18th ERVO MEETING

The 18th ERVO (European Research Vessels Operators) Annual Meeting was organized by the Hellenic Centre for Marine Research (HCMR), City of Rhodes (Rhodes/Greece) from Tuesday the 10th to Thursday the 12th of May 2016.

For more details, see at http://www.ervo-group.eu/np4/np4/39.html

Tuesday 10th May 2016

14.00 – 17:00 – Regional focus meeting "Eastern Mediterranean and Black Sea"

This was the first time that a half-day meeting occurred before the annual ERVO meeting concerning the region where the meeting takes place. The objective is to foster more regional cooperation among ERVO members to present issues and opportunities.

Agenda

- Round table
- Institutes/organizations and fleets presentations
- Fleet schedules 2016-2017 presentations. Past and forthcoming activities in the area (Scientific cruises, Surveys, Observatories)
- Issues encountered in this area (DipClear, Migrants)
- Cooperation requested/proposed (Shiptime, equipment time, technicians, training, exchanges, Barter, Charter)

Giuseppe Magnifico has given to the group a wide presentation of the CNR facilities, e.g. RV's and equipment, seashore and at sea stations and ongoing programs. He explained that moreless 50% of the budget came from the Italian Government and the rest mainly from EU (programs projects…).

Afterward Aris Karageorgis has given an interesting and complete presentation of the HCMR marine infrastructures, current programs and fleet activity.

Olivier Quédec has presented the IFREMER naval facilities, e.g. research vessels and submarine and seismic equipment. During the last 30 years the IFREMER fleet has carried out more than 1500 cruises. The fleet consists of four ocean and regional vessels (RV POURQUOI PAS?, RV L'ATALANTE, RV THALASSA, RV LE SUROIT) and three coastal vessels. In addition, IFREMER is operating several submarine systems, e.g. the submersible Nautile, AUVs and ROVs.

Erica Koning has informed the group about the Dutch activities with RV PELAGIA in the Mediterranean and Black Seas. Since 1986 long term moorings were installed in the anoxic basins (Bannock and Tyro Basins) by Prof. Gert de Lange from the Utrecht University. This mooring is now continued as part of the DUST program. In addition, several EU programs such as EROS, ERSEM, MATER, Pass, MEDIFLUX, and many more with NIOZ and Dutch university scientists and international partners were part of the activities in these areas.

Ian Sage has presented the activities of the Centre for Maritime Research and Experimentation (CMRE) which is a world-class scientific research and experimentation facility that organizes and conducts scientific research and technology development (see summary of his talk on Tuesday 10th of May at 12 p.m.).

This was followed by an open and useful discussion on the operational aspects concerning the cruises undertaken in that area (schedules, clearence issues, ect) but also on other topics like finance, vessels maintenance, manning….

For more details, see the presentation at http://www.ervo-group.eu/np4/np4/39.html

17.00 – 17:30 - Tuesday 10th May 2016

ERVO ExCom meeting

19.30 - Tuesday 10th May 2016

Icebreaker cocktail on the floating Restraurant "Kon-Tiki" where a finger buffet and refreshments were available.

Wednesday 11th May 2016

08.30 – ERVO General Assembly

At the beginning Olivier Quédec has presented the agenda of the General Assembly:

- ERVO new website
- ERVO Terms of References
- ERVO/EUROCEAN agreement
- ERVO treasure
- ERVO Strategic Document

After the presentation of the ERVO new website by Sandra Sá all members have the possibility to give their vote.
The ERVO Terms of References is still in progress and should be finished soon by Olivier Quédec.
Olivier has visited EUROCEAN in December 2015 in Lisboa to have a discussion with Sandra about the agreement. Both had taken the view that no modifications are necessary. However, a treasure is needed in managing the ERVO funds.
An important aspect for ERVO is their strategic document for the next five years. The "ERVO way ahead" document, which was presented by Giuseppe Magnifico during the 17th ERVO meeting, serves as a basis for the new strategic document. A draft of this document is being prepared by Olivier Quédec who will then send it to the members for comments/remarks…

In the following Giuseppe Magnifico presented us his work on a content analysis of the ERVO meetings minutes from 2005 to 2014. The general purpose was to highlight the discussion topics of the past ten years.

The outcome allows us to highlight:

- continuity (or not) in time of the issue addressed
  [if an issue was up for discussion every year]
- the intensity
  [how much the issue was addressed every year]
- the topic internationalization
  [if the speakers of each topic are from the same country (or not)]

He used three levels of analysis: Level 1 = Macro, Level 2 = Meso and Level 3 = Micro. The following table indicates some examples:

Level 1 - Macro	**Level 2 - Meso**	**Level 3 - Micro**
Delegates reports of activity	National update/New member	CNR RVs activities
RV builts, modific. perform	Design. green & silent RVs	Reduce pollution
Manning, safety and training	Med. & sea survival training	Safety procedures

Scientific technology	Scientific requirements	Problems in building a RV
Legal and insurances	Diplomatic Clearance	Law of the sea
Cooperation and outreach	OFEG & OFEG Tech	Future perspective
ERVO Group	ERVO fututre	ERVO/EUROFLEETS rel.-ship

7 Macro categories 70 Meso categories 706 Micro categories

It is important to note that this method has benefits (e.g. easy overview of topics, many possibilities of analysis) and cons (e.g. subjectivity of coding, accuracy of the minutes).

