. The R/V Hespérides is a multipurpose vessel well equipped for geophysical, physical and chemical oceanographic, marine biology & geology studies.

Oceanographic vessel (O/V) García del Cid (http://www.utm.csic.es/Gdc/garcia.htm) belongs to Consejo Superior de Investigaciones Científicas (CSIC) (LOA 37.2 m) and was launched in 1979. Its maintenance is carried out in Vigo (Spain) with the support of CSIC's Marine Research Institute. This vessel is specifically used for marine scientific research and by national or international scientific teams carrying out oceanographic research. It aims at developing scientific research in different fields (biology, geology, oceanography, and physics) and in the Western Mediterranean, in the Iberian area of the Atlantic Ocean and the Canary Islands. Occasionally, if the scientific project so requires, it travels to other areas. It is based upon the Port of Barcelona. The B/O Mytilus (LOA 24 m) (http://www.iim.csic.es/Mytilus.html) also belongs to the CSIC, is based upon the Port of Vigo, and is dedicated to physical and chemical oceanography and marine geology, operates frequently in the Iberian Atlantic coast and the Canaries and eventually in the Mediterranean.

The UTM (http://www.utm.csic.es/) is an Institute belonging to the CSIC which is in charge of the maintenance of the scientific equipment of the R/V Hespérides & García del Cid. The UTM is based mostly in Barcelona, with a branch in the IIM-CSIC in Vigo, and provides the necessary supporting technical staff for oceanographic expeditions, offering R+D in the marine technology field. A significant reorganization is taking place in Spain at national level, and concerns the management, logistics and technical support of the complete oceanographic fleet, involving the UTM-CSIC and the IEO as the main partners to achieve it.

The B/O Cornide de Saavedra (LOA 66.7 m) belongs to the Instituto Español de Oceanografia (IEO). This vessel is used for marine scientific research and by national or international scientific teams. It aims at developing scientific research in different fields (biology, geology, oceanography, and physics) in the Western Mediterranean, in the Iberian areas of the Atlantic Ocean and the Canary Islands. It is based upon the Port of Vigo. B/O Francisco de Paula Navarro (LOA 30.46 m) is another ship from the IEO, and is devoted to fisheries activities and physical oceanography around the Spanish Atlantic and Mediterranean coasts. It is based upon the Port of La Coruña.

Moreover, the IEO has a group of 15-20 m long ships (http://www.ieo.es/buques.html) dedicated to coastal areas research.

IEO is an autonomous research organization of the Spanish Government attached to the Ministry of Science and Technology. Founded in 1914, the IEO is devoted to the study of the sea and its resources, for which it acts as an adviser to the Administration. Besides the direct research activities, the IEO is the Government consulting body mainly in the field of marine fisheries, aqua-culture and marine pollution, representing the Department in international organizations and coordinating the

participation in international programs dealing with oceanography and fisheries in coordination with the State Secretariat for Scientific and Technological Policy, the Ministry of Foreign Affairs and the national Science and Technology Commission
Recently two 'new' research vessels have been added to the fleet. The RV Thalassa (LOA 75 m) of IFREMER, for which the Spanish Institute of Oceanography (IEO) has a special agreement with IFREMER through co-financing the building of the ship. It is used two months per year for fish stock assessment in the North Atlantic. Also the R/V Vizconde de Eza of the Ministry of Agriculture, Fisheries and Food. The Vizconde de Eza (LOA 54 m) built 2001 has dynamic positioning, automated fisheries operations and a retractable keel to reduce any noise or disturbance.
The Ministry of Science and Technology has recently approved the construction of a new multipurpose oceanographic vessel (LOA: 60-70 m) for oceanic research that will be run by the CSIC.

Mr. Mikhail J.Romanov and Mr. Alexey V.Turchin (Russia – INTAARI) were attending ISOM for the first time. INTAARI, St. Petersburg, founded in 1989, is a well established Arctic and Antarctic Logistics Operator in Russia and Europe. INTAARI S.A. has access to specialised vessels and aircraft required in the Arctic and Antarctic and with 12 years of valuable experience of working in these regions has developed excellent contacts, and a comprehensive understanding of the research, in marine and aviation industries. INTAARI is currently the operator for the AARI fleet of vessels. Within the past years INTAARI has established close partnership with the companies in the USA, Canada, England, Germany, Finland, Sweden, Norway, South Africa and other countries. The main spheres of activities are: Organization and logistic support of marine and polar expeditions, according to the international and Russian research programs. On-line (real- time) support of safety during navigation along the Northern Sea Route and engineering/prospecting operations in the Arctic shelf area. Sonar survey and seismic/acoustic profiling of sea bed relief. Sub sea engineering operations and production of underwater remotely operated vehicles, robots (this type of works is temporarily suspended). Introduction of automated stations and systems for hydro-meteorological observations in the remote Arctic and Antarctic areas; Cargo shipping services; Marine passenger transportation; Consulting services for organization and support of the vessels' repair, marketing and supply of spare parts for ship mechanisms and equipment-arranged in close contact with the affiliate of the German company Flying Shipping Repair Germany in St. Petersburg. Services in organization of rest and sport events, including marine and scientific tourism.
Considering the growing interest for the Antarctic continent and the Arctic area INTAARI fulfilled the refurbishment of the research vessel "PROFESSOR MULTANOVSKY" into a vessel of the passenger class and after that, beginning with 1995, jointly with the companies "Marine Expeditions" and "Quark Expeditions" has been organizing international tourist marine cruises to the Antarctic and Arctic areas. Projects of the last few years comprise Logistic support of the "TAIMYR-99" and "Jugorsky-99" expeditions for the Swedish Polar Research Secretariat, and the logistic support and hydro-meteorological support of Finnish-Norwegian-Swedish (Nordic) Antarctic expedition on board R/V "AKADEMIK FEDOROV" in Antarctica for the Norwegian Polar Institute, the
Swedish Polar Research Secretariat, and the Finnish Institute of Marine Research. 'AKADEMIK FEDOROV' was built in 1987 in Finland to support polar operations and can carry up to 160 passengers, while crew numbers are close to 70. She is one of the best ice class vessels in the world. As an associate of INTAARI, the Antarctic Logistics Centre International (ALCI) instituted in September 2001 a fully operational shipping link between Cape Town and Antarctica. ALCI accesses a broad base of experience and expertise in servicing Antarctic research stations.

Dr. Mike Webb (NERC, UK) reported on the Natural Environment Research Council (NERC) marine facilities.
marine facilities. At the start of the 2001, NERC changed the way that it funded its marine facilities in response to falling demand for ship-time. A new funding model was designed to reduce the overall cost to scientists for days at sea in order that NERC could test the 'actual' science demand for ship-time.
Under the new funding arrangements, scientists who have secured science funding from NERC, non-NERC peer-reviewed sources (e.g., the EU & USA) and commissioned research sources can bid to NERC for 'free at the point of use' access to its marine facilities. For a bid to qualify for 'free at the point of use' access, the accompanying science case must have been graded as being of international quality (i.e. equivalent to a NERC alpha 3 science grade) by a suitable peer-review panel. The infrastructure & capital cost of supporting the ships and the equipment from NERC's National Marine Equipment Pool is paid from central NERC infrastructure & capital funds. And so, under the new arrangements scientists are only responsible for covering the technician and equipment support costs for cruises.
The new funding model provides NERC with access to between 450 and 500 operational sea days a year on the RRS Discovery and RRS Charles Darwin (operated by the Research Ship Unit (RSU)), and 60-days a year on the RRS James Clark Ross (operated by the British Antarctic Survey (BAS)). NERC has also provided infrastructure funding to the UK Ocean Research Services (UKORS) so that it can provide technician & equipment support to the NERC marine facilities programme, and to provide it with funding to manage NERC's National Marine Equipment Pool. In addition, ca.£500k per year has been allocated to UKORS to cover the capital costs associated with maintaining, and enhancing, NERC's marine equipment capabilities.
As a consequence all of the sea days that were available to NERC have been allocated in 2001, 2002, and 2003 (this represents an increase of between 50-60% compared with the number of NERC science days at sea that were programmed in 1998, 1999 & 2000). Also the demand for NERC science days has increased by around 100% (compared with that in the period 1998-2000). For example, the demand for sea days in the 2003 marine facilities programme exceeded the available number of NERC science days by approximately 170-days.
NERC's average annual capital investment in marine equipment has been ca.£600k (NB. this includes equipment

hire income), which is approximately 100% higher than in the years prior to the start of the funding model. In addition, a 'one-off' investment of ca.£2.5M from the UK Government's Joint Infrastructure Fund has been made in new marine physics & chemistry sampling equipment for the National Marine Equipment Pool.
Regarding the 2001 marine facilities programme: Following the September 11th attack on the United States, NERC postponed a 30-day cruise on the RRS Charles Darwin that was scheduled to work to/from Muscat, Oman in October/November 2001. Following a risk assessment, NERC decided not to withdraw the Darwin from the Indian Ocean and so the ship was moved into the Southern Indian Ocean to pick-up the remaining part of its 2001 cruise programme
In 2002, NERC has continued to fully utilize all of the available sea days on the RRS Discovery, which operated in the North Atlantic, and the RRS Charles Darwin, which operated in the Indian Ocean. In addition, NERC has programmed all of the available NERC science days (ca. 60 days) on the RRS James Clark Ross – primarily for two summer cruises in the North Atlantic.
In addition during 2002 NERC arranged an opportunistic barter cruise to recover & re-deploy moorings on the Porcupine Abyssal Plain using the R/V Poseidon as it was transiting from the North Sea to the Azores in early 2002. Unfortunately poor weather meant that the cruise had to be cancelled.
NERC set-up a Project Management Board to oversee provision of a replacement ship for the RRS Charles Darwin, which will reach the end of its scientifically useful life in early-2006. This followed the approval by NERC Council of a science case for a replacement ship in late-2001, which has since been submitted to the UK Government as part of a NERC bid to the 2002 Spending Review. The total cost of the replacement ship is projected to be £35M, of which NERC will contribute ca.£10M from its own baseline. A final decision on the funding will be announced in November 2002.
NERC allocated ca.£3M to RSU for the design, manufacture and installation of a new scientific winch system for the RRS Discovery. It is anticipated that the winch will be fitted in the period February-April 2003.
NERC procured a set of Bolt Airguns (costing ca.£300k). The airguns were successfully trailed in early 2002, before being used in June-July for a 45-day geophysics cruise in the North Atlantic

