

Twelfth International Research Ship Operators Meeting

13-15 October 1998, San Diego, California USA

Attendees:

Country	Representative	Organisation
Belgium	Mr. M. Andre Pollentier	MUMM, Oostende
Chile	Mr. Enrique Aranda	IFOP, Valparaíso
	Ms. Catalina Gallardo	SdP, Valparaíso
Denmark	Mr. Mogens Busse	DFU, Kopenhagen
EU	Mr. Gilles Ollier	DG XII, Brussels
France	Mr. Jean Xavier Castrec	IFREMER, Centre de Brest
	Cpt. Armel Le Strat	GENAVIR, Paris
Germany	Dr. Dieter Stroh	RFG, Bremen
Japan	Mr. Masato Chijiya	JAMSTEC, Yokosuka
	Mr. Masami Nakano	JAMSTEC, Yokosuka
	Cpt. Masataka Zaitu	NME, Yokosuka
	Cpt. Akio Nakagawa	GODI, Yokosuka
	Mr. Nori Kyo	JAMSTEC/SIO
Netherlands	Mr. Cok N. van Bergen Henegouw	NIOZ, Texel - Secretary
	Ms. Marieke J. Rietveld	NIOZ, Texel
OCEANIC	Ms. Katherine A. Bouton	UD, Delaware
South-Africa	Mr. Pedro Goosen	SFRI, Cape Town
Spain	Mr. José I. Diaz	CSIC, Barcelona
UK	Dr. Charles W. Fay	NERC-RVS, Southampton
	Ms. Caroline Harper	NERC-RVS, Southampton
	Mr. Robin A. Williams	Naval Consultant, Barry
USA	Dr. Don F. Heinrichs	NSF, Arlington - Chairman
	Ms. Dolly Dieter	NSF, Arlington
	Dr. Robert A. Knox	SIO, La Jolla
	Cpt. Warren K. Taguchi	NOAA, Seattle
	Ms. Sugata Millick	ONR, Arlington
	Prof. Dennis Nixon	URI, Kingston

Mr. Jim Hughes	GSR, Houston
Mr. Andy Bowen	Woods Hole
Mr. Tom Althouse	SIO, San Diego
Ms. Linda Eastman	SIO, La Jolla
Mr. Woody Sutherland	SIO, La Jolla

Apologies for absence:

Country	Representative	Organisation
Australia	Dr. John Wallace	CSIRO, Hobart
Canada	Mr. Steve Peck	DFO-CCG, Ottawa
Finland	Ms. Eila Lahdes	FIMR, Helsinki
France	Mr. Allan Cressard	IFREMER, Paris
	Mr. Laurent d'Ozouville	ESF, Strassbourg
Germany	Prof.dr. Gerhard Kortum	IM, Kiel
Norway	Dr. Roald Vaage	IMR, Bergen
UK	Mr. Brian Kay	CEFAS, Lowestoft

1. Welcome

Dr. Bob Knox, director Marine Operations of Scripps Institution for Oceanography (SIO) and chairman of UNOLS, welcomed all 30 participants from 11 countries and 2 international organisations to the twelfth ISO-Meeting hosted by SIO, NSF, ONR and NOAA. This year's ISOM is chaired by *Dr. Don Heinrichs of NSF*, who invited all participants to briefly introduce themselves.

2. Review of Minutes of Eleventh Meeting

The preliminary draft minutes were put on the ISOM Web site in March for comments and corrections. The latest version is available on the web site. (<http://www.nioz.nl/isom/>) The minutes were accepted as a true record of the eleventh meeting held in Barcelona, Spain on 6-8 October 1997.

3. Delegates Reports of Activities

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

Dr. Fay (UK) reported. The United Kingdom has some eight deep sea research ships operated by the public sector (i.e. Government funded). The Natural Environment Research Council operates four of these, namely: RRS DISCOVERY (3008 tonnes, 28 Scientists), RRS CHARLES DARWIN (1936 tonnes, 18 Scientists), RRS CHALLENGER (1050 tonnes, 14 Scientists), and RRS JAMES CLARK ROSS (5732 tonnes, 24+ Scientists). RRS JAMES CLARK ROSS is primarily used for the logistical and scientific support of the British Antarctic Survey bases in Antarctica. She does however conduct some scientific projects outside the BAS programme, usually in transit between the UK and Antarctica.

RRS DISCOVERY has had a full year of research cruises in the North Eastern Atlantic on behalf of a wide range of disciplines. The full capacity of her seismic compressors with 16 airguns was used in a seismic cruise utilising a new 96 channel Multi Channel Seismic System. Other disciplines supported have been EC-funded biology cruises, oceanography and chemistry/ atmospheric sampling. Although now showing her age, she is

functioning very effectively as the UK's largest multi-role research ship.

RRS CHARLES DARWIN has also had nearly a full year of research cruises, about half of which have been scientific charter cruises (as opposed to directly NERC-funded cruises). She has been operating in the Mediterranean and the North Atlantic, again for a wide variety of disciplines: marine biology, environmental impact assessment, seismic surveying.

RRS CHALLENGER unlike her programme for 1997 has not been in such demand. She has however been used for University post graduate student training cruises, a coastal geophysical survey and a physics cruise in the North Sea.

CHALLENGER is currently in major refit; DARWIN is shortly going to major refit and DISCOVERY undergoes recertification shortly (i.e. only minor refit).

Within the UK, the Scottish Office, Agriculture and Fisheries Department (SOAFD) has just taken delivery of a new oceanography/fisheries research vessel "RV SCOTIA". She is under trials at present. She replaces the 27 year old SCOTIA. The Ministry of Agriculture, Fisheries and Food (MAFF) of England have just been allocated funding to replace their 28 year old RV CIROLANA fisheries research ship.

As to plans for 1999 *Ms Harper (UK)* reported that RVS had been asked not to release the 1999 NERC Research Ships Programme until November 1998. This was because an NERC working group was currently looking at future research ship time requirements, and it was possible that their recommendations could impact significantly on the shape of the 1999 programme. The study had been triggered because one of the RVS ships, RRS CHALLENGER, was due to be replaced in 2002, and because NERC funding for research ship time had effectively declined in recent years. The situation was now that unless RVS generated significant charter income, there were no funds for capital expenditure.

There was demand for all three ships during the summer months, but sometimes little demand at other times. This was not cost-effective, and it inhibited RVS's ability to respond to charter opportunities, which often required fine weather windows. However, there was a need to keep three ships operational, to provide the geographical and technical flexibility required by scientists, and to cope with fluctuating seasonal and annual demand, depending on the requirements of major research programmes. The ability to participate in international joint programmes and ship time exchanges was another important consideration. It had therefore been agreed provisionally that RVS should reserve RRS CHARLES DARWIN primarily for charter activities during 1999; expressions of interest were invited. The NERC-funded science cruises would be moved where possible onto the other two ships, with the agreement of the Principal Scientists. If the working group recommendations did not preclude this strategy, the 1999 programme would be released in November. In future years the programme was expected to be released as normal in August.

Dr. Strohm (Germany) reported on the activities of the three big research ships RV POLARSTERN, METEOR, SONNE and the middle sized ships that mostly worked in the N.E. Pacific and N.E. Atlantic Ocean. In summer 1999 R/V VALDIVIA is 29 years old and will be taken out of service.