The first results indicate that the categories "Delegates reports of activity" and "Cooperation and outreach" have the highest intensities with 28,3% and 26,6%, respectively, whereas the categories "manning, safety and training" and "Legal and insurencs" have the lowest intensities with 4,8% and 4,0%, respectively.

For more details, see the presentation at http://www.ervo-group.eu/np4/np4/39.html

09.00 – Opening of the 18th ERVO meeting – Olivier Quédec (Ifremer, France)

The 18th ERVO meeting was officially openend by the chair, Olivier Quédec, and subsequently he presented the agenda of the 18th ERVO meeting.

See the agenda at http://www.ervo-group.eu/np4/9/

09.10 – Welcome address and introduction to the HCMR activities – Aris Karageorgis (HCMR, Greece)

The ERVO group was warmly welcomed to the Hellenic Centre for Marine Research on Rhodes (HCMR) by Dr. Andreas Sioulas and Aris Karageorgis. In the following Aris Karageorgis gave an introduction to the HCMR profile and activities.
The HCMR is a large public state research centre that belongs to the Ministry of Education, Research and Religious Affairs, under the General Secretariat for Research and Technology. It is the main responsible for the Oceanographic, Fisheries and Internal Waters research in Greece, constituted of three relevant Institutes with 90 researchers out of an overall 500 staff. Almost 60% of the research staff is working for the Institute of Oceanography, which can support research on the fields of Physical, Chemical, Biological Oceanography, Marine Geology and Geophysics and Operational Oceanography.
The HCMR comprises of four facilities at different places with the HCMR Headquarters in Anavyssos (Attica), the Institute of Marine Biology, Biotechnology and Agricultute of Crete, the Institute of Marine Resources & Inland Waters of Athen and the Hydrobiological Station of Rhodes. The fleet consists of the three research vessels AEGAEO (1985), PHILIA (1986) and ALCYON (2009).

The HCMR has an interesting history. In 1934, during the Italian occupation of the Dodecanese (1912-1943), following a decision of the Italian governor Mario Lago, the building of the "Reale Istituto di Ricerche Biologiche di Rodi" commenced, in the far north cape of the island. The construction was completed by 1935. In 1937 the building began to operate, studying the hydrobiology, the sponges, fisheries of the Aegean sea and hosting an

aquarium with interesting species of the marine fauna of the Mediterranean. Designed by Armando Bernabiti, the building combines local architectural elements with Art Déco elements of curved lines and circular windows, along with a dominant cylindrical tower. The decoration of the main entrance draws inspiration from the marine environment. The Aquarium consists of a corridor, with small tanks, that host marine species on both sides, made of stone and decorated by natural shells, featuring an underwater cave, while the floor is paved by white and black pebbles, featuring marine species. Since the integration of the Dodecanese to Greece, in 1948, the Hydrobiological Station of Rhodes, belonging to Hellenic Centre for Marine Research, is a very important Research Institute on physics, chemistry, biology and geology of the seas and the inner waters, at national and international level. The Hydrobiological Station also operates as a research museum, hosting the aquarium and an exhibition area added in 1971-1972, on the north side of the building.

09.40 – Presentation of participants

Round table: each ERVO participant briefly introduced herself or himself.

09.50 - Introduction ERVO meeting – Olivier Quédec (Ifremer, France)

Olivier Quédec thanked Aris Karageorgis for the icebreaker and all 31 participants of the meeting for coming. He especially mentioned the representative from Turkey which has participated for the first time on an ERVO meeting.

Olivier Quédec has started his presentation with a short introduction to ERVO's birth and it's achievement in the past.

10.30 – Coffee break and national update posters

The following posters were presented during the meeting:

- German Research Vessels – Tina Knuth, Klas Lackschewitz
- RV BELGICA Activity 2015 – Lieven Naudts
- R/V OGS EXPLORA – refitting an old lady – Instituto Nazionale di Oceanografia e Geofisica Sperimentale - OGS
- Italian Update 2016 – CNR "Office for planning", Central Management for Planning and Infrastructure
- Cefas Endeavour, UK – David Limpenny
- Research Vessels operated by CSIC – 2015 Cruise Activity
- Ifremer 2015 fleet activity
- IMR fleet 2015 activity

For more information, please see the posters at http://www.ervo-group.eu/np4/39.html

10.50 – Approval of 2015 ERVO minutes

ERVO minutes 2015: No comments were made and the minutes were approved.