For 2003 the marine facilities programme was published on the 1st August 2002 and, once again, all of the available NERC science days were allocated on the RRS Charles Darwin, RRS Discovery and the RRS James Clark Ross. At the present time NERC is planning for the Darwin to operate in the Arabian Sea for a significant part of the year – although this will clearly be subject to review following events in the Middle East. In the event that the decision is made to re-deploy the ship it is likely that a new programme of work will be conducted in the Southern Indian Ocean, working from Durban, South Africa.
It is anticipated that the Jason II derivative ROV (that will be based at the Southampton Oceanography Centre) will become operation towards the end of the year following its engineering trials in the first half of the year

Based on confirmed and provisional bids for ship-time in 2004 it is currently anticipated that in 2004:
The Research Ship Unit (RSU) ships, RRS Discovery and RRS Charles Darwin, will primarily operate in the North Atlantic and adjacent seas, although depending on the science demand one of the ships may return to the South Atlantic &/or Southern Indian Ocean at some point in the second half of 2004.
The BAS ships, RRS James Clark Ross and RRS Ernest Shackleton, will operate in the Antarctic/Southern Ocean, Arctic Ocean and the Atlantic. Up to two months a year are normally available for NERC-funded research cruises, although the majority of the available NERC-funded time in 2004 will be allocated to two cruises (one in the Antarctic & one in the Arctic) for the 'Autosub-Under-Ice' thematic programme.

Mr. John Morrison (SEERAD – Scotland, UK) reported on the fleet activities of FRS Marine Laboratory Aberdeen R/V SCOTIA (LOA 68 m, built 1997) has continued to give excellent service with virtually every cruise achieving or exceeding its objectives. Fishing cruises mainly in the ICES framework, took up about 70% of SCOTIA's time with the majority of effort being targeted at demersal species, but with cruises also targeting Nephrops, mackerel and herring. Every three years Scotia is programmed to take part in the International Mackerel Egg Survey- which provides an index of the spawning biomass of the mackerel stock spawning on the edge of the shelf from west of Shetland to the Bay of Biscay. Two cruises, comprising a total of 45 days, were devoted to this aspect in the period April to June. In addition, a herring acoustic survey and a first cruise aimed at investigating the efficiency of currently used sampling trawls (using sonar and ROV technology) were also carried out. The latter type of cruise is of particular importance - as it aims to give an insight into factors that might introduce variability in the catches taken during the ground fish surveys. A better understanding of these factors could have important implications on improving the precision of stock estimates. R/V SCOTIA also carried out important environmental surveys, both in the Faeroe –Shetland channel where she provided more valuable data for examination of "global warming" questions and in the North Atlantic where she carried out plankton surveys in relation to fish survival and recruitment. R/V SCOTIA spent 285 days at sea in 2001-2002 (target 290 days) - despite a major engine failure in February 2002 which incurred an intangible insurance knot, and had further impacts on the programme in 2002/2003. .
The smaller R/V CLUPEA was built in 1969 - and clearly cannot continue to operate indefinitely - as there is now considerable wear and tear in the fabric of the vessel. Despite her age however, Clupea has operated very effectively though the year and achieved 241 days at sea (against a target of 250).R/V CLUPEA's time in the past year has been spread over a wide variety of projects. About 25% of the time has been spent on investigating the fish and shellfish populations in the lochs and other inshore areas of the west coast. Approximately another 20 % of the time has been spent in support of studies on interactions between the different species of fish and the various sea birds and sea

mammals that prey on them and a further 10 % of time has been spent in attempts to investigate cod spawning areas. Other investigations have included: mesh selection; hydrography and sediment chemistry of sea lochs on the west coast in relation to fish farming; scallop, Nephrop and sand-eel surveys and pollutant trend monitoring surveys.

A business case for the replacement of R/V CLUPEA (at an estimated cost of £7.2 million) was recently carried forward to the 2003 spending revue. It appears however that money for a replacement vessel is unlikely to be available within the next three years. Accordingly, in view of the need to keep the vessel fully operational, an extended refit was carried out in April 2003 during which the electrical generation system was replaced and the accommodation refurbished.

Mr. John Freitag (USA – ONR) reported on internal changes at ONR. Ms. Sujata Millick left ONR last December to take a position at Department of Commerce and he has taken over the position at Research Facilities
Mr. Freitag reported on the six R/V's owned by ONR.
R/V's MELVILLE (LOA 279 ft), THOMAS THOMPSON (LOA 274 ft) , KNORR (LOA 279 ft), ROGER REVELLE (274 ft) , ATLANTIS (LOA 274 ft), KILO MOANA (LOA 185 ft). All vessels are now ISM certified.
This year the ship time of the six ONR owned ships in the UNOLS fleet was 950 days, of which 750 days were funded by ONR projects(an increase of approximately 60%)
The new R/V KILO MOANA was delivered to the University of Hawaii as operator in September 2002. KILO MOANA is the first member of the Ocean vessels which will replace the present intermediate class.
As the first SWATH (Small Waterplane Area Twin Hull) design in the UNOLS fleet, the KILO MOANA's performance will be of great interest to the community. Some characteristics are: LOA: 185 ft, beam 88 ft, speed: 15 knots, operational in Sea State: 6 at 12 knots, Range: 10.000 nautical miles at 11 knots, Endurance 50 days, science berths 31. The unique characteristics of the vessel make at-sea science operations different from conventional hull ships. The ship's propulsion arrangement provides for work in an undisturbed wake.
Handling gear: DYNACON winches and stern U-frame.
Oceanographic equipment: Deep Water Multibeam Echo Sounder (Simrad EM120)
Shallow Water Multibeam Echo Sounder (Simrad EM1002)
Hydrographic Echo Sounder (Simrad EA 500)
Acoustic Positioning System (Simrad HPR 418)
Acoustic Doppler Current Profiler (Sontek 125)
Depth Finding System (Raytheon Model 795)
Mr. Freitag showed a video of the launch.
For the renewal plan of the fleet a study was commissioned to consider 4 classes of oceanographic ships:
The study should comprise: the compilation of science requirements for each class, and the investigation of areas of commonality. Also to develop construction and operating cost estimates, and consideration of various hull forms.
Regarding the renewal costs the estimation is that the Regional Class is to be kept under USD 25 Million. NSF is considering funding this class. For the Ocean Class cost estimates are USD 50 Million and for the Global Class 65 to 70 Million. The US Navy will probably fund these classes.

Ms. Dolly Dieter (USA – NSF) reported on the University National Oceanographic Laboratory System (UNOLS) fleet funded by NSF. Though the operations are funded by NSF, NSF owns only 8 ships. The 29 ships operated by 21 institutions had an average year with a total of nearly 4900 ship days. This was less than the projected 5200 and considerably less than the very busy year 2001 with nearly 5700. It was not the Global but the intermediate ships where there were some problems. For next year it looks like the projected number will be back to normal with 5300.
There were some changes in the fleet. The new vessel KILO MOANA (185 ft) has been taken into service and other renewals are completed such as the R/V's SAVANNAH (90 ft), of Georgia, or underway like the ALPHA HELIX replacement (225 ft) of Alaska and the CAPE HENLOPEN replacement of Delaware.
Mid-life overhaul is planned for R/V MAURICE EWING (New York) for scientific equipment and machinery, Cape Hatteras (North Carolina) for labs and machinery, PELICAN (Louisiana) for a stretching operation, BLUE HERON (Minnesota) for lab space.
The Arctic icebreaker science systems' testing on R/V HEALY of the USCG was conducted and the ship is now operating in the Arctic.
NSF is attempting to upgrade equipment on the UNOLS vessels through the Shipboard Scientific Support Equipment Program. The program aims at group purchases, and did so successfully for Defibrillators, Lab Vans, Work Boats, Immersion Suits and GMDSS Radio Equipment.
A pilot study has been conducted to generate a computerised maintenance program.
UNOLS is putting effort in upgrading safety and security and level of quality. For better quality and standardization of winch and wire UNOLS is awaiting new developments as they come from the UK.
The UNOLS ships have turned to Iridium instead of Sat-Com for communications. The ship inspection program that run from 1998 – 2002 is almost completed. 22 ships were inspected. Purpose of this activity is to update the science capability, comply with current safety standards, and quality maintenance.