Within the new organisational structure since January 1998, a central ministerial committee handles the application procedure for ship time according to standardised rules. However, the vessels will continue to be affiliated to the institutions they belong to.

Mr. Chijiya of JAMSTEC (Japan) reported the launch of two new research vessels, the deep sea vessel KAIREI and the oceanographic research vessel MIRAI. A total of five ships are operational at the moment. Construction has also started on a drilling ship.

Mr. Nakano of JAMSTEC (Japan) reported on the fleet activities in 1998 of the support vessel YOKOSUKA, carrying the research submersible SHINKAI 6500. She is on a worldround cruise for the Mid Ocean Ridge Diving Expedition (MODE) 98, a programme in which Japan, the USA, the UK and France co-operate. The ship left port in May and is expected to return home in December.

Mr. Zaitzu of NME (Japan) reported on the 1998 activities and changes.

R/V KAIREI's main cruises are ROV KAIKO's diving research and Multi Channel Survey System research. This year, she was engaged in 4 KAIKO's cruises and 2 Multi Channel Survey cruises so far. One of the KAIKO's cruises was carried out off of the Hawaii Islands, and she made 3 port calls to Honolulu. This cruise was a cooperative research with School of Ocean and Earth Science and Technology in University of Hawaii. (See hand-out for details)

At the first port call, she got a Port State Control inspection of US Coast Guard. According to the US Coast Guard, they conduct inspection once a year as an annual inspection for all vessels which make port call to United States of America. They checked fire and abandon ship drills, reviewed the documents, and held an operational test of navigation equipments, steering gear, fire pumps, oily water separator, emergency generator. Further visual inspection of all lifesaving equipment, fire extinguishing equipment and fire detection system, marine sanitation device and overboard discharge valve. There was a tour check of deck and engine room spaces. (see hand-out titled Foreign Freight Vessel Examination by US Coast Guard in Honolulu).

At the 3rd port call to Honolulu, she had an open house on the pier in front of the Aloha Tower, and 1,765 people came to this open house.

Some alterations were made to the research ship KAIYO this year. These comprised the removal of 2 A-frame cranes from center well and starboard side, 2 cable winches for Submersible Decompression Chamber, 2 big sheaves for umbilical cables, 40 big gas bottles for saturation diving. As the 300m saturation diving project, New Seatopia Project, for which KAIYO was built, was completed in 1990, she has been used as an ocean research vessel. As a result of the alterations she got a wider working deck and her weight became lighter.

This year, on April 11th, SHINKAI 2000 achieved 1000 dives. Since the 1st dive in 1982, she has been engaged in a lot of research activities for 17 years not only in Japanese water but also in foreign water.

KAIREI and NATSUSHIMA are expected to be engaged in the research activity in January-March 1999 at the seismic center of the earth quake which caused the big Tsunami Wave that attacked north coast of Papua New Guinea with severe damage. As the first phase, KAIREI will conduct a research using Multi Narrow Beam and gravity meter from January 2nd to January 13th.

The second phase, NATSUSHIMA will be engaged with ROV DOLPHINE-3K from March 2nd to March 8th.

Mr. Nakagawa of GODI (Japan) reported on the new R/V MIRAI that is managed by GODI. MIRAI is designed for operations in high latitudes and polar seas under heavy weather conditions. She is a large vessel of 8600 GRT, accommodating 80. She has ice class of NK, is not an ice breaker, so operates mainly in summer in the Arctic Ocean. (Specifications on ship and Arctic Ocean cruise can be found in the hand-out and brochure).

Having completed this first operational year mainly on training cruises, she will have her first docking period, and afterwards is commissioned for collaborative research activities in joint cruises with several scientists from overseas universities and research institutions. The schedule for 1998/1999 is already fixed. (see hand-out)

Mr Castrec of Ifremer (France) reported on operations of four multi-purpose research vessels - R/V's L'ATALANTE, NADIR, LE SUROIT, and THALASSA.

There have been no changes in ships, but there have been improvements to their capabilities. Generally speaking, the renewal of equipment and facilities for oceanographic ships continued at the same pace as during previous years, with particular emphasis on the development of informatics technology systems.

R/V L'ATALANTE : An important multi-service network has been installed, the real time version of new Caribes software for processing echosounder and sonars data and also the post processing of the Caribes software. The ultra-short base line positioning system Posidonia was put on the vessel.

R/V NADIR : A new echo-sounder and the ultra-short base line positioning system Posidonia.

R/V LE SUROIT : The upgrading of the vessel is postponed to the first semester of 1999. In view of her

future modernisation a mid-depth multibeam echo-sounder, of the EM 300 type, is ordered.

R/V THALASSA : The same Caraïbes system that has been installed on R/V L'ATALANTE

The major change to the structure of Fleet Management has been the retirement of the Director Dr. Dominique Girard. His successor is Dr. Allan Ph. Cressard (PhD in Geology).

During 1998, IFREMER has run some 37 cruises on the four mentioned high sea vessels with disciplines roughly divided as follows: 7 geology, 10 physics and biology, 5 fisheries campaigns, 7 technology and equipment trials.

To these, 2 can be added for our Spanish partner of I.E.O. (Instituto Espanol de Oceanografia), 1 can be defined as a "charter cruise", 1 was for the government and 4 for scientific co-operation of which 1 for NIOZ with shiptime exchange.

1998 has seen R/V L'ATALANTE operating for 11 months, R/V NADIR for 9 months, R/V LE SUROIT for 6 months, R/V THALASSA for 11 months, in the North Atlantic (so far off the coast of Gabon) and in the Mediterranean sea.

The big event of the 1998 year is the first scientific - technological cruise of ROV VICTOR on the RV THALASSA in August (work of recognition, observations, sampling and in situ measurements) on 3 spots

- an sedimentary area, off Brittany coast, of more than 2000 m depth.

- a sedimentary area, off Portugal by 5 800 m

- an area of active hydrothermalism off the Azores (Lucky Strike site on the triple point of the Azores).

Mr. Aranda (Chile) reported on the Chilean scientific ship fleet composed of the vessels ABATE MOLINA, CARLOS PORTER and AGOR VIDAL GORMAZ. These operated during the present year exclusively along the extensive national coast.

The scientific ship ABATE MOLINA has developed 11 cruises which represent a total of 164 effective days in the sea. These investigations correspond to a contract financed by the Fund of Fishing Investigation (FIP) and the National Commission of Scientific Investigation and Technology (CONICYT).

The first organisation is aimed towards fishing investigation and aquaculture projects necessary for the adoption of administrative measures on the fisheries and aquaculture activities.

The cruises financed by the FIP during the year of 1998 correspond to the Dynamic space bathymetry of common hake, recruitment and prospecting of anchovy, evaluation and prospecting of jack mackerel over the 200 nautical miles off the coast and prospecting of the orange roughy resource.

It is important to highlight that all the investigations noted before have specially incorporated the study of bio-oceanographic conditions with the purpose of monitoring the presence of the "El Niño" phenomenon in the Chilean coast, in consideration of the strong impact that "El Niño" has on the fishing industry.