10.50: New ERVO website – Sandra Sá (EuroOcean, Portugal)

Sandra has presented the new ERVO website which was created by her during the last months. The development of the website has started already in 2012 and the final organization was perfomed during the last ExCom meeting in Barcelona 2015. The webpage consists of the four categories

- About ERVO
- Members
- Meetings
- Relevant Links

"About ERVO" is divided into four topics Background, ERVO Governance, Formal Documents and the History of ERVO.
The category "Members" includes ERVO members, ERVO Regular Guests and ERVO Partners. The category "Meeting" includes all locations since the first ERVO meeting in Roscoff/France in 1999. For most of the meetings you can download the agenda, the attendance list, the minutes and the group photo. Since 2007 there are also meeting documents available.
Under "relevant links" you can find links to vessel positioning and cruise programmes as well as to infrastructure infobases.

For more details, see the presentation at http://www.ervo-group.eu/np4/np4/39.html

Theme 1: Delegates Reports of Activity

11.10: EurOcean/ERVO cooperation – Sandra Sá (EurOcean, Portugal)

Sandra Sà presented a summary of the formal agreement between ERVO and EurOcean which regulates the activities of cooperation since the 1st of January 2014.

The duties of EurOcean are:

- Acquisition and renewal of a new domain for the "Public Website"
- Hosting of ERVO website in EurOcean server
- Maintenance and content update
- ERVO's member list of contact update and assurance of the flux of information among members

The duties of ERVO are:

- Each ERVO member country shall pay to EurOcean an annual fee of € 300 for hosting, maintenance and acquisition and renewals of a domain of the website
- Each year the ERVO chairman shall provide EurOcean with the list of all ERVO members to be invoiced

In 2015 EurOcean has performed the hosting and maintenance of ERVO website on the EurOcean server. The website was updated upon request of the ERVO chairman, mainly with informations of the 17th ERVO meeting. In addition, it was carried out an upgrade of the website and it was ensured regular information between the ERVO members.

For more details, see the presentation at http://www.ervo-group.eu/np4/np4/39.html

11.30: TUBITAK Marmara Research Center – activities and facilities – Haldrun Karan (TÜBITAK, Turkey)

As new ERVO member, Haldrun Karan presented at first a video about the activities and facilities of the TÜBITAK Marmara Research Center. TÜBITAK (The Scientific and Technological Research Council of Turkey) is the most important institution for the organization of research and evolution in Turkey. It contains five strategic business units as "Air Quality Management", "Water & Wastewater Mangemant", "Marine & Inland Water Management", "Cleaner Production" and "Solid & Hazard Waste Management". The study area ranges from coastal and gulf ecosystem studies until evaluation of environmental impacts due to activities in seawaters. These studies are mainly supported by government-funded and EU-projects.
One of the most important infrastructure to support the marine research is the R/V TÜBITAK MARMARA. The vessel was launched on the 1st of July 2015. The R/V TÜBITAK MARMARA is a regional research vessel serving oceanographic, hydrological and bathymetric research. It operates in the Turkish seas. The 41 meter long vessel has three laboratories in which a water, biological and sediment samples can be investigated. The research vessel has capacity for 12 scientists + 12 crew members. It has a dynamic postioning system (DP1), a hull mounted single- and multibeam echosounder and a hull mounted ADCP current profiler. The communication takes place via satellite.
Another new infrastructure supporting the marine research is a 1000m rated observation class ROV. Lab tests are already completed and sea trials are planned for September 2016.

For more details, see the presentation at http://www.ervo-group.eu/np4/np4/39.html

12.00: NATO / CMRE – Ian Sage (CMRE, Italy)

As new ERVO member, Ian Sage presented the Centre for Maritime Research and Experimentation (CMRE). It is an established, world-class scientific research and experimentation facility that organizes and conducts scientific research and technology development, centred on the maritime domain, delivering innovative and field tested Science & Technology (S&T) solutions to address defence and security needs of the Alliance. CMRE is NATO's knowledge repository for maritime S&T, offering a trusted platform for 28 NATO Nations and partners to work together and to share science and technology. CMRE conducts relevant, state-of-the-art scientific research in ocean science, modelling and simulation, acoustics and other disciplines, that is potentially game changing. CMRE also provides Science & Technology enhancements to unmanned vehicles and vessels, integrated defence systems, and autonomous intelligent systems that better enable operators to complete missions in hostile environments by avoiding, defeating and surviving attacks. CMRE also offers the opportunity for collaboration in maritime and joint programmes to support acquisition,

enhance interoperability and generally, prepare better for the future. Through the delivery of sea-proven maritime innovation and interoperability solutions, CMRE aspires to be an indispensable source of maritime science and technology in order to support the Alliance' core tasks. The CMRE programme of work is concentrated in five areas aligned to maritime security challenges:

- Cooperative Antisubmarine Warfare Programme
- Autonomous Naval Mine Countermeasures Programme
- Ocean Engineering
- Environmental Knowledge Operational Effectiveness Programme
- Maritime Situational Awareness Programme

CMRE operates two research vessels that enable science and technology solutions to be explored and developed at sea. The largest of these vessels, the NATO Research Vessel ALLIANCE, is an ice-capable global class vessel that is one of the world's quietest vessels, allowing for precision acoustic studies to be conducted at sea. Since the beginning of 2016 the ALLIANCE is now operated by an Italian military crew under an Italian Navy Flag. RV LEONARD is a smaller vessel mainly working in coastal waters. It is characterised by full dynamic positioning and low noise configuration.