Cdr. Elizabeth White (USA–NOAA) reported on the National Oceanic & Atmospheric Administration (NOAA) and especially the Office of Marine & Aviation Operations (OMAO). OMAO is the centralized management and operation centre of modern data collection platforms: OMAO runs 15 vessels and 13 aircraft. In 2004 it is planned that the number of ships will have increased to 18. The biggest ship is the R/V RONALD H. BROWN (LOA274 ft = 83.5 m). The ship's section of OMAO has a Marine Operations Centre with an Operations division, a Marine Engineering division, a Marine Support division and a Resource Management division. Under the Ships division also belongs the NOAA Diving Program. OMAO has 240 commissioned officer with operational expertise as well as engineering and scientific training. OMAO has a highly mobile and flexible personnel system. Assignments are throughout NOAA. NOAA has centres all along the

American coasts: in Seattle (4 ships) San Diego (1 ship) Hawaii (2 ships) Pascagoula (2 ships) Charleston (2 ships), Norfolk (2 ships) and Woods Hole (2 ships). The West Coast Marine Operational Centre is in Seattle and the East Coast centre in Norfolk. The mission of the ships are charting and mapping, fisheries research, oceanographic research and environmental assessment.
The new fisheries science vessel that is commissioned for 2004 will be stationed in Alaska.
The requirements are: Multi-Mission Capable, Fish Stock Assessments, Fisheries Oceanography, Fisheries Hydrography, Habitat Studies and Characterization, Marine Mammal Assessment and Research, Acoustically Quiet, Prevention of Fish Avoidance Behavior, Standardization with Rest-of-World FRVs, Near-military Radiated Noise Signature Requirement, Large, Slow-turning, Low Pitched Propeller , Sonar Self Noise Requirement, IMO/USCG Airborne Noise Standard, Extensive Hull and Machinery Noise Treatments, Common Platform for Many Regions, Deep Water Operational Capability, 40 Day Endurance, Compliance with International Safety, Pollution, Design and Operations Standards. The NOAA fleet staffing consists of a mix of Commissioned Officers and Civilian Wage Marine (WM). The WMs include Licensed Engineers, Unlicensed Personnel and Masters and Mates. The WMs and Electronic Techs (ET) are Members of Maritime Unions SIU/NMU, MEBA, IBEW, and MM&P. Two of the 15 Vessels have Civilian Masters.

3.2. Ship Time Barter/Exchange

Mr. Jon Reeve (Australia – AAD) mentioned that AAD does not own its ships, but charter them instead. So there are no barter opportunities. Also the eccentric location in Southern Tasmania limits such opportunities. However, AAD is keen to consider such proposals.

Mr. Jean-Xavier Castrec (Ifremer France) reported that in 2002 two cruises were planned with their partner of IFM Kiel (Institute Fur Meereskunde an der Universität Kiel) according to the tripartite agreement, the first in January 2002, cruise MOVE (20 days) on R/V L'Atalante near The French Indies and the second in mid-September (4 days) on R/V Le Suroit in the Adriatic sea to drop a mooring.
Ifremer also performed in August 2002 cruise SEAHMA/1 (17 days) on R/V L'Atalante and Victor 6000 for their Portuguese partner FCUL (Fac. Ciencas Univ. Lisboa).
For 2003 we have 2 projects :- one with NERC : for NERC one cruise on R/V Thalassa with NERC ROV for Ifremer- one cruise on R/V Discovery; and - one with Germany :for Germany- one cruise on R/V L'Atalante - one cruise on R/V Polarstern with ROV/Victor for Ifremer - two cruises on R/V Poseidon- one cruise on R/V Sonne.

Ms. Marieke Rietveld (Netherlands) mentioned that in the framework of co-operation with Italy a PASS-cruise (Palaeoceanography: Sapropels, gashydrates and mudvolcanoes in the Mediterranean) (BIODEEP) has been performed on the Italian R/V URANIA in the Central Mediterranean. The New Zealand R/V TANGAROA performed lander deployment and recovery with the NIOZ recruitment lander system on the New Zealand continental shelf in a co-operative programme.

Dr. Mike Webb (NERC – UK) reported that, NERC has provisionally programmed six barter cruises – although a number of these have still to be confirmed. NERC is hoping to programme it's first barter cruise with NIOZ, however this is contingent on NIOZ joining the Marine Facilities Tripartite Group (MFTG). NERC (& its MFTG partners) will start to examine opportunities to share a greater variety of its marine equipment (incl. smaller equipment & equipment spares) and to share marine equipment calibration facilities.

Ms. Dolly Dieter (NSF – USA) mentioned that there were no barters in 2002, but that in 2003 the MAURICE EWING probably will be used by the UK for seismics and ROV testing.

3.3. Staff Exchanges

There were no reports on staff exchanges.

3.4. Equipment lost

Mr. Jon Reeve (Australia – AAD) reported the major recent loss of a CTD system from the AURORA AUSTRALIS. The loss was the result of problems in the CTD winch control system. Other items including nets were lost during transit from the deck of the AURORA AUSTRALIS in heavy sea conditions.

Mr. André Pollentier (Belgium) reported the loss of a box corer.

Prof. Gerhard Kortum (Germany) reported that R/V POSEIDON was almost lost due to fire in the engine room 300 nm West of Cape Cod. The fire could be extinguished and POSEIDON is back in Germany.

Cpt. Masatake Zaitsu (JAMSTEC - Japan) reported that no equipment losses had occurred. There will be a special report later during the meeting on the recovery of sunken moorings by an entangling device.

Ms. Marieke Rietveld (Netherlands) reported on equipment lost and recovered:
A dredging effort in the Mediterranean for a lost sediment trap by RV URANIA (Italy) was unsuccessful.
Of the two moorings deployed in the Gulf of Aden in Spring 2001, that could not be recovered as planned in Autumn 2001 with the French R/V MARION DUFRESNE, because all cruises in the area had to be cancelled because of the war in Afghanistan, one Argos beacon signaled that the mooring was drifting and/or that only the beacon had been recovered by a local fisherman. He could be followed crossing the Gulf and was apparently based on the island of Abd-al-Kuri, West of Socotra. NIOZ decided to ask for help from the Dutch Navy that was operational in the Arabian Sea in the framework of the anti-terrorist war, for recovery of the moorings on the way back home. One mooring with sediment traps could be successfully recovered by HMs VAN AMSTEL early June. The other did not respond any more to the release signal, and is considered lost. A small NIOZ team embarked in Dubai and disembarked at the end of the operation in Suez.

Mr. Fred Smits (New Zealand) reported the loss of the HPR tracker, several nets, and a 120 kHz Acoustic Fisheries Probe due to cable break.

4. European RV Operators Workshop – Bergen, Norway, April 2002

Mr. Per Nieuwejaar (Norway) reported on the 4th ERVO meeting held in Norway 24 - 26 April 2002, which was hosted by the IMR in Bergen. The meeting was chaired by Geoffrey O'Sullivan (Ireland) of the European Science Foundation (ESF) Marine Board. There were 18 participants of 12 European countries, of which 3 from outside the European Union (Belgium, France, Germany, Greece, Iceland, Ireland, Italy, the Netherlands, Norway, Portugal, Romania and United Kingdom). The topics discussed were Crew exchange, Under water acoustics, ISM implementation, STCW 95 – training and health requirements, ICES Centenary, Copenhagen, New ships, Classification issues, Working hours for scientists, EurOcean, EU 6 Framework Programme, and AOB.
Regarding the Training and Health requirement issue the Norwegian Maritime Directorate (NMD) was invited to the meeting. The NMD stated that all personnel must sign on to the ship and have health certificate for sailors. The level of training is defined by the ship operator according to the ISM code.
On the Classification issue Det Norske Veritas (DNV) was invited to the meeting and recommended the use of cargo ship class with necessary amendments, and not to develop a specific "RV-class" due to wide variety of vessels defined as RVs. ERVO decided to leave the issue of developing an RV class based on the DNV recommendations. When discussing the working hours for scientists on board, it was stressed that scientists do not need to comply with ILO working hours regulations (C 180 Seafarers hours of work and the manning of ships convention, 1996), but if not they must comply with the EU Working Hours Directive which is more restrictive for shipboard operations. Work and Rest according to ILO 180 can be implemented as maximum hours of work that shall not exceed: - 14 hours in any 24 hours period and - 72 hours in any seven-day period
Minimum hours of rest shall not be less than: - Ten hours in any 24-hour period and - 77 hours in any seven-day period. Hours of rest may be divided into no more than two period, one of which shall be at least six hours in length and the interval between consecutive periods of rest shall not exceed 14 hours.
The minutes of ERVO are available on the ESF Marine Board website: http://www.esf.org

5. Future plans on research fleets

5.1. US –Charting the Future for the National Academic Research Fleet

Ms. Dolly Dieter (NSF – USA) recalled that it took 1.5 years to put together the end version of the FOFC "Charting the Future for the National Academic Research Fleet" ship renewal Plan. "The Plan" defines the strategy for renewals, retirements and technology upgrades for research vessels over 40 m. The assumption is that RV's have a nominal life span of 30 years. One of the questions was to have the distribution geographically and scientifically well balanced according to mission requirements and science capabilities. The Plan spans a 20 year period (2000 – 2020) and will be updated every 5 years. In this period at least 10 new ships are required. This number includes 1 Global class, 6 Ocean class and 3 Regional class ships. The general characteristics of this 3 classes are: endurance: 50, 40 and 30 days respectively; range: 25, 20 and 15 thousand km, length 70 – 90, 55 – 70, 40 – 55 m, and science berths: 30 – 35, 20 – 25 and 15 – 20. Running costs: 8 – 6 million, 4 – 5 million, 1.5 – 2 million USD.
The real issue now is the acquisition. First of all political support is needed for the necessary fund allocation. NSF considers funding the Regional class and specialised vehicles like submersibles, ROV's and AUV's. The Navy probably will fund the larger classes. For practical reasons ONR and NSF are proceeding jointly. First the SMR's (Science Mission Requirements) have to be defined. For the Ocean and Regional class this process has started this summer with the organisation of two workshops attended by scientists, operators, ship design experts and agency representatives.
Ms. Dieter reported on the preliminary design development for the replacement of the ALPHA HELIX. The design for the ARRV (Alaska Region Research Vessel) should meet the requirements for fisheries and general oceanographic research in remote and ice-covered areas. The design opts for a LOA of 226 ft (69 m). Because of budget restraints this tends to get smaller. Fuel capacity is the restricting factor (148.000 gallons = 560.000 l), endurance 45 days, range 18.000 nm at cruising speed. 24 science berths (although one would like more). No lab vans, because the deck will be heated to keep the ice off. Speed max 14 – 12 knots cruising, and performance in level ice conditions of 0.75 m at 2 knots. Design challenges are: radiated noise reduction to meet ICES standards and anti-roll installation yes or no, in relation to the COSPAR regulations (double hull). PC-5 Ice Class: year round capacity for first-year and older ice. The ship is planned to be delivered in 2005.
Ms. Dieter also gave an overview of the upgrading process of the deep submergence facilities at Woods Hole: JASON and ALVIN. The new JASON has just been completed and is on its maiden voyage. It is heavier and has more power than its predecessor. Regarding the ALVIN it came out that the science community do not want to get rid of the existing ALVIN, but would like to have another one with improved science capabilities and a more ergonomic design, which means a less crammed space for pilot and passengers.