Meanwhile the CONICYT supports basic research work in oceanography with the development of an advanced studies program on the system of the Humbolt Current.

The modernisation of the scientific vessel ABATE MOLINA during the present year has contemplated the incorporation of equipment according to the norms established by the Global Maritime Distress and Safety System (GMDSS) by means of the acquisition of EPIRB Satellite, NAVTEK Receiver, VHF radio, Radar responder SART, Two-way VHF radio, Plotter and radars (two units of 120 nm and 60 nm). In the same way, it has been incorporated a CTD Mark III C in accordance with the WOCE standard and a mid-water trawl of HERMAN/HENGEL for the capture of anchovy and sardine recruits.

The scientific vessel CARLOS PORTER remains with port base on the North zone of the country, developing the monitoring bio-oceanographic conditions program and the mooring operations of the advanced Studies program in the system of the Humbolt Current with a total of 6 cruises which represent 52 days of operating for scientific investigation. This vessel also maintains an co-operative agreement with the Admiral Carlos Condell Foundation, directed to the training of students.

During this year the scientific vessel AGOR VIDAL GORMAZ has executed 4 cruises of scientific investigation with a total of 97 days of operation. These studies comprise the insular areas of Easter island and Salas and Gomez island, CIMAR - Fiord IV, CIMAR - Fiord III, and Drake Bransfield Strait.

Mr. Buse (Denmark) reported on the activities of R/V DANA. DANA has 14 cruises in 1998. 12 cruises are

carried out for DIFRES and two cruises are chartered by Danish government institutions.

Two charter cruises in the North Atlantic Sea for the research programme "Global Change" should have been carried out with DANA this year. The programme will charter DANA for two cruises in 1999. A different vessel will carry them out this year. The total numbers of cruise days will be 179.

Three cruises in the North Sea and in the Baltic Sea are fish stock assessment cruises, co-ordinated by ICES. Four cruises are parts of EU-supported research programmes. The other cruises are part of DIFRES own research programmes. DIFRES is not able to make use of DANA's full cruise capacity and is thus very interested in chartering it to others institutes, national and international.

As to the equipment a hull mounted ADCP has been installed.

A Web-project for information on vessels, cruise plans, cruise reports, oceanography database etc. Has been initiated. The beginning of this work can be seen on <http://www.dfu.min.dk>. There will be more to come during next year.

Mr. Goosen (South Africa) reported that the three research ships (AFRICANA, ALGOA and SARDINOPS) only operated along the South African coast line and the Antarctic supply ship, AGULHAS, undertook her routine cruises (relieve personnel, cargo and research) to islands in the Southern Atlantic.

No major changes to facilities were made to any of the ships, except the fitting of a Continuous Underway Fish Egg Sampler (CUFES) to the ALGOA. Currently an investigation is underway to look at the pro's and con's of changing the bottom trawl gear (trawl warps, net and doors) on AFRICANA.

South Africa are continuing to experience major problems with keeping it's research ships in a reliable seaworthy condition and to appoint permanent officers to get the ships to sea. Sea Fisheries, that can only offer fixed government salary packages, are unsuccessfully competing with the private sector that offers remuneration packages in tax-free dollars. The salary related constraints together with a bureaucratic work environment make it impossible to recruit and retain ships officers. Over the last 18 months, for example, 12 chief engineers served on our three ships and without continuity preventative maintenance is non-existent and it is believed that this is the main reason for the breakdowns on AFRICANA. We are preparing a final report on the future manning and managing options for our fleet and are convinced that this should resort outside the government framework.

Mr. Pollentier (Belgium) reported on the 1998 operations of R/V BELGICA operated by MUMM - Ministry of Science Policy. As in previous years the Belgica operates with one crew, and is kept at sea for about 200 days per year. Mainly the ship operated in the North Sea for national research programmes. In the North East Atlantic the main activity was in the framework of the EU sponsored OMEX programme.

The cruise schedule 1999 was distributed as a hand-out.

Mr. Diaz (Spain) presented the news about the R/V HESPERIDES. A major change in the national science management structure has been produced in march this year when the new Office for Science and Technology ("Oficina de Ciencia y Tecnología" -OCYT), a co-ordination office depending on the Prime Minister's Office, was created. This office will co-ordinate all the efforts and budgets for R&D, but also will be responsible for the national large scale facilities, one of them is the R/V HESPERIDES.

During the past season, October 97 to September 98, the R/V HESPERIDES allowed for the development of three multi-disciplinary cruises supporting MAST-III projects (2 MATER and 1 CANIGO) in the western Mediterranean and Atlantic Ocean, 2 cruises also developed in Antarctica as well as providing logistic support for the two Spanish and a Bulgarian bases in Livingstone and Deception Islands. Three other cruises, for different national programmes, developed in the Atlantic, one of them in collaboration with Uruguay. Cruise disciplines has been 1 in Marine Geology, 2 multibeam mapping and 5 in Marine Physics and Biology. 1999 activities are already planned and will follow the same approach supporting both European project and Antarctic activities.

Improvement in the scientific capabilities of the R/V HESPERIDES have been achieved through the start in operation of the undulating CTD "Nu-Shuttle" plus the installation of a high speed data communication link through Inmarsat up to 64.000 bps. The two permanent compressors for seismic operations has been replaced

for two new ones but increasing more than four times the air delivery capability.

The "Unidad de Gestion de Buques Oceanograficos" -UGBO- (research vessel department) has growth-up to more than 30 people this year (only 3 in administration) although the consolidation has not been achieved yet. Research fleet in Spain may start to growth-up in coming years. "Instituto Español de Oceanografía" (Fishery Research Organisation) has planned to build-up a new vessel. Also a multipurpose vessel, smaller than R/V *Hesperides*, may be scheduled to start construction by the end of 1999; European funding for the development may be used in this case.

Ms. Rietveld (Netherlands) reported on the 1998 operations of the multi purpose R/V *PELAGIA*. Five-year maintenance was performed beginning of 1998. Research cruises started in March and were mainly in the North Sea and North Atlantic, West of Madeira, West of Ireland, Bay of Biscay, Iberian Margin for the international EU funded programmes *PROVESH*, *MERLIM*, *OMEX*, and *ENAM*, and for the *WOCE*-related programmes *TRIPLE-B* and *PROCS*. The vessel was also involved in training cruises for university students. For chartering out she was commissioned for 11 weeks. These were for the main part performed in co-operation with the *NERC* institutes in Southampton (*SOC*) and Oban (*DML*). Chartering out activities caused cancelling of ship-time for scientists up to 3 weeks (postponed till 1999) and prohibited "Acte de presence" of R/V *PELAGIA* at the Expo '98 in Lisbon. *PELAGIA* cruised for a period of 10 month (41 weeks) in total. One week was dedicated to testing new instrumentation, an undulating platform "Scanfish" with CTD. At the end of the year a hull mounted ADCP will be installed.

For the Dutch-French co-operative programme *MEDINAUT* the French R/V *NADIR* with submersible *NAUTILE* will operate for 40 days in the Mediterranean starting November.