For more details, see the presentation at http://www.ervo-group.eu/np4/np4/39.html

12.30 – Lunch at HCMR

13.20 – RV Belgica: damage, repairs and refit – Leeven Naudts (Belgium)

The RV BELGICA is a 51 metre long sailing laboratory used by the researchers of the Belgian universities and scientific institutes to increase our knowledge of the seas. The Federal Science Policy Office is the owner of RV BELGICA. The ship is placed at the disposal of Belgian scientists in order to carry out marine scientific research. The OD Nature of Royal Belgian Institute of Natural Sciences (RBINS) takes responsibility for the ship's budget, the scientific instrumentation and the planning of scientific campaigns. The Belgian Navy provides the crew, operational support and a mooring in the home port of Zeebrugge.
In 2016 the Belgian oceanographic research ship turned 32. During this time RV BELGICA has performed 175 scientific days on average per year. However, the obsolescence of the vessel is now a major problem. The onboard systems are old, not trustworthy and even dangerous. Many parts are no longer available or the provider just doesn't exist anymore. Obsolescence maintenance is not a major refit and it is designed to keep the RV Belgica in a safe and good working order for a maximum period of 4 years, but in 2015 flooding of the engine room caused a hole in the ship's hull has damaged the main engine, generators, pumps and electrical cabling. Therefore, the vessel must be taken out of service for 5 month for the repair. The final cost was 1.5 M€ incl. VAT. CASCO insurers paid in advance 900k€ and still investigating the VAT obligation of RV BELGICA. But after 30 years a new research ship - RV BELGICA II – is needed. Finally, the RV BELGICA will get an obsolescence maintance in 2016 to have a relaible and safe ship for the coming 3-4 years. Contemporaneous, it is expected to get a final agreement on the build of a new ship. It is planned to start tendering in 2016 and to award the construction of the vessel in 2017. The delivery of the new vessel can than be expected for 2019 or 2020.

For more details, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

13.50 – A.D, 2015 – Andrea Grazzini (So.Pro.Mar. SpA, Italy)

SO.PRO.MAR. S.p.A was founded by Michele Tramontano in 1981 together with a group of specialists and technicians with a great experience in oceanographic research, naval equipping and ship handling. From the first years of activity the Company was devoted to the armament of scientific and technological research vessels for public and private companies. Ever since, SO.PRO.MAR. has established a long and proficuous partnership with National Research Council – Consiglio Nazionale Delle Ricerche – CNR.
SO.PRO.MAR owns and/or operates some research vessels for Italian research institutes: URANIA, MINERVA UNO, ASTREA, VEGA UNO and VETTORIA.

RV URANIA entered service in 1993, being the first Italian research vessel planned and built specifically for scientific and technological research. Ever since, RV URANIA has been used by C.N.R. while SO.PRO.MAR. has taken care of the technical and handling aspects. The most visible intervention planned was the lenghtening of the vessel with the inserction of a new 6 meters section.
On August 25th 2015, the research vessel URANIA heeled portside at the floating dry dock in Livorno, Italy. The props crashed and ship fell with list of 30 degrees, causing fell or slid of all unsecured equipment inside. The URANIA was also damaged seriously from the accident. The port side hull has large breach from heeling. The local authorities started investigation of the accident, as according to preliminary information block or blocks gave under, which caused damage of the props and heeling of the ship.
Considering that the engine room is still underwater after almost 8 months, it is likely that electrical devices and engines are irremediably damaged, just like the DP and multibeam electronics. All of the scientific equipment transducers were located on a below the keel blister and, even in this case, it's very likely that they have been severely damaged.
When the URANIA accident occurred, RV MINERVA UNO had already entered back in service after the end of the interventions.
C.N.R. and SOPROMAR managed to change the expected schedule so that MINERVA UNO took the place of URANIA. In this way there has been no pause in C.N.R. scientific activities, even if some cruises had to be postponed to better times.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

Theme 2: RV builds Modifications and Performance

14.10 – R/V Thalassa - mid-life refit - Olivier Quédec (Ifremer, France)

The Ifremer's oceanographic and fisheries Research Vessel, THALASSA (74 m length) has been built in 1995 and is now in her mid-life. The purpose of this mid-life refurbishment is to provide a reliable and efficient multipurpose platform appropriate to the coming 20 years of marine science. It includes the replacement of the obsolete scientific equipment by up-to-date scientific equipment. This modernization shall not modify the current capabilities of the vessel (especially fisheries research capabilities) but it is planned to add a marine geoscience function. An expected scope of supply by the shipyard is the integration of acoustic

equipment in a gondola which will be designed and built for fitting of new equipment such multi-beam echo sounders (EM 302 and 2040), a new multi-beam fishery echo sounder, a sub bottom profiler, an ultra short base line system and an acoustic Doppler current profilers. The delivery completes the already excisting single beam fishery echo sounders. In addition, a new deck knuckle crane will be delivered as part of the mid-life refit. Beside the replacement of the four diesel generators a new propulsion electrical motor drive will be fitted. The refit includes also the modernisation of some specific rooms (labs, cafeteria, scientific rooms), the power management system, the alarm and monitoring system and the fire station. These works should be realized in a drydock during summer 2017 (June to mid September including the trials at sea).