5.2. EU – 6th Framework and European Research Area – Marine Infrastructure

Mr.Gilles Ollier (EU) stated that within the European Union there is not (yet) a plan for fleet renewal on a European scale. There has been made an inventory of the European fleet, and the ESF Marine Board has produced a working document for an Integrated Science Plan for Marine Science in Europe (September 2002).
In the 5th Framework Programme the Marine Ecosystems programme focussed on 5 programmes: Coastal marine research, Ocean Margin research (OMARC), Operational forecasting on Marine Pollution and Marine Biodiversity. The driver of the use of research ships mostly were the Ocean Margin and the Operational Forecasting programmes. The EU costs for cruises are limited to a part of the total costs (10 – 15%) with a total of 5 Million Euro

for 50 cruises. The main funding for the cruises comes from the individual countries as matching. This means that EU funding is a good tool for sharing marine facilities. EU research cruises are mainly located in the North Atlantic (European waters), the Mediterranean and to a lesser extend in the Baltic and Black Sea.
For the 6th Framework Programme (2003 – 2006) the first Call for Proposals will be sent out in November 2002.
There is no individual programme for marine research, but the Global Change and Ecosystems Programme could harbour marine science, with added possibilities in the Infrastructure Support Programme. Of the total of 13,285 Million Euro of the 6FP, 700 Million Euro is dedicated for Global Change and Ecosystems.
From the Inventory report (Report on the National Fleets of Research Vessels in Europe that was drafted by RF (Germany), IFREMER (France) and NERC (UK) in a co-operative project funded by the EU and issued in December 2000) is known that in Europe there are about 25 RV's over 50 m. The fleet is not evenly distributed over the different countries, and most ships are 15 years old or older. Maintenance of the fleet is dependent of the different science budgets. The EU used to be a main funding source. Now, under the 6FP, no longer and better use and sharing of existing facilities should be stimulated. An ad-hoc group on Marine Research Infrastructure has been formed, shared by Finland, to discuss this issue and report to the European Committee. A first meeting has been planned on 19 September in Helsinki on board R/V ARANDA.
An EU press event on Arctic drilling has been organised on board R/V POLARSTERN on 25 October, to promote the IODP partnership. Speakers will be Jörn Thiede (director of AWI), John Ludden (INSU-CNRS) and Mikko Niini Kvaener of Masa-Yards Inc. (Finland), who will present the plans for building the AURORA BOREALIS.
In 2004 the EurOcean conference will be organised in Galway (Ireland). It will take place in May-June when Ireland has the EU presidency.
Regarding the research fleet inventory *Mr. Morrison (UK-Scotland)* stated that Fisheries R/V's should not be included with the multipurpose ships. *Mr. Danobeitia (Spain)* remarked that there are national plans to build new ships, and questioned the decrease within the EU budget for sea going marine research. *Ms. Rietveld (Netherlands)* mentioned that there was no commitment from the German Government nor from the EU for the plans to build an Arctic drilling vessel. *Prof. Kortum (Germany)* answered that there was a general fleet renewal plan, where the question was raised whether there was a scientific need for such a vessel. Further discussions will probably take place within the ad-hoc group meeting of 19 September.

6. RV Building and Ship Construction in ice conditions

Prof. Kaj Riska (Helsinki Technical University – HUT, Maritime Institute - Finland) was invited as a guest speaker to give a presentation on the design of research vessels for ice conditions. His expertise is in Arctic Marine Technology. Typical research questions addressed are:

- Safe design of structures to withstand the ice loading without any environmental risks
- The design of safe and efficient transport routes in the Arctic waters
- Formal Safety Analysis (FSA) related to operations in the ice covered waters

He recalled that the R/V HEALY is the heaviest ice-breaking RV in the world so far. When designing for ice conditions, the paramount consideration is the task of the vessel, and whether the ship should break ice or not. Then the operational area, and the required endurance.
The next question is, what kind of ice, and how does the ship encounter ice. The brittleness of the ice mat is a serious issue. There are different ice-hull interaction scenario's. Such as: level-ice, which means bow crushing; separate ice pieces (floats), which means heavy mass collisions; has the ship to sail in an old channel in the ice, which could mean collision on unconsolidated ridges and pieces. When encountering ridges and big pieces, young ridges are not the problem, but old are. Colliding with a massive ice floor of 5 – 7 m high brash ice could cause accidents. Accidents could also happen when in compressive ice the powers to the side of the ship become too strong.
The damage differs: "hammer-horsing" is the most common.
The performance in ice can be defined as the speed in level-ice thickness (say 1 m ice → 3 knots). In this formula level-ice is more or less theoretic. Most ice is dynamic, and multi-formed.
When coming to the design of the hull form, a small stem angle means better ice-breaking capacity, and a heavy hull with low gravity centre and rounded lines. Most add-ins are not very effective, like bow-washers, that only make sense with snow cover, but are not very cost-effective.
Then the selection of the machinery: Diesel-Electric propulsion guarantees the torque in heavy ice in all conditions. Even when backing the propeller should not stop. As a consequence the bow-stern movement vice versa makes it possible to make the stern act as bow when moving in ice from open water. This technology is used for so-called "double-acting" tankers. So far this is not used for smaller vessels.
More technical details on regulations for steel ice-strengthened ships can be found on
http://www.eagle.org/rules/corrigenda/02-SVR2003-Rcn1.pdf

7. RRS Charles Darwin Replacement – Update

Mr. Edward Cooper (NERC/SOC – UK) reported that funding for the replacement of RRS Charles Darwin is actively being sought and deliberated on with Research Councils UK (RCUK) following the Comprehensive Spending Review 2002 settlement that included additional funding for large facilities. The decision is expected in November. The current aim is the replacement of RRS CHARLES DARWIN with a multi-role oceanographic research vessel comprising, state of the art facilities and capable of operating world wide (tropics to ice edge) in support of leading edge multidisciplinary research. The vessel will operate on both the Continental Margin and Deep Ocean. Enhancements on the current capability of the NERC dedicated vessels available for ocean science will focus on the ability to sample in higher sea states, dynamic positioning, more scientific berths, improved handling systems and technical facilities including some integrated laboratories. In parallel with the funding request, a

consultation exercise amongst UK marine scientists and support services has been undertaken under the auspices of the NERC Research Vessel Advisory Panel (RVAP). This consultation exercises has been conducted to validate the detailed requirements of a "research platform" appropriate to be a leading facility for marine research into at least the first three decades of this century. The consultation has been undertaken under disciplines (scientific and technical) but with an eye to the multi-disciplinary nature of most research activities. Consideration has also been given to the modern implementation and forward look requirement of a number of vessels and programmes. An analysis of the consultation exercise is currently underway to determine the features desired (and justifiable) of a new vessel. This will result in a Statement of Requirement including some outline General Arrangement Drawings.
With an indication of successful funding, the project will move on with the current intent of a new vessel available in 2006. The total costs are estimated at 35 Million GBP.
Unconfirmed details assuming a new build are as follows: 82m vessel with DP, 32 Scientists / technicians, Drop Keels (no moon pool), Satellite Laboratory Containers (2?), other Containers (6?), Laboratory Suites mainly large and general but some dedicated, Multibeam(s), Sub Bottom Profiler, ADCP, Winches fitted and some re-positionable, ROV Capable, Self-serving with cranage.

8. Diplomatic Clearance

8.1. Update: US procedures/trends/trouble shooting

Ms. Liz Tirpak (Department of State - USA) introduced the diplomatic clearance issue, and gave a presentation on the procedures by the U.S. Government. The United Nations Convention on the Law of the Sea (UNCLOS) provides that States' have jurisdiction over marine scientific research (MSR) within the 200 nautical-mile area known as the Exclusive Economic Zone (EEZ) and the territorial sea. Although the U.S. does not exercise full jurisdiction over MSR within its EEZ, the U.S. recognizes all other nations' right to regulate such activities within their EEZs and territorial seas in a manner consistent with UNCLOS. The Department of State (DOS) facilitates the transmission of MSR applications to the appropriate authorities as required by UNCLOS articles 248 to 250. DOS assists both the U.S. research community seeking access to foreign territorial seas and EEZs and the foreign research community seeking access to U.S. waters. DOS also coordinates U.S. science policy development and delegations to international meetings such as IOC, ICES, PICES , SOPAC, regional fisheries management organizations, UNEP Regional Seas Programs, International Maritime Organization, and those regarding the application and interpretation of the Law of the Sea.
Ms. Tirpak presented clearance trends from the last five years, wherein the number of applications by the US to conduct MSR in foreign waters averaged approximately. 300 per year and the number of applications received from abroad are approximately 65 per year. The U.S. fleet has been denied 32 times over the last two years, primarily due to a lack of response from the coastal State. Explicit denials resulted from science plan conflicts with marine protected areas, and failure to meet lead times due to excessive application requirements. Repeated denials have been experienced with certain coastal States – DOS is engaging those States on this issue through bilateral meetings.
After the 9-11, applications have become more detailed, and meeting the lead time requirements of coastal States is paramount. It is also recommended that foreign collaboration be sought prior to submitting an application to DOS. DOS also requires that the ship Operator verify that there will not be an equipment scheduling conflict. Also, a threat assessment should be made considering the incidence of piracy and absence of diplomatic relations and/or governing authority in certain areas. DOS refers ship operators to NIMA Maritime Safety Reports (http://pollux.nss.nima.mil/index/index.html) and DOS travel warnings (http://travel.state.gov/warnings_list.html) for regularly updated information. For further information on U.S. diplomatic clearances, see the DOS website: http://www.state.gov/g/oes/ocns/rvc/.