Captain Taguchi (USA - NOAA) gave a presentation regarding the NOAA fleet organisation and activities. He presented a briefing of the Department of Commerce, National Oceanic and Atmospheric Administration's research fleet which is managed and operated by the Office of NOAA Corps Operations. The fleet is composed of 15 ships meeting NOAA's fishery, oceanographic and hydrographic mission requirements. Each year, the NOAA Programs meet to develop an annual fleet allocation plan which sets the number of days at sea and periods for all research projects as well as dockside repair. Specific highlights include the NOAA Ship *RONALD BROWN*'s around-the-world cruise, the new Sustainable Seas Expedition program, and the potential for four new acoustically quiet fishery research ships.

Ms Dieter (USA - NSF) reported on the UNOLS fleet for 1998.

The upgrade of the US University National Oceanographic Laboratory System (UNOLS) fleet continues. The fleet is composed of 28 ships operated by 20 institutions. Overall the fleet is doing well, however, some of the ships are under utilised. In 1998 a large and an intermediate ship were scheduled for lay-up. Both were able to find charters resulting in half year schedules and partial lay-ups. UNOLS is anticipating laying up one large ship in 1999.

Although the fleet is experiencing a decrease in days, new ships continue to be brought on line. Shipyard bids are currently being sought for two small ships (30 m), one catamaran and one conventional hull. Construction is being funded by the operating institutions. The Office of Naval Research (ONR) is supporting the design for a large SWATH that will be operated by the University of Hawaii.

The US Coast Guard icebreaker *HEALY* is under construction and expected to be delivered in late 1999 and ready for science operations in 2001. A major mission for the vessel is the support of arctic research.

The reduced requirements for sea time in support of the US oceanography are primarily a result of level science funding, increased use of remote data collection and investigators in the large global programs such as *WOCE* and *JGOFS*, concentrating on processing data and completing their scientific analyses. However, there is an increase in requests for small ships in support of coastal programs and for the large ship *ATLANTIS* which supports the *DSV ALVIN*. The facility is over subscribed in 1998 and 1999. The combining of the *ALVIN* and the ROV's on the *ATLANTIS* has been very popular. The ROV's are also being maintained in a fly-away mode which has helped to moderate the *ALVIN/ATLANTIS* schedule. An upgrade of the *ALVIN* and ROV's are being considered.

An external review committee is reviewing the overall management, operations and capability of the academic research fleet as a whole. This is reported separately under heading 16.

Ms Millick (USA - ONR) reported on new developments of the US fleet.

AGOR 26: The Navy conducted a competition to select an operator for its newest oceanographic vessel, hull number AGOR 26. The University of Hawaii was selected. The new vessel will replace the R/V MOANA WAVE. The vessel will be a SWATH (Small Waterplane Area Twin Hull). The Navy is currently doing the concept design for the vessel. Some desired characteristics are: Speed: 15 knots, operational in Sea State: 5-6, Range: 10.000 nautical miles, science berths 30, oceanographic equipment.

Primary contractor is Lockheed Martin. Anticipated delivery in 2001.

Other vessels' operating days in 1998 and 1999 respectively:

MELVILLE: 216, 252; THOMPSON: 277, 272 ; KNORR: 265, 0 (planned for lay-up); REVELLE: 316, 277; EWING: 245, 324; MOANA WAVE: 169, 136; ATLANTIS: 273(156 dives), 339(211 dives); BROWN: 320, 298; ALVIN, JASON, ARGO, 120KHz: 156, 211.

New equipment developments:

SEANET: Extending the Internet to the sea. The idea of SeaNet originated from an initial effort to connect ships with an email service in 1990. The SeaNet vision was expanded to include buoys and other remote platforms as part of the network. The goal of the effort is to demonstrate a cost effective use of INMARSAT High-Speed Data for interconnectivity between ship and shore. Preliminary results have shown a significant savings over INMARSAT A technology to transfer data.

The SeaNet infrastructure includes building a land-based and shipboard SeaNet Communications Node (SCN) and a "virtual mid-level" network that connects ships and remote platforms to a gateway Network Operating Center (NOC). The NOC will provide a gateway to the Internet, billing, routing, and other value added services.

Multibeam: There are some processing and possible hardware/software problems with the SEABEAM multibeam systems in the new ships. Issues are in swath width and depth accuracy, among others.

Mr. Peck (Canada), who succeeded *Mr. Elliott*, who retired this year, as an ISOM member could not attend the meeting, but presented a written report that will be added as an annex to the minutes.

Ms. Lahdes (Finland) could not attend the meeting but reported in writing. The cruise schedule of R/V ARANDA included 14 cruises - 11 of them had international connections serving more than national interests. Activities included e.g. research on ice and atmosphere (BASIS), biological and chemical processes in the sea bottom (BASYS), biodiversity, turbulence and plankton dynamics (MITEC) and monitoring of the Baltic Sea (BMP). Several of the projects had EU-funding. Outside the purely scientific programme R/V ARANDA completed a cruise called "Europe on Oceans" which was the European contribution to the Year of the Oceans.

3.2. Ship Time Barter/Exchange

Dr. Fay (UK) reported on the Tripartite Agreement between NERC (UK), IFREMER (France) and BMBF (Germany), which has established an arrangement for the barter exchange of shiptime and major facilities between each country. In order to make it work in practice, the UK changed its programming year to accord with France, and Germany is doing likewise, namely January to December each year.

The Working Group on Shiptime Exchange of the Tripartite Accord meets once a year in July-September to establish practical exchanges for the next programming year.

During 1998, containerised compressors were loaned to IFREMER and RV POSEIDON recovered moorings for the UK. IFREMER recovered some UK moorings using L'ATALANTE. The UK hosted a successful cruise for Germany on the DARWIN late last year.

Within the UK a new forum has been established, the UK Research Vessel Operators' Forum. This is expected

to meet annually to co-ordinate activities of the 6-8 operators of research and survey ships in the UK. Much like ISOM, but on a smaller national scale, the issues of ISM, STCW95 and insurance were high on the agenda.

Mr. Nakano (Japan) told that in July 1998 JAMSTEC chartered a Russian R/V PROFESSOR KHROMOV from Vladivostok for research in Russian EEZ waters comprising CTD, water sampling and mooring deployment. A cruise summary was made available as a hand-out.

Mr. Castrec (France) reported on shiptime exchange of IFREMER with Netherlands, United-Kingdom, USA, and Spain.

- Netherlands : In November 98, R/V NADIR and submersible NAUTILE will provide 24 days in Mediterranean sea for NIOZ.

- United-Kingdom : NERC loaned Ifremer a container of major seismic equipment for 5 months (late 97/early 98). Ifremer recovered mooring for NERC in August 98 with R/V L'ATALANTE south of Azores. This recovery required one day on R/V L'ATALANTE.

- USA : In February 98 we have done the ODPNAUT cruise with NADIR and NAUTILE.

- Spain : At the end of 1997, we have realised 2 days of coring during the cruise CALMAR (Mediterranean sea) on the R/V L'ATALANTE.