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

14.30 – R/V Celtic Voyager engine failure 2015 – Aodhán FitzGerald (Fleet manager, MI, Ireland)

The Marine Institute of Ireland is operating the two national research vessels RV CELTIC EXPLORER and RV CELTIC VOYAGER. The RV CELTIC VOYAGER is the smaller of the two research vessels at 31.4m in length and can accommodate 6-8 scientists. Maximum number of consecutive days at sea is 14. The CELTIC VOYAGER is suitable for coastal research and offshore survey operations and is used for a variety of applications including fisheries research, environmental monitoring, seabed mapping, oceanographic work, buoy maintenance and student training.
In 2015 the vessel suffered a failure of its fuel pump and main engine shut down. The investigation revealed a broken fuel pump drive shaft. Therefore, the fuel pump was replaced and a new drive shaft installed. In addition, all engine controll and fuel systems were investigated. Subsequently, the electronic system was reconnected and the engine was restarted. Unfortunately, the engine runs into immediate overspeed and suffers a catastrophic failure with the lubricating oil dip stick being blown from sump, the crankcase breather line failing, and rocker covers being blown off. One cylinder head was heavily damaged. One of the valve spring collet holders had broken and this had allowed the valve to fall into the cylinder. Aluminium debris was found in the inlet and exhaust trunking for the other cylinders of the engine and that the turbo charger was damaged by the passage of debris.
Both vessels had extremely busy schedules so needed to get vessel back in service as soon as possible, three possible options were available as Wartsila no longer produce the original SACM Wartsilla engine. The Marine Institute decided to use a “Baudouin” 12M26.2 marine diesel which was a direct swap for the existing Wartsila 12UD25 in terms of engine mount and gearbox / PTO coupling dimensions could be made available 3 weeks from order (12 month warranty). The engine replacement and refit was carried out in drydock in approximately 6 weeks. In total it tooks 72 days from failure to the new engine. The vessel is now faster, quieter and slightly more efficient with lower emissions. This incident has shown that you can’t rely the engine manufacturers to support old and out of production models. One should have a replacement plan drafted in advance to speed up decision making process which need to acquire spare parts for out of production engines. Finally, it is helpful to have framework arrangements with vessels in their region to provide cover in the event of a major problem.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

15.00 – Operation of R/V Celtic Voyager and ideas of replacement designs – Aodhán FitzGerald (CEO MI, Ireland)

The RV CELTIC VOYAGER is a multipurpose research vessel suited to coastal research and offshore survey operations. The vessel is used for a variety of applications including fisheries research, environmental monitoring, seabed mapping, oceanographic, meteorological and radiological surveys, weather buoy maintenance, and student training since 1997. The vessel is equipped with full hydrographic/oceanographic instrumentation suite including EM 3002B/EM2040 multibeam systems. In addition, it has a permanent hull mounted USBL system. A mid life refit was completed in 2006. One of the major limitations of the vessel is the sea keeping-weather downtime in the Irish offshore areas. The RV CELTIC VOYAGER is more suited to operations in sheltered seas such as the Irish Sea. It can operate and complete most operations here in all except the worst winter weather.
There are three options to continue with the Irish marine science activity:
Option 1: Continue with the current vessel. Fleet becomes more limited as RV CELTIC EXPLORER demand increases with new fisheries programs, RV CELTIC VOYAGER becomes less fit for purpose over time , Capacity to complete marine Science research diminishes.
Option 2: Refit and extend the existing vessel. Expensive option, vessels small size and design make this option not feasible. Many limitations remain and sea keeping, may in fact dis-improve.
Option 3: Build replacement vessel of c. 46-50m with similar draft as VOYAGER vessel available to complete existing role, but far more suited to working offshore on existing new projects and acting as a viable back up to the EXPLORER.

Several already existing research vessels as the RAMON MARGALEV (IEO Spain) or SIMON STEVIN (VLIZ, Belgium) were considered for the new potential design. However, there are many key issues (e.g. funding, ICES 209, manning level, operating cost) which must be solved.

For more information, please see the presentation at
http://www.ervogroup.eu/np4/np4/39.html

15.05 – Modification of the R/V Dr. Fridtjof Nansen – Johnny Ytreland (IMR, Norway)

The Norwegian government has decided to modify the existing R/V DR. FRIDJOF NANSEN for future cruises in the Arctic Ocean. After the modifications the vessel will be named „KRISTINE BONNVIE“ replacing the R/V HAKON MOSBY. The vessel will be outfitted with a new tunnel thruster, a new A-frame, several new winches with towing wires and coax wires to cover a wide range of marine resaerch in the Arctic region. The preparations for the work in the Arctic includes the inspection and insulation of the entire vessel. In addition, the hydraulic oil must be changed and all tank ventilations must be protected for sailing in the polar environment.
An inclining experiment in 2011 has shown a limited stability for the vessel. For the operations in the Arctic new stability calculations must be carried out because icing on deck

add stability requirements. It is planned to reduce the deadweight as much as possible. Therefore, everything that is not needed will be removed including serveral layers of old piant on the hull. In addition, all spare parts which are not critical for daily operation will be stored in a warehouse in Bergen.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