8.2. The IOC ABE-LOS progress on art. 247 of UNCLOS

Prof. Alfred Soons (NILOS, Utrecht University – Netherlands) was invited as a guest speaker and discussed in brief the work carried out by the Advisory Body of Experts on the Law of the Sea (ABE-LOS) of IOC on the establishment of an internal IOC procedure for the use of Article 247 of the UN Convention on the Law of the Sea. That article provides for the possibility of adopting a simplified procedure for obtaining the consent of coastal states for the conduct of MSR in their EEZ's in case of MSR conducted by or under the auspices of international organisations.
Prof. Soons provided a progress report and asked for comments of ISOM members on the draft text that he prepared for discussion at the second meeting of ABE-LOS, held in May in Morocco. This paper and a previous document he prepared for the first meeting of IOC/ABE-LOS explaining Article 247 UNCLOS and the various aspects involved in its possible implementation by IOC were distributed as a hand-out. A third meeting of ABE-LOS will take place in the beginning of 2003.
The issues now on the agenda of ABE-LOS are transfer of marine science and technology, and the article 247 implementation.
The diplomatic clearance procedures are clear to all ISOM members. The question is how they can be improved. Here art. 247 might offer a possibility. The usual procedure is based on a bilateral consent relation. Art. 247 would mean a new consent regime, with a separate procedure, and can be useful where there are more ships involved and more research and coastal states for a particulate project. The question was whether such research projects could be undertaken under the auspices of an international organisation for this purpose, taking into account that any coastal state's interest should still be safeguarded. It is evident then that all coastal states involved should be involved in a project from an early stage of planning, under the presumption that all are interested.
Prof. Soons gave an annotation at his draft paper by paragraph.
Par. 1 – The proposed procedure implementing Art. 247 will only apply when the scientific project is covered by Part XIII of UNCLOS, and under the auspices of the Intergovernmental Oceanographic Commission (IOC). It cannot apply to work in the territorial sea or internal waters.

Par.2 – A decision should be taken in the General Assembly of IOC, where all countries are represented. To this end a draft resolution has to be prepared. The major obstacle is the detailed information required (cf. Art 248) long (in practice at least 2 years) in advance. It is clear that the information cannot be the same as in art. 248, as this is difficult enough for the present deadlines. The way around could be that 'as much information as possible' should be annexed, that should be completed as soon as it becomes available, and should be notified to the coastal states involved.
Par. 3 – The draft resolution and its Annex are to be prepared by the appropriate body, to ensure adequate participation in the discussion in an early stage of all member states involved.
Par.4 – Still the notification should be submitted at least six months in advance, plus the text of the resolution and the Annex with all the information. This seems to result in a sort of double procedure.
Par-5. – Repeats 248 – implied consent. Still the Coastal State has the possibility to object within 4 months after submission, but only for certain specific and recognized reasons.
Par. 6 – Refers to an IOC regional body when the planned marine research is in its geographical scope.
Par. 7 – Applicability of art. 253.
Par. 8 – Non member state of IOC.
Par. 9 and 10 – No prejudice for the rights, jurisdiction and duties of the States under the Convention.
The conclusion is that the main problem remains the detailed information to be given as specified under art. 248, and the early stage this information is needed. One of the main points of discussion was the extent to which it would be practicable to require, for the application of this procedure, the availability of all the information normally submitted to a coastal state when applying for consent, at the time of the adoption of a resolution by the IOC Assembly approving the MSR for this purpose (see section 2 of the draft procedure).
Many comments and suggestions on this point were given by ISOM members.
Prof. Kortum (Germany) stated that 2 year in advance is not feasible. This should be a shorter notice. In his view the whole operation would only make sense if it would reduce bureaucracy. *Prof. Soons* replied that a big group within ABE-LOS insists on having all information. *Prof. Nixon (USA)* commented, that if extra complications would evolve, it would be better to leave the procedure. He asked whether the IOC would be the only international organisation, or could there be others. According to *Prof. Soons* other organsiations could also apply such internal procedures. He mentioned ICES. *Ms. Rietveld (Netherlands)* mentioned that from the EU there had been initiatives to come to an overall outline of the planned research, and fill in the precise information later. *Prof. Soons* replied that he doubted there would be any support. As far as he knows there is little interest from research states. *Ms. Lahdes (Finland)* added that for research in Russian waters the lead time has again be brought to 6 months. She mentioned the problems with the requirement for reporting. *Prof. Soons* remarked that it is also difficult to comply with the art. 249 requirements. He has the impression that by trying to simplify, the procedure tends to get more complicated. The rule is that the flag state submits the application, which not necessarily is the research state. *Mr. Smits (New Zealand)* doubted the practicality of the issue. *Prof. Soons* replied that during the last 5 – 6 years the IOC has dealt with the issue each meeting. So members are interested. *Ms. Rietveld (Netherlands)* wondered whether the interest came from the member states or from the representatives. It only would make sense if it would give a solution. *Ms. Dieter (USA)* added that the devil is in the details. Most funding systems for research can only grant research money 1 year in advance, and not earlier.
ISOM members were requested to contact their ABE-LOS members and express their concerns regarding the issue.

9. INMARTECH 2002

Dr. Hiroyasu Momma (JAMSTEC, Japan) gave details on the programming for the INMARTECH 2002 and presented practical information on transportation from Narita Airport to Yokohama and on the splendid hotel accommodation,. The workshop will take place from 7 – 11 October 2002. The Venue: Headquarters, Japan Marine Science and Technology Center (JAMSTEC) in Yokosuka, Japan. He showed some highlights of the Yokosuka and Natsushima area for sightseeing.
Dr. Momma offered a view into the presentation rooms and in the Kaikyu-An:Hermitage of Ocean sphere, where a tea ceremony will be held.
There are 84 registered participants. The number of oral presentations is 42 and there are 25 poster presentations.
There will be key-note speeches on R/V MIRAI's around the world cruise and on the unique ROV application for the recovery of the sunken EHIME MARU.
There will be a facility tour and a visit to the Yokohama Institute for Earth Science with its Earth Simulator and an excursion is organised to the National Museum of Emerging Science in Tokyo.
Every speaker is asked to send in his abstract before the workshop starts, and it is expected that the proceedings will be ready within a few months.

10. OCEANIC Research Vessel Information and Schedules Database

Mr. Douglas White (OCEANIC - USA) gave background information on Oceanic and the fact that Oceanic is the Ocean Information Center. OCEANIC specializes in taking multi-national and multi-institutional programs and providing a portal to their operations and their data holdings. In performing this function for the World Ocean Circulation Experiment (WOCE) and now GOSIC (Global Observing Systems Information Center), Oceanic has tested and developed different means of collaborating and cooperating with the countries and institutions involved in these programs.
The International Research Vessel Schedules and Information website has historically worked as a partner for countries and international ship operators in those countries to make information about their research vessels and schedules available to the international community. A representative of Oceanic has attended many of the ISOM meetings and has requested that the ship operators attending the meeting send their ship schedules and specifications updates to Oceanic via mail or via online web forms. However, over the past year or so, it has proven beneficial

to get in contact with the programmers and coordinators who assist the vessel operators in coordinating their ship time and resources. A recent collaboration with the programmers for the UNOLS fleet allows a tab-delimited file with an entire years' scheduling to be automatically sent to the Oceanic site via email whenever a change is made to the schedule for any of the UNOLS vessels. Similar collaborations are being sought with other governmental and educational institutions in the US. Oceanic would like to expand this collaboration to allow for behind-the-scenes updates to be done on the Oceanic database by international research vessel operators as well. So the tactics for the coming year will be to work with programmers or departments within your institutions to facilitate updates to the research vessel schedules.

Another direction that Oceanic is taking is the linking of cruise schedules and ocean areas to the data that was collected. This endeavor is currently not funded under our current grant and is being investigated as to where to obtain funding to continue this effort. The database has been expanded to allow for funding organization/agency, proposal/grant number and whatever multi-national/multi-institutional program that the particular cruise is linked to (i.e.: HOTS cruises). Regarding ocean areas, research is still underway as to the feasibility of using IHB sea areas instead of the US Navy Grids currently being used. As many of the European partners are filing ROSCOP reports using these sea areas, it looks like that will be the direction that we will take.

Research is also underway to create a global data search mechanism once the past cruise schedules are obtained and imported from all countries. Due to the global nature of many of much of the research that is being performed, a given ocean area might have been visited and sampled by many different researchers from many different institutions and many different countries. A centralized means does not appear to be in place to allow a user to sit down and do a geographical search that would give them all of the research and experiments that have been performed in a given location. If our schedules of past cruises can be updated, that type of data access and search mechanism could become a reality.