Mr. Goosen (SA) reported that financial constraints forced South Africa to limit sea time on its ships for 1997 to only the absolutely essential cruises necessary for the setting of Total Allowable Catch's for her commercially exploited marine resources. Total sea time allocations for April 1998 to March 1999 were limited to: AFRICANA 130 days, ALGOA 99 days and SARDINOPS 190 days. AFRICANA, however, only did a 20 day cruise and are laid-up since December 1998 with a propulsion motors breakdown. Although requests were received from several national and international research and commercial institutions to charter the ships, all the requests had to be turned down as a result of our financial constraints (charter fees are not paid into the Sea Fisheries budget but must be paid into central Treasury). At the end of 1997 the AGULHAS did a Southern Oceans cruise as a joint venture with Sweden and at the end of 1998 a similar cruise with New Zealand will take place.

Ms Rietveld (Netherlands) reported on the agreement with IFREMER, where the use of R/V NADIR with NAUTILE for a 40 day cruise in the Mediterranean was partly in the form of a barter with the exchange of 24 days of R/V PELAGIA shiptime.

Ms Dieter (USA - NSF) referred to the already mentioned exchange with France in the framework of ODP, and reported the use of the UK Antarctica ship "JAMES CLARK ROSS".

3.3. Staff Exchanges

Dr. Fay (UK) mentioned that there were no staff exchanges, but that one of the RVS technical staff sailed on VALDIVIA to provide mooring deployment support as part of the PROVESS project in the North Sea.

Dr. Strohm (Germany) and *Mr Castrec (France)* reported on staff exchanges between France and Germany. Mr Soltwedel and Sablotny from Alfred Wegner Institute were on board R/V THALASSA during the cruise "VICTOR PREMIERE" (august 98) to see the ROV VICTOR with a view to prepare the cruise 99 with VICTOR on POLARSTERN.

Mr. Tomas Liebe from RF was on board THALASSA during a second cruise in beginning October with VICTOR for the same aim (VICTOR on POLARSTERN).

Mr. Zaitso of NME (Japan) reported that Mr. Ishiwata who is a chief officer of NME was on board the R/V ATLANTIS, which is the mother ship of ALVIN of Woods Hole Oceanographic Institution, from September 4th at San Diego to October 6th at Easter Island. He joined this cruise as the adviser for recovery work of a

Mooring Buoy System in the East Pacific Rise, because the R/V YOKOSUKA moored this system last year and he was the chief mate of YOKOSUKA at that time.

Although we haven't seen his report about this cruise yet, we believe this was good opportunity for him to learn not only the operation of the R/V ATLANTIS but also a foreign country's ship's life.

Mr. Goosen (SA) reported that the NORAD funded Nansen programme provided regular opportunities to scientists of the SADC to participate on research cruises in the waters of these countries. The Benguela Environmental, Fishing, Interaction and Training (BENEFIT) programme is providing ongoing opportunities for staff exchanges among the SADC countries.

Mr. Diaz (Spain) reported that Jordi Sorribas, head of the computer department in the UGBO visited the National Oceanographic Data Center (NODC) in the Netherlands. Cruise support has also been provided by UGBO to Spanish scientists on board the following foreign vessels: CHARLES DARWIN, THALASSA and PROFESSOR STOCKMAN.

3.4. Equipment lost

Dr. Fay (UK) reported that the incidence of equipment being lost has not been high during the year. The following major items have been lost:

SOAFD ARIES on DARWIN 112

NIOZ Boxcorer on DISCOVERY 230

IFREMER Chalut ... Perche Trawl on DISCOVERY 231

Mooring Rig on DISCOVERY 229.

Also lost was the Aberdeen University AUDOS benthic lander which on the very last day was recovered by dragging with a long wire on the seabed - so it did not join the "lost" statistics.

Mr. Nakano of JAMSTEC (Japan) reported 7 incidents as shown in the hand-out. Three were CTD losses and four referred to other equipment, mostly part of a mooring like an ADCP, a sea-bottom seismograph, and acoustic release and accelerometer. In some cases the transponder did not respond. Snapping of the main cramp was the cause of most losses during retrieval. Inspection of one of the 4 TRITON buoys revealed much corrosion and a missing shackle. Subsequently it was decided to retrieve all four for inspection and maintenance. Sea water corrosion of the antenna and galvanic corrosion of the electronic system were obvious. Further inspection is underway. The corrosion was beautifully shown on some very clear pictures that were distributed as a hand-out.

Mr. Castrec of Ifremer (France) reported the loss of a CTD and the loss of a small sonar, for the latter recovery was planned today.

Mr. Buse (Denmark) mentioned the loss of a Seabird/Seacat CTD and at the same time a Scanmar depth sensor. Both instruments were mounted to at trawl, which got stuck to at shipwreck at 80-meter depth. It was not possible to recover.

Mr. Goosen (South Africa) reported that in August 1997, during a Hake Biomass cruise, the trawl winches on Africana failed (mainly due to inexperienced crew and poor maintenance due to a lack of funding) and all the trawl gear (doors, net and 2 x 3200m warp) was lost in 200m of water. A successful attempt to recover this gear was made in November and all gear were retrieved.

Ms Rietveld (Netherlands) reported the retrieval of a 125 m mooring off the Spanish coast in the Bay of Biscay, which was brought ashore by a fisherman.

Ms Dieter (USA - NSF) reported the loss and recovery of an ADCP.

4. International Year of the Ocean

Mr. Van Bergen Henegouw (secretary ISOM) recalled the special page on the ISOM Web site dedicated to the ships of ISOM members visiting the Lisbon Expo-98 as a tribute to the International Year of the Ocean. He invited the attendees to report on their activities in the framework of the IYO.

Dr. Fay (UK) reported that RVS has been involved in two major projects, namely

a) the visit of RRS DISCOVERY to EXPO and

b) an EC-funded project to introduce new graduates of oceanography to life on a research ship at sea under the "Europe on Oceans" programme.

A highlight of the year was the presentation of RRS DISCOVERY at EXPO '98 for five days in August when 10,749 visitors attended the scientific displays on the ship. In addition a number of receptions were held for various UK/Portuguese causes/organisations. DISCOVERY was complemented by a shorter visit of RRS JAMES CLARK ROSS in September, en route to the Antarctic.

"Europe on Oceans" as a pan-European project in which students and journalists travelled on various European research ships for their experience. At the end of August all attended a "grand finale" meeting at which experiences were presented. It was an excellent opportunity for students of different nations but common interests to meet and exchange their experiences at sea.

Dr. Strohm (Germany) reported the trip of a group of students on board R/V POLARSTERN from Lisbon to Bremerhaven. The WALTHER HERWIG III visited the Expo '98.

Mr. Zaitso of NME (Japan) mentioned the Open House opportunities on JAMSTEC ships. R/V MIRAI in Honolulu, Sydney and Seward with over 4000 visitors. RV YOKOSUKA with the submersible SHINKAI 6500 in Lisbon at Expo '98 providing also an on board seminar, with over 8000 visitors, and R/V KAIREI with almost 1800 visitors.

Mr. Castrec (France) mentioned the Acte de présence of R/V THALASSA and L'EUROPE at Expo '98.