15.15 – Refit of R/V Johan Hjort – Johnny Ytreland (IMR, Norway)

The research vessel JOHAN HJORT is 65m long and was built in 1990 in Norway. She is equipped for fisheries and environmental research and will mainly operate in the Norwegian Exclusive Economic Zone. During the next refit of JOHAN HJORT the main engine and gear will be changed. It is planned to install a new hybrid system with a new auxillary engine including selective catalytic reduction (SCR) and a battery package. Beside the replacement of the engine a new integrated automation and power management system will be fitted.

The general advantage of the battery hybrid system is that it will be charged by the vesselsdiesel engine. During offshore operations the battery can take the peak load which lead among others to an operation on less numbers of engines and an optimizing of the load on the running engines. It gives also the vessel a full flexibility in port to use shore power, battery only or use the auxillary engine with SCR in combination with battery.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

15.30 - Coffee break & national update posters

See the list of posters on page 4 of these minutes.

16.00 - Aquarium tour

16.25 – Greening ships & ports – Andre Cattrijsse (VLIZ, Belgium)

In 2012, a University-National Oceanographic Laboratory System (UNOLS)-sponsored workshop was held to develop sustainability guidelines for oceanographic research vessels. The meeting included presentations from marine architects, designers, builders, related private businesses and representatives of the federal government and foreign research vessel operators. UNOLS continues to promote the recommendations of the Greening the Research Fleet Workshop to help make the present and future fleet more environmentally sustainable. It was followed by other workshops in 2014 and 2016. Gregory Marshall, a Naval Architect from Victoria, B.C. Canada, considers that green boats are a social challenge not a technical challenge. The greenest vessels in the world are totally sustainable, e.g. unsinkable, made entirely of organic material and painted with biodegradable organic paints (https://www.unols.org/sites/default/files/GBIII_April2016_ap08.pdf).

Other examples are:

https://www.unols.org/sites/default/files/GBIII_April2016_ap17.pdf

https://www.unols.org/sites/default/files/GBIII_April2016_ap22.pdf

https://www.unols.org/sites/default/files/GBIII_April2016_ap23.pdf

For more information, please see the presentation at at http://www.ervo-group.eu/np4/np4/39.html

Theme 3: Manning, Safety and Training

16.35 – RV Zeeleeuw – Andre Cattrijsse (VLIZ, Belgium)

In 2012 the Kenya Marine and Fisheries Research Institute (KMFRI) and the Flanders Marine Institute (VLIZ) signed a formal Memorandum of Understanding for bilateral collaboration in the field of marine science. This agreement has the aim to promote partnership in collaborative research projects and in capacity building for research, technology development (incl. research vessels), data management, and education. It should increase profile and visibility of marine science collaboration in both countries and internationally.
In 2013 the oceanographic research vessel of the Flemish Government RV ZEELEEUW was donated to Kenya. Within the frame of the MoU, VLIZ has coordinated and facilitated the translocation of the vessel, cooperated in all scientific operations such as providing and placing scientific instruments on board of the ship, training IT staff, scientific assistants, students, etc. The RV MTAFITI has left the harbor of Ostend and sailed to Mombasa via the Suez Canal mid 2013. The first training of the KMFRI took place in January 2014 and the first cruise was made in December 2015.
In April 2016 VLIZ and KMFRI had a workshop onboard RV MTAFITI in Mombasa, Kenya. The ambition was to jumpstart the deployment of RV MTAFITI and thereby the advancement of marine science in the WIO region. The workshop has included classroom training as well as a hands-on experience on-board RV MTAFITI covering all aspects on how to operate and plan a scientific cruise, demonstrations of the use and maintenance of marine sampling equipment, oceanographic (biological, chemical and physical data) sampling applied to the local demands, data collection and data management.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

Theme 4: Scientific technology

16.45 – NIOZ – New deep sea cable test – Erica Koning (NIOZ, Netherland)

Since 2010 RV PELAGIA is equipped with a special deep sea winch with a non-metallic aramid cable for work down to 9600 m which was manufacrured by the French company Cousins Trestec SA. It was used for a wide number of applications, such as piston coring, box coring, multi coring, ultra clean CTD-sampling, video surveys, video guided sampling, video

guided deployment of landers and towed vehicles. At the beginning the breaking strength of the cable was at 20 tons but after one year the breaking strength has deceased to 10 tons.
The cable of this NIOZ work horse is now due for replacement to get more power to the seafloor. Therefore, we looked at Dynema, Vectran and Aramid but it remained difficult due to the fact that PELAGIA is using a double traction winch. At the end there were two options: return to Cousins or a new manufacturer. However, the cable from Cousins is twice as expensive. For that reason we used a 300m-long test piece on a 35m high cran. We put a 3600 kg weight on the cable to haul up and lower the weight 1000 times. After 220 cycles the reinforcement of the cable becomes completely detached over a certain length. NIOZ is now waiting for the report from the manufacturers. This has shown us that we will test again in any event.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