Finally, OCEANIC has been in contact with Benjamin Simms of the IOC and Laurent d'Ozouville of the EurOcean Portal. We are pleased to see interest in developing a European Research Vessel view and we would be happy to work with our European partners in this endeavor. The logical approach that comes to mind is the creation of a "Europe" view, similar to the "UNOLS" view, that shows only those vessels from Europe. In discussions with Benjamin Simms earlier this year, it seems wasteful if not impossible to try to maintain accurate records in two or more locations, so I proposed that they use their resources and contacts in Europe to assist us in getting the European research vessels specifications and schedules up-to-date and to aid us in getting a regular transfer of updates so that all may benefit.

11. OD 21 (Riser Drilling Vessel CHIKYU)

Mr. Chijiya (JAMSTEC- Japan) informed the attendees on the progress of the OD21, the scientific riser drilling programme, and IODP (Integrated Ocean Drilling Program) and the launch of the Japanese riser deep sea drilling vessel CHIKYU (pronounce shjeekjúe), which means Planet EARTH. The OD21 riser drilling vessel will be the biggest scientific drilling vessel ever. LOA 210 m, width 38 m, draught 9.2 m, gross tonnage 57,500 t, max. complement 150 persons. The launch and inauguration (naming) ceremony took place on 18 January 2002 at the Tamano Works of the Mitsui Engineering and Shipbuilding Co., Ltd. The ship inauguration was performed by her Royal Highness Princess Sayako. There were about 3200 spectators, and among the guests were the Parliamentary Secretary of MEXT, the Governor of Okayama prefecture and Directors of NSF. Mr. Chijiya showed a video clip of the ceremony. Due to a 7.5% reduction in the 2002 FY budget the time schedule of the construction has been extended with 24 months till 2006. CHIKYU is planned to be engaged in a scientific drilling operation at the end of 2007 after a 1.5 years shake-down cruise. JAMSTEC asked the Government for a supplementary budget (40% increase) in FY 2003. The decision on this will be end of December, but as economy is going down, and there are many such requests, JAMSTEC is not optimistic about the outcome.

Mr. Chijiya recalled the history of ocean drilling, starting in 1961 for the Deep Sea Drilling Project (DSDP) with the first deep sea drilling ship: CUSS-1, then in 1968 the GLOMAR CHALLENGER followed. In 1975 the International Phase of Ocean Drilling (IPOD) started and in 1985 the Ocean Drilling Program (ODP) started with the drilling vessel JOIDES RESOLUTION. In 2003 the IODP will formally start and there will eventually be two drilling vessels, the Non Riser Drilling Vessel of the USA and the CHIKYU of Japan.

12. IMO regulations in high latitudes

12.1 Arctic Rules

Prof. Jorma Kämäräinen (FMA – Finland) gave a presentation on the Arctic Guidelines for Ships Operating in Arctic Ice-Covered Waters (over 60ºN and over 70-74ºN for areas under influence of the Gulf Stream). The guidelines are developed by the IMO with the purpose of better safety and prevention of pollution in accordance with SOLAS. Shipowners as well as designers and constructors are involved in respect to the operation of ships. The need for such rules in addition to the existing IMO rules is evident. It regards remote areas, where most of the year there are poor weather conditions, deep cold, ice loads, lack of good charts, and poor communication.

The lay-out of the Rules is divided in a General part, and 4 Parts: A – Construction provisions; B – Equipment; C – Operations; D – Environment protection and development.

Under Part A there are ice-strengths classes divided from PC1 – PC7. PC1 is the highest class, i.e. year round operation in all Arctic ice covered waters. Most R/Vs are Polar Class PC6 and PC7, this corresponds to (Baltic) Ice Class 1A Super or 1 A, or within the ASPPR A and B, and Russian Register ice classes UL and L1. Further comparisons are: Bureau Veritas: AS and 1A, DNV: 1A* and 1A, Nippon: 1A Sup and 1A, and ABS: 1AA and 1A.

Ships should have the structure in accordance with their Polar Class. Further provisions regard Subdivision and Stability and Stability in damaged conditions, Accommodation and Escape Measures for life sustainability in emergency conditions, Anchoring and

Towing arrangements, and Main Machinery and propulsion, Auxiliary Systems and Electrical installations.
Under Part B, there are chapters on Fire safety and Life-saving and Survival, as well as Navigation Equipment with regards to magnetic variation, gyro-compasses, and the requirement for two functionally independent radars. Further Automatic Indication System (AIS), manually operated red flash lights for escort operations.
Under Part C, the requirement for operating manuals, risk management, training, drills and emergency instructions, as well as requirements on crewing and emergency equipments, spares, repairs, reserve supplies, medical kits.
The Environmental protection under Part D, gives guidelines for damage control in response to limited response capabilities, lack of repair material and reception facilities of pollutant cargoes.
In December 2002 the Guidelines will be approved in the 76th session of the IMO Maritime Safety Commission and the Marine Environmental Protection Committee. The Rules will be proposed to members as a recommendation to their Governments.
The IMO draft MSC/MEPC circular (DE 45/27/Add.2) of 1 July 2002 was available as a hand-out.
The Canadian view regarding the IMO guidelines, and the retainment of the Canadian Ice Regime System, as well as the Canadian Arctic Waters Pollution Prevention Act were laid down in writing by *Mr. Steve Peck (Canada)* and distributed to all attendees as a hand-out.

12.2 Antarctic Rules

Dr. Henrik Sandler (FIMR – Finland) informed ISOM on the development of the Antarctic Guidelines. The first initiative came from Germany on the 59th meeting of the IMO MSC in 1991, where-after, by an outside working group of the Sub-Committee on Ship Design and Equipment (DE), the polar code for the Arctic and Antarctic community was drafted. This first draft had many shortcomings. It appeared that there were many inconsistencies with the UNCLOS, MARPOL and SOLAS or duplications, moreover it was too prescriptive, and not drafted as guidelines, and it was only applicable to ice-free areas. In 1999 the MSC drafted a new set of rules, that were the start of the Arctic guidelines. The Antarctic was left out. But at the COMNAP XIII meeting in Amsterdam in August 2001, the decision for the development of Antarctic shipping guidelines was taken, also triggered by increasing tourism. An informal sub-group was formed (SHIPOPS) to put forward the key Antarctic Shipping issues and answer some questions on the applicability of the draft IMO Arctic Guidelines to the Antarctic. Their conclusion is that the existing draft IMO paper could also serve for the Antarctic provided some changes would be incorporated. These were: rename the document Polar Shipping Guidelines, include the area South of 60ºS, and change "ice-covered" into "in which sea ice concentrations of 1/10 coverage or more, which pose a structural risk to ships", to change paragraph 3.3.2. regarding double bottoms, to where these are functional to prevent pollution, to reformulate in Chapter 11 the paragraph on survival equipment, that sounds too prescriptive, and add appropriate alternatives for the Antarctic conditions. Further the Ice navigator qualifications should also recognize on the job training as a substitute for a formal training programme, and removal to a maximum extent of abandoned ships should be added, taking into consideration the factors of human safety and environmental impact. This could lead to removal of contaminating materials instead of removal of the whole ship.
These suggestions will be given to the IMO before decision on the Arctic Guidelines are scheduled in December 2002. *Mr. Nieuwejaar* asked why the Regulations had been changed into Guidelines. Whereas *Prof. Nixon* postulated that Guidelines become Regulation as soon as insurers require to comply. *Dr. Sandler* answered that the guidelines are for new vessels and do not apply to existing vessels. Regarding the question where to get training, *Mr. Smits* remarked that there are already formal training in Canada, Toronto.

13. ISM Code – the next steps

Mr. Per Nieuwejaar (Norway) recalled that 1 July 2002 was the deadline for ISM certification of cargo ships above 500 grt. Still it is not absolutely clear whether ISM certification is mandatory or not for state owned RVs over 500 grt!
It is a fact that not all ISOM members have the ISM certification in place.
From the implementation of ISM, the Institute of Marine Research (IMR) in Norway had learned that safety awareness on board and ashore among sailors had improved, that quality of service by RV department personnel and scientific personnel on cruise had improved, and that crisis management capability in the RV department and at IMR had improved. Every nation has a set of laws, rules and regulations concerning the health, safety and welfare of the workers which every company has to adhere to. At the IMR we see the Occupational Health and Safety (OH&S) Management System as a complementary system to the ISM code, both for the sailors and the cruise personnel.
The challenge is to harmonize the two systems and merge them in to one efficient Safety Management System.
The vessels filed 108 SAFIR and OH&S reports in 2001 and 90 reports per 10 September 2002 concerning health and safety issues. This proves that the sailors are keen on this and that the system is working!
What about the next steps? These no doubt will relate to the scientific operations on board. IMR started on standardizing and describing procedures, but this is not a simple task. The question is whether ISOM members should follow the NERC Risk Assessment for key operations as laid down in the Principal Investigators Guide. Should we have Goal and Result Indicators related to a policy statement (target indicators)? This is not only difficult to formulate, but also difficult if not impossible to measure. Perhaps the combination of ISM with ISO regulations added to the SSTW manning system and/or OH&S system gives sufficient guarantee for quality and safety assurance.
Mr. Conor Mowlds (Ireland) added that risk assessment for fishing is problematic. The conclusion would be: don't do it. Consulting with Lloyds it came out that Lloyds comes to the same conclusion. *Mr. Frode Larsen (Denmark)* remarked that Denmark had tried to describe the fishing activities, and then it was evident, that there would not be a Designated Person (DP) to be found to be the responsible person ashore. *Prof. Dennis Nixon (USA)* brought forward that there exist guidelines for safe regulations for fishing

operations in the North Pacific. They can be found on the internet.
The most damage is hand injury related to handling nets and winch operation. *Ms. Marieke Rietveld* remarked that a DP could exist of more than 1 person. This is the case at NIOZ, and can be discussed with the classification bureau.