Mr. Aranda (Chile) reported that during the month of May Chile participated as a whole with Colombia, Ecuador, Perú in the regional cruise Group of Oceanographic Investigation in the South Pacific Permanent Commission. This investigation counted with the participation of the scientific ships CARLOS PORTER (belonging to the Instituto de Fomento Pesquero) and AGOR VIDAL GORMAZ (of the national Army).

Mr. Buse (Denmark) mentioned that Denmark did not contribute to Expo '98, but to the National Science Festival, with an Open House and exhibitions on R/V DANA for two days in Copenhagen.

Mr. Goosen (South Africa) told that South Africa was one of the approximately 120 nations that had recently participated in the LISBON EXPO 98 which ended on the 30 September 1998 in Portugal. The Sea Fisheries Research Institute was one of the many organisations in South Africa, dealing with the Ocean in one way or another, that had a part in the South African Pavilion. A representative of our Institute went for a few days to Lisbon last month and reports that South Africa compared favourably with most other developed nations with regard to the conceptualising and design of exhibition stands and in fact was one of the pavilions highly rated by the organisers of the Expo. The Expo itself was beautifully laid out and that all services worked well. However, one large fault he observed and confirmed by the South African Project Manager was that of the enormous long queues outside most pavilions due to the fact that inherent design faults of the many stands prevented free-flow movement of people. The representative, himself, could not visit a number of pavilions as the average waiting period was between 1 to 2 hours at peak periods. The average person pays about \$30 (R200.00) per person for the day which is a lot for most people and then having to spend most of the day standing in queues!

Mr. Pollentier (Belgium) told that over 7000 visitors came on board the R/V BELGICA that visited the Expo'98 for six days in June.

Mr. Diaz (Spain) mentioned R/V HESPERIDES visiting Lisbon.

Ms Rietveld (Netherlands) mentioned the visit of the navy vessel Hr.Ms. TYDEMAN visiting the Expo'98 during the national days end of May. R/V PELAGIA had to withdrawn as a visiting ship due to strongly conflicting interests with scientific cruises. The reserved berth at the deepwater jetty could happily be swapped with the Finnish R/V ARANDA, sailing from Helsinki to Lisbon for the EU funded IYO project "Europe on Oceans". The participation of R/V ARANDA was the contribution of Finland to IYO. R/V ARANDA had over 5100 visitors.

Other activities were a public oriented scientific project together with the ferry service to the island of Texel. A hull mounted ADCP with on line display on screen on board the ferry and on the NIOZ web site giving details on temperature, salinity, depth, and current velocity every half hour during the day in the tide swept Marsdiep strait between the mainland and the island.

A day-trip on the Wadden Sea for school children as a price for a poetry contest regarding the sea on the small Wadden Sea R/V NAVICULA, and last week Open House at the institute on National Science Day, with over 1200 visitors.

Dr. Heinrichs (USA - NSF) reported on a variety of activities ranging from high level government policy meetings to outreach to the public took place. This report highlights a few of the items.

National Oceans Conference, Monterey, California: US President and Vice President attended and announced new initiatives for ocean policy including increased support for environmental and research activities for the nation.

Lisbon Exposition: R/V RON BROWN, NOAA, and USS PATHFINDER, Naval Oceanographic Office, visited Expo and hosted receptions.

R/V ATLANTIS with submersible ALVIN, NSF, took Portuguese and US flags on dive to honour Vasco de Gama with exchange in Lisbon.

Student outreach: National Ocean Science Bowl. Sixteen regional meets involving about 200 teams or 1000 students were held to recognise and reward excellence among students interested in ocean sciences. Winners went to Expo.

National Ocean Partnership Program YOTO drifters. Interactive web-based program set up to allow students and science classes to "follow" series of ocean drifters in Atlantic and use for different school level projects (ongoing).

Public outreach: Fifty Years of Ocean Discovery - Organised by National Academy of Sciences and NSF.

Three day symposium and celebration will feature presentations on landmark discoveries in ocean sciences, institutions and individuals that made the achievements possible, and a glimpse into the future of the field. This is not a comprehensive list as many regional institutional, museum, aquarium and science association activities were held. Identifies examples of major activities.

5. Insurance/liability of Research Ships

5.1. Update US developments

Prof. Nixon, the Risk Manager and Legal Advisor for the US UNOLS fleet, gave a presentation on the development of the group insurance program now available for research vessels. Developed by Global Special Risks, a division of Willis-Corroon, the program specifically addresses the needs of research vessels at a very competitive price. A number of US vessels have entered their program, and other operators have been able to seek rate reductions based on the lower price GSR has made available. This so-called "GSR Effect" has resulted in a significant decline in premiums paid along with generally better coverage. The total insurance premium for the US UNOLS fleet was approximately \$1.6 million in 1991; it had fallen to just \$1 million in 1998, despite the fact that the fleet had grown in capacity and policy limits were higher. The cumulative savings since the effort at cost control began in 1991 is approximately \$1.9 million.

Prof. Nixon then introduced Mr. Jim Hughes of Global Special Risks who discussed the world insurance market and the response of the insurance industry to the Y2K problem.

Mr. Hughes (GSR) gave a clarification on the profound changes in the insurance market and the foreseen developments with respect to the Y2k issue. The premiums are the lowest ever, and for the insurance market they have reached an unacceptable low level. So the time is approaching that rates are going up to correct the situation. The soft market can be contributed mainly to the absence of major losses (so far), excess capacity, globalisation of insurance, change in buying patterns and development of new methods of risk transfer via the financial markets.

As to the Y2k/Millennium issue and the insurance market it can be stated that the P&I Clubs, with their character of being mutual organisations, have a positive attitude, provided good and prudent husbandry is evident. More businesslike the H&M market has several types of exclusion clauses, arguing that Y2k is a foreseeable event. Some suggestions to come to a good premium under acceptable conditions is to have a consultant, broker or expert involved. If the budget is restrictive, increasing the own risk and various deductibles might help. Where charterers require H&M insurance such can be for a special fixed period (short term policy) on a value agreed premium.

Dr. Fay (UK) told that RVS has taken a number of actions to ensure that the possibility of problems with the potential Year 2000 computer processor problem should be minimised:

- a) Establish a Project Team to identify and rectify potential problems;
- b) Keep the ships in port during the roll-over from 1999 to 2000;
- c) Set aside funding to replace equipment which cannot be "fixed".

The assessment is that most problems or pieces of equipment have been covered. Those items known not to conform with the Y2K roll-over will be scrapped or replaced.

In relation to several questions on the Y2k issue in respect of insurance and shipping *Ms Rietveld (Netherlands)* referred to several specific websites addressing the issue. She promised to distribute a summary of key issues with references to relevant web sites to ISOM members shortly.

5.2. EU developments

Ms. Rietveld (Netherlands) had pursued the issue in Europe and had put on trial that GSR could produce a more favourable rate for vessels operating outside the notorious US liability law system. In a fair competition with European insurers for H&M and equipment insurance renewal the European market offered the most favourable premium and conditions, resulting in a 45% saving on premium. The European market has offered to study the possibility of a group insurance for research vessels in Europe, provided sufficient participation. Still the European R/V insurance situation is such that most vessels are under a so-called self insurance regime. Notwithstanding the problems this causes when trying to charter out for commercial purposes. Not much has changed since last year as shown on the updated inventory that was distributed as a hand-out. Of the 41 European R/V's only 7 have H&M insurance, 6 have equipment insurance and 16 have P&I insurance. 25 vessels are under self - insurance policy. Nevertheless 33 are available for charter.