17.00 – Ifremer new H-ROV Ariane - Olivier Quédec (Ifremer, France)

Olivier Quédec has presented the new hybrid underwater robotic system H-ROV ARIANE designed by Ifremer. The H-ROV ARIANE is designed to provide an innovative tool ready to be operated in tethered (ROV) or autonomous (AUV) modes offering new possibilities for subsea application up to 2,500m water depth. Thanks to its very compact design, based on internal power supply, its deployment does not require neither heavy umbilical nor DP vessel during operations and insure a real time monitoring. This innovative technology combines the ability to gather high resolution data, performing vertical inspection and intervention tasks while reducing operational expenditures, through the implementation of a ROV and AUV systems in the same architecture. Tethered mode can be used for close inspection and intervention tasks where the operator controls directly the vehicle on real time thanks to a patented actuator system. The H-ROV can be operated in autonomous mode either as a safety fallback strategy in case of tether rupture, or as a dedicated mission such as performing a safe structural inspection of subsea processing system thanks to its complete hovering navigation. The H-ROV offers wide possibility for scientific community to explore and insure intervention tasks in different seabed morphology, emphasis on canyons, cliffs and steep inclines providing 2D and 3D mosaic, close-up inspection, light tools manipulating, optical imaging and acoustic mapping. This system is able to gather specific sample thanks to a motorized tools bay, a water and faunal specimen sampler combining with an electrical reversible water ballast system. Additionally, the full electrical manipulators guarantee a cost effective solution for reducing maintenance costs and enhancing reliability compare to traditional hydraulic system.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

17.15 – Next INMAR-TECH meeting – Johnny Ytreland (IMR, Norway)

The Institute of Marine Research (IMR) has been selected to host the 10th International Marine Technician Symposium - INMARTECH 2016, which will be in Grieghallen in Bergen, Norway, on 4-6 October 2016. The objective of INMARTECH is to provide a forum

for international exchange of knowledge and experiences between marine technicians on research vessels.

The main topics of this symposium are:

- Hydroacoustics
- Autonomous and tethered vehicles
- Seismics and coring
- Data management
- Ship – shore communication
- Underwater radiated noise
- In-situ observation systems

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

17.00 – End of day 1

19.30 – Dinner at "Romeo Retaurant"

Thursday 12th May 2016

08.15 - Opening - Practical arrangements day 2 – Olivier Quedec (Ifremer, France) & A. Karageorgis (HCMR, Greece)

08.30 – IRSO update – Aodhán FitzGerald (CEO MI, Ireland)

The 28th IRSO meeting, kindly hosted by Scripps Institute of Oceanography, was held from Tuesday 20 to Friday 23 October 2015 in La Jolla, California, USA. The meeting was attended by 61 delegates from 17 countries.
The 29th IRSO meeting will be held from October 10th-14th 2016 in Anacapri, Island of Capri, Italy.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

Theme 5: Legal and Insurance

08:40 – New polar code: last news – Miguel A. Ojeda (UTM-CSIC, Spain)

The International Polar Code for ships operating in polar waters was adopted in November 2014 by the IMO Maritime Safety Committee. It applies to ships operating in Arctic and Antarctic waters. The Polar Code adds additional requirements to those already applicable to ships under relevant IMO treaties, in order to address the specific challenges ships face when trading in the harsh conditions of the two poles. The complete Polar Code, encompassing the safety-related and environment-related requirements, is expected to enter into force on 1 January 2017. It will apply to new vessels constructed after that date. Ships constructed before will be required to meet the revelant requirements of the Polar Code by the first intermediate or renewal survey, whichever occurs first, after 1st of January 2018.
The Polar Code covers the full range of design, construction, equipment, operational, training, search and rescue and environmental protection matters relevant to ships operating in the inhospitable waters surrounding the two poles.
The Code will require ships intending to operate in the defined waters of the Antarctic and Arctic to apply for a Polar Ship Certificate, which would classify the vessel as Category A, B or C ship.
Ships will need to carry a Polar Water Operational Manual, to provide the Owner, Operator, Master and crew with sufficient information regarding the ship's operational capabilities and limitations in order to support their decision-making process.
The chapters in the Code each set out goals and functional requirements, to include those covering ship structure; stability and subdivision; watertight and weathertight integrity; machinery installations; operational safety; fire safety/protection; life-saving appliances and arrangements; safety of navigation; communications; voyage planning; manning and training; prevention of oil pollution; prevention of pollution form from noxious liquid substances from ships; prevention of pollution by sewage from ships; and prevention of pollution by discharge of garbage from ships.
Sharing within ERVO members experiences will be interesting, especially in all aspects related to the preparation of the “Polar Ship Certificate” and the “Polar Water Operation Manual”.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

Theme 6: Cooperation and Outreach

09.10 – EUROFLEETS 2 – Preparation of the project’s legacy – Valerie Mazauric (Ifremer, France)

EUROFLEETS 2 is an EU funded project started in March 2013 for a duration of 48 months with funding of 9 M€ and 31 partners from 20 European and associated nations working together in three structuring activities: i) TransNational Access, based on the evaluation process successfully proven in EUROFLEETS and providing access to 22 Research Vessels (RVs) and 5 pieces of equipment on basis of scientific excellence, ii) Joint Research Activity, focused on innovative technologies for underwater systems, generic designs for Regional RVs, and software tools with strong emphasis on standardisation, and iii) Networking Activity with a range of actions aiming to better coordinate European Research fleets (including the polar vessels), and a particular emphasis for the training of young scientists.