14. Update on Safety and Security issues.

14.1 Piracy Problems

Ms. Rietveld (Netherlands) gave an update on the piracy issue and showed an overview of the attacks in various parts of the world as issued by the ICC International Maritime Bureau. As usual the champion is the far east with the Malakka Strait and Indonesian waters. ". She referred to the ICS/ISF publication: "Pirates and Armed Robbery: A Master's guide. Special attention was drawn to the Marine Guidance Note No. 75 of the UK Department for Transport Shipping regarding Piracy and Armed Robbery with recommended practices. Evidence has grown since last year that the security issue is more than piracy. In the US this awareness was an incentive for UNOLS to install a special web page regarding safety and security/piracy and terrorism. The address is:
http://www.unols.org/rvoc/security.html
The International Chamber of Shipping has issued new guidelines how to deal with terrorism in shipping: "Guidance for shipowners, ship operators and masters on the protection of ships from terrorism and sabotage".

14.2 War Zones.

Relevant information can be found on the UNOLS site and on http://travel.state.gov/warnings_list.html

15. Round the World cruise Plan of R/V MIRAI

Mr. Chijiya (JAMSTEC – Japan) presented the Round the World Cruise Plan of R/V Mirai. This cruise was organised as a part of the 30th anniversary of the founding of JAMSTEC and following up the São Paulo Declaration of POGO (Partnership for the Observation of the Global Oceans): "the Participants of POGO call upon the world leaders of government, industry, science, and education to use their influence and resources, within their own countries and through relations with others, to devote necessary attention and appropriate resources to extending ocean observing systems in the Southern Hemisphere, as a minimum requirement towards implementing an integrated strategy for observing the global oceans."
JAMSTEC invited 20 institutions that are leading in ocean sciences in the world for the 30th Anniversary, on which occasion the Yokosuka Statement was signed: "We believe that the following approaches are important in order to develop a greater understanding of the unknown frontier, the Sea, and to predict global environmental changes" and "Improving systems for observing unknown areas, such as the deep bottom, polar regions and Southern hemisphere".
JAMSTEC organised this Round the World cruise in the Southern Hemisphere with R/V MIRAI to gain knowledge on the key role of the Southern Ocean in the world climate. Water mass transformations in the Southern Ocean "close" the overturning circulations by converting deep water into lighter intermediate waters and denser bottom waters. The Antarctic Circumpolar Current connects the ocean basins and allowing anomalies to propagate between basins and influence the climate "downstream".
Mr. Chijiya gave an outline of the planned cruise: Six legs (4 legs for full WHP, 1 leg for coring, 1 leg for BGC in the Antarctic Sea). Every station includes a surface-to-bottom CTDO cast equipped with 36 bottles of 12l 493Times, LADCP, a fluorescence meter and a transmission meter. The sampling parameters will be: Sal., DO, Nuts, CFCs, TAlk, DIC, DOC, pH, 14C, 13C, 3He/4He. Underway measurements are pCO2, surface T, S, ADCP, multi narrow beam, geo-magnetism, and meteorology. All data should be opened through WHPIO and JAMSTEC within two years after each leg.
The cruise will start in August 2003 in Brisbane (Australia) for leg 1, then Tahiti – Valparaiso (Chile) for leg 2, from Valparaiso to São Paolo (Brasil) for leg 3 (including coring), leg 4 from São Paulo to Cape Town (South Africa), and leg 5 from Cape Town to Fremantle (Australia). The 6th leg will be Fremantle-Fremantle for biogeochemical work. The cruise will last until February 2004.
To accomplish this major cruise JAMSTEC needs the support of marine technicians all over the world and scientists from the regions. During INMARTECH 2002 next October all participants will be invited to join in and support the cruise.

16. Standardization of laboratory vans/containers

Ms. Dolly Dieter (NSF/UNOLS – USA) referred to the work of Matthew Hawkins (hawkins@udel.edu) who is the UNOLS expert on lab van standardization. A UNOLS van manual has been developed, and can be accessed via the webpages of UNOLS (www.unols.org/rvoc/vanspec.html).
The incentive came, when after some site surveys it appeared that the lab vans used were of poor quality. Basically no more than cargo vans with some benches. The decision was taken to upgrade the quality and to come to standardized specifications. NSF received many Shipboard Scientific Support Equipment (SSSE) requests for various type of vans, and decided to have a group purchase from the view point that 'one size fits all', and that the vans should be USCG approved and SOLAS inspected. The effort was successful, and Ms. Dieter listed the cost of various van types, completely equipped:
Clean Container 65,000 USD, Isotope Container 65,000 USD, Aluminum Isotope Container 75,000 USD (more expensive, but lighter, and less maintenance), Electronic Container 65,000 USD, and Chemical Storage Container (USCG inspected) 65,000 USD, General lab van 75,000 USD and Refrigerated/Thermostated 80,000 USD.
All have in common that the lay-out provides an escape hatch, and two side doors, as well as port lights at both sides. All are made of stiffened corrugated steel. (except the Aluminum). Only the vans for Power, Electronics and Accommodation need to be USCG approved.
Now a fleet-wide inventory of "all" vans have started. Those that are cargo vans with nothing extra will go out. A van pool will be established and a user charge will be levied. Replacement and maintenance will be standardized.
After a question on requirements for noise levels of *Mr. Per Nieuwejaar*, *Ms. Dieter* answered that UNOLS is working on that now. *Mr. Falk von Seck* remarked that for H_2S containers there are extra requirements, that make such a van very expensive. *Mr. Douglas White* remarked that

attention should be given to electrical requirements for computer connections.

17. Recovery of sunken moorings by entangling device

Cpt. Masataka Zaitsu (NME – Japan) reported on the recovery of a sunken mooring with an entangling trawl rope device that was initially developed by Mr. Hiroyasu Momma in 1979 and further developed as a rescue system for SHINKAI 6500. Every year a rescue drill is held after dry-dock, and this time there was an opportunity to use the drill operation for the recovery of a sunken non-responding transponder. The entangling device consists of 8000 m 16 mm steel towing wire, 400 m 26 mm nylon trawling rope with 5 grapnels, 6 floats, 2 transponders, a pivot chain and a depression weight of 450 kg.

The device proved to be very effective by the use of two transponders to record the 'catch' of the mooring, and the nylon trawling rope with grapnels to bring the mooring to the surface intact. The transponder that had to be recovered was part of a 63 m mooring system, the transponder itself 20 m from the seafloor at a depth of 5100 – 5200 m, 80 nm from the Sanriku coast of Japan.

The way of catching in itself is simple: Lower the Entangling Device as deep as target. Then let the surface vessel go on a circular course towing a long cable. The towing cable end does not follow the circle of the surface vessel but goes on a smaller circular course. The entangling rope (device) attached to the cable end, with a pivot weight on another end of the rope, trawl around the pivot weight. When there is target in this trawling area, the trawling rope will entangle it. Because of the great depth some modifications of the system were added, with an extra float at the transponder at the far side of the trawling rope (pivot chain transponder), and a 'weakling' (fuse-rope) between the transponder and the weight. From calculations it was clear that for a circle with a radius of 400 m (between weight and end (pivot chain) transponder) on the seafloor, the ship on the surface had to make a circle with a radius of about 1350 m. (2600 – 2700 m diameter). The ship (R/V YOKOSUKA) did so three times. *Cpt. Zaitsu* showed from the records of the transponder patterns the moment that the catch is hit. This was during the second circle, where the third circle served as proof. The operation for the recovery was completed in 8 hours. The modifications proved to be a great success.

18. Insurance and Liability - Update on world Insurance and Legal and Liability issues

Prof. Dennis Nixon (NSF/UNOLS - USA), the Risk Manager and Legal Advisor for the US UNOLS fleet, gave an overview of legal issues relevant to research vessel operations, and of the current status of marine insurance industry and rates. He also discussed the impact of terrorism on vessel operations.

Regarding the legal issues he discussed the following:

1. Validity of charter party hold harmless agreements, as the so called 'knock for knock':

A question was raised by Mr. Fred Smits of NIWA, New Zealand, whose Charter Party Agreement, has a 'knock for knock' waiver of liability regarding vessel and NIWA equipment and client's equipment or personnel. This is accepted policy for charter contracts where parties may stipulate that each side will bear their own losses and will design their insurance programs accordingly. Mutual release or hold harmless agreements are dependent on the jurisdiction of the local authorities, but are recognised by the courts of most maritime nations.

2. Impacts of acoustic research on marine mammals in US waters:

Following incidents of stranded marine mammals in relation to sonar usage, and the acknowledgement by the US Navy that the use of low frequency sonars could cause harassment to marine mammals, a public debate has started in the US. NOAA who is responsible for the enforcement of the Marine Mammal Protection Act (MMPA) exempted the Navy, and granted permission for the use of these systems over a five year period, subject to annual review. However, the Natural Resources Defence Council filed suit to block the deployment of the system. This high sensitivity regarding the use of sonar, also affected the geophysical work of R/V MAURICE EWING, using airguns off the coast of Mexico.

3. Enforcement of the ISM Code

According to IMO representatives evidence is mounting that the impact of ISM implementation has a positive effect. We did hear this already from our Norwegian colleague. Also the Swedish P&I Club compared the number of claims in 2000 for ships under ISM since 1998 and non ISM certified ships that would have to comply as per 1.7.2002. The decline was about 30%. From a questionnaire issued by another Club to seafarers, it came out that the mound of paperwork made them unhappy. The time needed could sometimes only been found when on watch! Here we can see the law of unintended consequences at work.. Another unwanted consequence is fraud with ISM certificates and DOC's issued by obscure authorities.

4. Vessel safety issues

Life-boat drills are required by the ISM Code. This has led to a number of accidents caused by unsafe practices or equipment failure. From the Australian Transport Safety Bureau (www.atsb.gov.au) measures are detailed that should be taken before life boat drills occur. Also reported accidents with small launches call for safety standards for operating small vessels often used by universities and manned with inexperienced crew.