6. ISM Code update

Dr. Fay (UK) gave a presentation on the implementation of the ISM Code and Revised STCW 1995 within RVS. He introduced the RVS Scientific Safety Management System, a risk assessment system for sea-going activities. The presentation and subsequent discussion was seen as very useful to enhance discussions on a national level. Copies of the presented sheets were distributed as a hand out.

7. Clearance Issues

Ms Rietveld (Netherlands) presented the issue on diplomatic clearance from a European perspective. The overall goal to explore possibilities to come to more simple and flexible procedures. She gave an overview on what has come out so far of the activities of different international organisations. That the just issued IWCO

report " The OceanOur Future" could offer a starting point, seemed to be a false hope. Two subsequent initiatives from the European Union failed. The only recipe for success offers a start on bilateral or trilateral basis, combined with procurement of as much political will as possible on sufficient high level. The bilateral and may be trilateral co-operation on oceanography between Germany, The Netherlands and possibly United Kingdom supported on a Governmental level might offer such an opportunity. ISOM welcomed the initiative, but expressed its doubts on the outcome given the experiences from the past.

The presented sheets were distributed as a hand out.

8. Oceanic Database Update and SEMRIS proposal

Ms. Bouton (OCEANIC) distributed the status of OCEANIC Ship Schedule and Information as of 10.10.98. Not all schedules could be updated. She asked ISOM members to provide the information, or let her know where to find the renewed schedules if they are available in electronic format.

Mr. Van Bergen Henegouw (Netherlands - ISOM secretary) presented the SEMRIS project. A proposal on the Shared use of European Marine Research Instruments and Ships. The proposal aims to initiate and operate a co-operative network of managers and operators of marine research vessels and marine equipment in Europe to encourage the shared use of instruments and vessels on a national and international level. A 'virtual pool' will be developed on the Internet, and there will be exchange of experience and development of common practices regarding handling equipment, calibration, deployment procedures etc. Close co-operation with OCEANIC is foreseen. The proposal is submitted to the EMaPS (European Marine and Polar Sciences Board) of the ESF and discussed at the Lisbon Conference end of May. The review time was very short and EMaPS needed more time to comment on and review the proposal. When supported by ESF the proposal will be submitted to the EU Fifth Framework for financial support. ISOM will await the developments with interest.

9. Fifth Framework Programme of the European Union

Mr. Ollier (EU-CEC, Brussels) gave a presentation on the Fifth Framework Programme of the EU and the foreseen support for research infrastructure. As a part of the infrastructure a budget of 70 million ECU is planned for marine research facilities. These comprise databases, sampling methods, taxonomy support, test basins, research vessels, platforms, manned and unmanned observing systems. The aim is to encourage the transnational use of public or private facilities through transnational co-ordination, networking and increase of compatibility.

The call for proposals is foreseen starting March 1999. A 50 percent matching is needed. Partners from outside the EU are welcome.

With this new possibility to obtain funds for infrastructure from the EU it also is evident that the right procedures should be followed, and 'pushing the right buttons' is needed to be successful. Mr. Ollier offered his assistance. The sheets presented were copied and distributed as a hand-out.

10. International Marine Technicians Workshop 1998 Update

The chairman introduced *Dr. Woody Sutherland*, who is member of the Steering Committee that organises the 1998 INMARTECH Workshop. Dr. Sutherland presented the programme for the INMARTECH 98, that will be held on 20-22 October at SIO La Jolla. There will be parallel sessions with workshops on geophysical technologies, ROV and towed vehicles, bottom sampling techniques, ADCP and CTD packages, deck operations and onboard safety and shipboard networking and SeaNet. Demonstrations on underway sampling system and multibeam processing will be held on R/V MELVILLE. There are 154 participants from 12 countries. As in 1996 an evaluation will be held at the end of the workshop based on a questionnaire to be filled in by all participants.

11. Chartering-out of Research Vessels

Ms Rietveld (Netherlands) gave a presentation in which she discussed her experiences with chartering-out R/V PELAGIA. Chartering out has become a necessity because of the tight financial situation of the institute. Preferably chartering out takes place without interfering with the own scientific cruise schedule, or fitting in smoothly because of research aim and/or cruise area. This mainly is the case when chartering out to scientific organisations either for their own research (in a more or less co-operative setting) or for more commercially oriented research. In the first case the own regime as to planning procedures and standard C/P can be imposed with mutual agreement. In the second case the planning procedure may suffer intrusion. Pitfalls can be encountered in case the chartering out is for commercial organisation(s) for commercial research. These relate to uncertainty in planning, with last minute rescheduling and extension options, tough contract negotiations with excessive requirements as to insurance, liabilities and indemnities, y2k compatibility, confidentiality, safety and health regulations and offshore survey practices. To resolve these pitfalls it is wise to make absolutely clear from the beginning that you are a scientific organisation where other rules prevail than in the commercial world. Always set a fixed date for redelivery of the ship, always set a penalty clause for late payment, avoid subcontractorship and subsequent rider clauses, stick to your standard C/P as much as possible and keep continuous feed-back with your insurance broker, P&I insurer and/or legal advisor on insurance and liabilities. Evaluate the use of a simple Data Exchange Agreement. If the scientific work to perform does not deviate from your usual practice: stick to your prevailing rules and safety regulations and scientific survey practices. Never sign a contract that contains issues you cannot live-up to or that you do not understand completely.

Prof. Nixon (USA - UNOLS) presented some recent cases encountered when chartering-out UNOLS vessels. One concerns the R/V MAURICE EWING, where in the charter negotiations the Lamont University the US Government and the oil company were involved. The charter agreement became enormously complex, as well as the insurance requirements. All in all, it was a three ring circus, with lawyers for the oil company, Lamont, and NSF-UNOLS struggling with the final terms. All agreed on one thing: the simple idea to keep an unused ship busy was much more complicated than anyone had anticipated. Another case concerns the R/V SEWARD JOHNSON chartered out to Discovery Channel, where the ship became involved in the search for a disappeared helicopter, with a subsequent fight over the question who should pay for the extra ship days.

12. Research Vessel Lay-up Procedures

Ms Dieter (USA - NSF) introduced the issue. With the present overcapacity about 2-2.5 "ships" needed to be laid-up. Under the "UNOLS-Charter" two-third of the crew is permanent and one-third on a 1-year rolling term contract. The problem "How to keep the crew busy" is partly solved with chartering-out, where NSF would be satisfied with a 70% performance. She would like to learn how others dealt with the problem.

Dr. Strohm (Germany) told that most crew was on a contractual basis, and not linked to a specific ship, but rotating over the vessels. Lay-up was mainly only in winter. The number of crew was not maximised, some were hired additionally on time-contract. To a certain extent holidays were to be taken "in advance".

Mr. Van Bergen Henegouw (Netherlands) told that with the former R/V TYRO, that was only used for approx. 100-150 days per year, the lay-up was done as a bare ship, under the supervision of a shipping company. This means mostly only one watchman on board. The scientific winches/cables and other gear remained under maintenance on shore by the technical support staff.

Mr. Zaitso of NME (Japan) mentioned a similar case of lay-up with just one watch officer.

Mr. Williams (Naval consultant) reminded that there are specific lay-up procedures for ships, but that the problem can be the scientific systems.

Mr. Goosen (South Africa) added that lay-up can have disastrous effects when lay-up is done for a long

period.

Mr. Castrec (France) admitted that for the ships it takes about a week to get all things going, but this is not a real problem. The problem is the computerised instrumentation, because of the too high humidity during lay-up.

13. Derbyshire Project UK/US

Mr. Williams (Naval consultant - UK) presented the Derbyshire Project.

In September 1980 the 200.000 tons UK bulk carrier Derbyshire vanished without a trace during a typhoon SW of Japan. In 1995 she was found by sonar. The subsequent investigation was aimed at reconstructing what could have caused the loss and how the typhoon contributed to that loss. For the specific requirements of the investigation the specific expertise of the Deep Submergence Facility of Woods Hole was the only that could do such a job. The UK ministry of Transport and Environment signed a MOU with NSF. The work was performed by the UNOLS Deep Submergence Science Community (DSSC) represented by Mr. Bowen. In a mesmerising slide presentation with subsequent video animation *Mr Williams* and *Mr. Bowen* showed the unravelling of drama:

By ALVIN DSL 120 - an unmanned system for wide area high resolution search and bathymetric mapping.

By ARGO - large area visual search augmented by sonar.

By JASON - a light work ROV with robot arm, for close inspection and close view, with various mapping functions and equipped with special imaging devices, and high definition video camera.

All systems work on fibre-optic cable that also handles data management. All are portable, containerised in standard 20 foot ISO containers.

The search was performed in 1997 and revealed with detailed images of over 2000 pieces of wreckage, and tracks of cargo disposition, the most likely series, combination and sequence of events.

14. Submersible/ROV and AUV usage/status

Ms. Millick (USA - ONR) gave a presentation on the Navy use of submersibles & ROV's:

In September 1997 the Navy decommissioned the DSV TURTLE. In September of 1998, the Navy decommissioned DSV SEACLIFF. Both assets were offered to the academic community. SEACLIFF, the deeper-diving of the two was transferred to WHOI. The US agencies are funding an engineering study to determine integration of systems and subsystems between ALVIN and SEACLIFF. There is strong support for ROV capability to 6000m.

The DSV's were decommissioned because the Navy has higher priority requirements that must be funded.

Focus of Navy is on submarine escape and rescue with a reduced manned search and salvage capability. The Navy can execute this with Submarine Rescue Chambers, DSRV's - Deep Submergence Rescue Vehicles-, and Atmospheric Dive Suits. They will rely on currently acquired systems, manned/ROV's.

NSF discusses the interest in ROV's - based on Derbyshire project and scientific needs evolving from this US/UK ROV project.

The Autonomous Underwater Vehicles (AUV) program has been developed primarily through ONR's Ocean Modelling and Prediction group. There is a budget commitment of 37.4 million USD. The goal of the program is to develop accurate representations of the ocean system as it evolves in time and space. The program focuses on enhanced predictability through better dynamical formulations, improved numerical methods and optimal data assimilation through adaptive sampling. In summary, better, on-time, accurate data for the naval fleet.

Development and application of sensing systems and unmanned underwater vehicles for land margin continental shelf oceanographic and environmental measurements for mine countermeasures and other applications. This capability is to be achieved through the deployment and real-time control of a distributed mobile network of sensors onboard small AUV's operating in the littoral ocean.

The overall goal of this capability is to significantly improve the mapping of geophysical fields by reducing temporal and spatial aliasing and the forecast skill of ocean variability by feedback adaptive sampling.

Essential components of this AUV-based sampling system are

- * cost-effective platforms capable of autonomous energy re-supply,
 - * low power and weight oceanographic sensors,
 - * precise underwater navigation,
 - * reliable subsurface acoustic communication and over-the-horizon radio link for control and data telemetry, and
 - * network management software for adaptive reconfiguration to achieve mission objectives most efficiently.
- The liability consequences of the use of these AUV's is not yet studied.

Mr. Chijiya of JAMSTEC (Japan) informed the meeting on the just started 4.8 billion Yen (approx. 40 million USD) project by JAMSTEC on AUV's with a 300 km range and at 3500 m depth, to be ready in 2003. The power source will be a Polymer Electrolyte Fuel Cell (PEFC). and a lithium Ion battery. After this first phase a longer range AUV will be constructed up to 2000 km and 6000 m depth. Detailed specifications could be found in the distributed hand-out.

15. US/NSF Academic Fleet Review

Dr. Heinrichs (USA-NSF) gave a presentation on the on going review of the Academic Research Fleet. The review concerns the total UNOLS fleet of 28 R/V's. The aim is the most cost effective operating and managing of ships, whereas the questions have been posed whether the present capacity meets the requirements, and whether the advisory, funding and management structures are adequate. The review should start from the requirements of the research sponsored by NSF in a national framework, also including ONR, and private companies assessing the demand for ship time with a projection to the future. Whereas the USA strives for maintaining world leadership in ocean and environmental scientific research.

The recommendations should include actions for improvement of organisation, management and cost-effective operations. In the present time schedule the committee will have its last meeting in December 1998, and is expected to present its report in February next year. The report will be made public. Copies of the presented sheets were distributed as a hand-out.

16. Other Business.

JAMSTEC highlights of 1998

Mr. Chijiya of JAMSTEC (Japan) presented the plans for the building of a new drilling ship, for which the designing will start next year. In five years - May 2003 - the ship will be completed. The ship will be 190 m long, 32 m wide, GRT 31.000. There will be accommodation for 150. Construction costs are estimated at 57 billion Yen (over 500 million USD). In December this year the decision will be taken, that will be final in March 1999. Mr. Chijiya expressed his optimism towards the outcome of the decisions including the budget.

Mr. Chijiya presented another highlight, which is the started sea trials this September of the offshore wave-powered device "MIGHTY WHALE". While absorbing the energy from ocean waves and dissipate the wave height behind the device, thus protecting against typhoon damage, and generating a relatively calm coastal zone sea area, MIGHTY WHALE at the same time supplies electric energy.

UNOLS Safety Video

Mr. Althouse (USA - SIO) announced that the video will be shown as an entremet during the Bar-B-Que lunch at the Marine Facility in San Diego and the visit to view Scripps' ships MELVILLE, REVELLE and the FLIP.

17. Date and Place of Next Meeting

All ISOM members present were in favour of continuation of ISOM.

Mr. Chijiya of JAMSTEC (Japan) announced that JAMSTEC together with NME and GODI will have the pleasure of hosting ISOM in 1999 at the home port of the new R/V MIRAI in Mutsu City on the Shimokita peninsula in Northern Japan. The dates will be 12 - 14 October 1999. All members acclaimed to this proposition.

Ms. Rietveld (Netherlands) reconfirmed last year's announcement that the Netherlands would be happy to host ISOM in 2000. The Netherlands would be happy also to host the third INMARTECH Workshop in 2000.