Regarding insurance Prof. Nixon recalled his speculation that the scope of the Sept. 11 insured losses would be in the range of 50 billion USD. Now claims are around 30 billion USD, and uninsured losses are estimated at approx. 50 billion USD. Combined with the high tonnage losses in 2001 (the highest since 1994 despite the ISM Code) the impact on vessel coverage and rates is considerable. Average premium raises in the US are 20 – 35%, and this increase is likely to continue in the coming years. The solvency of insurance companies is another issue, and purchasers of insurance should watch this issue seriously. Another concern is the exclusion of terrorism, which first occurred in the UK following the IRA bombings in London in 1992. Rates for war-risk insurance have also risen sharply, which poses the question whether R/V's should enter areas where war-risk cover is required.

The consequence of terrorism on R/V operations is not only evident in insurance, but will have serious impact on safety and security regulations in ports. Especially containers are a weak link in the security chain. After the attack last year on R/V MAURICE EWING off Somalia, UNOLS is seeking

the availability of intelligence sources for cruise planning. Also the question is discussed how to respond to armed violence.
A detailed overview of the issues discussed was distributed as a handout.

19. IMO regulations on crew and seafarers

George Angas of VTis (Vosper Thornycraft Ocean Sciences – UK) was invited as a guest speaker. He has 14 years of experience at sea, and 21 years in maritime education and training. After a short introduction on the IMO Mr. Angas talked on various issues. The IMO has more than 160 member States, employs 300 officials and has an annual budget in excess of £18.0 m. After World War II it was realised that there was a need to strengthen international co-operation within the maritime transport industry (mti). This resulted in 1948 in the Economic and Social Council of the UN (ECOSOC) convened a maritime conference in March, which developed a convention setting up The Inter Governmental Maritime Consultative Organisation (IMCO) in 1958. This was changed in 1982 into the International Maritime Organisation (IMO). The IMO structure comprises an Assembly of all member States who meet in regular sessions once every two years. A Council, set up to arbitrate between the different factions of the membership i.e. traditional maritime States V emergent and 'service supplying' States. It now comprises of approximately: 10 Ship-owning States, 10 Chartering States, and 20 States, that will provide a geographical balance. Most of the major powers of the IMO are assigned to the Council and manages all IMO functions between Assembly sessions. There are various committees, such as:
Maritime Safety Committee (MSC). Nine sub-committees currently exist to consider existing and emergent safety issues that arise from time to time. It meets once a year.
Legal Committee (LC). Open to all IMO members operates on the same basis as the MSC.
Marine Environmental Protection Committee (MEPC). Consists of members from all member Sates and is empowered to consider all matters of prevention and control of pollution arising from ships.
Technical Co-operation Committee (TCC). Consists of all members and considers how best to implement technical co-operation projects.
Facilitation Committee (FC). Open to all members and eliminates all unnecessary red tape and paperwork.
The Secretariat of IMO consists of the Secretary General and all the 300 strong technical and administration staff working from the IMO HQ in London.

19.1 International Standards of Medical Fitness for Seafarers.

Pre-emptive is that as soon as people board a ship they have a responsibility towards their colleagues and the ship, irrespective of regulations. Further the following conventions are applicable:
IMO, International Convention on Standards of Training, Certification and Watch-keeping for Seafarers 1978 as amended in 1995 (STCW 78/95).
ILO, Merchant Shipping (Minimum Standards) Convention, 1976 (No 147).
ILO, Medical Examination (Seafarers) Convention, 1946 (No 73).
Regarding medical certification all countries that are signatories to the above conventions are required to issue medical certificates that are in compliance with Article 2(a) (iii) of ILO (147) under regulations accepted as equivalent to (No 73). The STCW Section B-1/9 and Circular (STCW.6/Circ.5- 26th May 2000)
(Guidance regarding medical standards – Issue and Registration of Certificates) apply. Rules for medical examination and certification are: Differentiation – Between beginners and experienced seafarers; Objective Criteria – Defined for 'fitness for sea service'; Particular medical conditions – That could disqualify seafarers from holding specific posts on board a ship should be defined, e.g. colour blindness; Recognised Medical Practitioners – The administration should publish a list; Minimum in-service eyesight standards – Should be produced by Administrations. (See B-1/9); Those needing to wear spectacles/ contact lenses – should always have a spare set on board. If needed to meet minimum standards, then should be recorded on certificate; Disease – Eyes should be free of disease. Any permanent or progressing debilitating pathology without recovery should be a cause for unfitness; Tests for visual fitness – Should be reliable and performed by a reliable person recognised by the Administration; Higher Standards – Than those defined in B-1/9 may be required by some Administrations.
There has been an increasing awareness during the last decade that a large proportion of marine accidents has occurred due to 'human failure'. In many instances human failure has been as a result of fatigue. Fatigue has been the result of seafarers working excessive hours without any rest, ergo, regulate seafarers max/min hours of work/rest. Fatigue is a main cause of human failure. In this respect RVs do not differ from other vessels. Therefore ILO/EU rules on working hours and minimum hours of rest.

19.2 ILO 180/EU-regulations on working hours.

Seafarers hours and the Manning of Ships Convention, 1996 (No 180), the IMO STCW 75/95 Section B-Vlll/1 and the EC Council Directive 1999/63/EC, as well as The Merchant Shipping (Hours of Work) Regulations 2002
(SI 2002 No 2125).
Regulations will identify those vessels to which they apply and usually tend to exclude: fishing vessels, pleasure vessels and offshore installations (when on their working stations), tugs (operating within harbour limits).
Minimum hours are regulated as follows:- Ten hours in any 24-hour period; and 77 hours in any seven day period.
The above hours may be divided into no more than two periods, one of which shall be not less than 6 hours in length and the interval between such consecutive periods shall not be > 14 hours.
Exceptions to MhoR: musters, fire fighting and lifeboat drills, legislation that applies to 'specialist' vessels e.g. fishing vessels; On call' compensation periods; Collective/workforce agreements, More frequent/longer leave period allowances, Shipboard emergencies.
Provision of information are that the master of a ship is required to post a schedule of 'hours of rest' in a prominent and easily accessible place in the ship in the working language of the vessel. The master shall instruct that detailed records, endorsed by him and copied to individual seafarers are kept. No NtW for those under 18 unless under training. Night time shall mean a duration of 9 consecutive

hours, which include the period 00:00 – 05:00 hrs (local time).
Entitlement to Annual Leave: A seafarer is entitled to paid annual leave of not < four weeks in any employment period of one year or pro-rata for less than a year. This can be taken in instalments and cannot be replaced by payment in lieu unless it is a termination agreement.
Inspections, offences and penalties will all be identified in national regulations.
The criteria for the development of workforce agreements to be clearly spelt out in the regulation.

19.3 Safety and Training

Safety and training is always seen as expensive. If you think safety is expensive try operating ships without it!
Mr. Angas showed the case of the RV OCEAN VOYAGER. This was a survey vessel built in Canada in 1974 and reconfigured in 1994. (LOA 60.20 m, width 13.72 m, draught (max) 5.28 m., endurance(max) 40 days).
In early August 2002 the ship sank off Iran in the Indian Ocean in calm seas with good visibility. What happened was that a chain snapped of the USBL pool hatch below, and water entered the engine rooms, while there was no lid, and the force of the water was so high that the watertight doors were leaking, when by helicopter emergency pumps were flown in, two out of three got clogged. Eventually the ship sank. Happily there were no casualties and all men could be evacuated by heli. The question was Why?, and what lessons can we learn from this? ISM was implied, including the training of the crew in high tech environment. The STCW Code such as: The International Convention on Standards of Training, Certification and Watch-keeping for Seafarers 1978, as amended in 1995(STCW Convention), Seafarers' Training, Certification and Watch-keeping Code (STCW Code), A mandatory standards, and B recommended guidance was implied to the OCEAN VOYAGER crew. However, no proper risk assessment had been carried out. In the sense of: what if a chain snaps of the USBL pool?
Scientists on board are categorized 'supernumeraries'. It is evident that a certain amount of training is essential, also for their own safety and for that of their colleagues. At least: a certain minimal standard training regarding fire response, liferaft, mustering etc. This is however, not mandatory by regulations. Mr. Angas would strongly recommend to develop an RV Code under the STCW regulations for science teams on board RVs.

20. Ship manning and crew training

Mr. Per Nieuwejaar (Norway) and *Ms. Eila Lahdes (Finland)* have prepared a questionnaire that has been distributed to all members. The strong request is to fill in the form and return this electronically to either person.

21. Any Other Business

21.1. Attendance Fee ISO Meetings

The issue was addressed last year. Especially to give less wealthy countries the opportunity to host an ISOM. It was agreed that to cover the costs for meals and excursion a fee up to a maximum of 100 USD was acceptable.

21.2. Investment costs/Replacement costs

ISOM could serve as a platform for keeping track on investment and replacement costs for RVs.

22. Date and Place of Next Meeting

All ISOM members present were in favour of continuation of ISOM.
No venue for next year was fixed yet, and in accordance with ISOM customs the host for next time should preferably be in a non European country. Chile had often suggested that it would like to host an ISOM. Unfortunately the Chilean representative Mr. Enrique Aranda could not attend this year. The secretary promised to send out a request to Mr. Aranda, and *Dr. Andrew Forbes (CSIRO - Australia)* kindly suggested to contact his colleagues in Chile. *Mr. Eric Walker (Smit Pentow Marine – South Africa)* offered that South Africa would back-up when Chile could not host the meeting. This was gracefully accepted.
After some words of thanks to the Finnish hosts for the most generous hospitality - including a highly enjoyed and very memorable sauna experience - the meeting was adjourned.