In the continuity of the successful results achieved in the first EUROFLEETS project, the 5 ship-time and equipment-time calls organized in EUROFLEETS2 have generated an impressive partnership (50 proposals were submitted, involving multi-national groups from more than 180 institutions from 39 countries), what confirms the relevance of TransNational Access to strengthen scientific exchange at European and international level and to run research programmes which are difficult or not possible to conduct at a national level. In total, the budget available for this activity allows to fund 24 scientific projects representing more than 200 days at sea to carry out ship based research activities within a wide range of scientific disciplines.

Knowing that EUROFLEETS2 is expected to end by February 2017, the preparation of the project's legacy is a priority for the coming months and will aim to determine which components should be transferred to other existing groups. Many of the topics and reports of interest are linked to the networking activity and Valérie Mazauric presented a list of those which could be of interest for ERVO, such as the follow-up of the evolution of European Research fleets and Equipment, the reports dealing with procedures for RV management in Europe, the recommendations and protocols proposed for more interoperability between European Research fleets (including the individual interoperability assessments of Large EXchangeable Instruments (LEXI) across (39) European Global & Ocean RVs) etc.. Studies carried out on RV design also include several guidelines on ship greening, noise and vibration reduction, bubble sweep down avoidance and work deck installations for Regional RVs.

In accordance with the ERVO strategic paper under preparation, it is consequently wished that ERVO determines in the coming months which EUROFLEETS components or reports the group would be willing to take over, maintain or to further expand.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

09.40 – EuroGOOS, EOOS and links to Global initiatives (by SKYPE) – Patrick Gooringe (SMHI, Sweden)

EuroGOOS is an international association of 39 national agencies (+ 60 ROOS members), institutes and research organizations in 19 European countries promoting and implementing Operational Oceanography. Founded in 1994, EuroGOOS operates in the framework of the Global Ocean Observing System (GOOS) of UNESCO/IOC. EuroGOOS objectives are:

- Strategy: identify priorities for operational oceanography
- Promotion: of operational oceanography and the necessary research and technology
- Cooperation: at global and regional scales (GOOS, ROOS)
- Coproduction: of data and model based services
- Coordination: of European contribution to sustained observing systems
- Representation: of members to third parties (EU, Int. organizations etc.)

EuroGOOS is a platform for:

- International cooperation for sustained observations of the oceans
- Generation of oceanographic products and services
- Interaction between research, operational, and user communities

The Regional Operational Oceanographic Systems (ROOS) coordinate and support development and joint service production in European regions. The objectives, activities, and governance of the ROOS are agreed in MoUs signed between regional EuroGOOS members and non-members. EuroGOOS insures pan-European representation and interface for ROOS. Furthermore, EuroGOOS faciliates cooperation among the ROOS sharing borders or strategic interests.
EuroGOOS Working Groups and networks of marine observing platforms (Task Teams) deliver strategies, priorities and standards towards an integrated European Ocean Observing System (EOOS).

EOOS is a coordinating framework designed to align and integrate Europe's ocean observing capacity. It promotes a systematic and collaborative approach to collecte information on the state and variability of our seas and underpins sustainable management of the marine environment and its resources. EOOS will provide a light and flexible coordinating framework to help manage and improve the existing observing effort, making it more efficient and effective at different geographical scales, and for different end-users. Access to marine data is possible via the European Marine Observation and Data Network (EMODnet). EMODnet consists of more than 100 organisations assembling marine data, products and metadata to make these fragmented resources more available to public and private users relying on quality-assured, standardised and harmonised marine data which are interoperable and free of restrictions on use. EMODnet is currently in its second development phase with the target to be fully deployed by 2020.

It is decided that an ERVO representative will attend the next EOOS meeting in order to present ERVO to this group.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

10.15 - Coffee break

See the list of posters on page 4 of these minutes.

10.35 – ENVRIplus: interview/built a document collecting the needs from all Environment Research Infrastructures (5 to 10 years ahead) - Juanjo Danobeitia (UTM-CSIC, Spain) together with J.F. Rollin

ENVRIplus is a Horizon 2020 project bringing together Environmental and Earth System Research Infrastructure, projects and network with technical specialist partners to create a more coherent, interdisciplinary and interoperable cluster of Environmental Research Infrastructure across Europe.
Environmental Research Infrastructure provides key tools and instruments for the researchers to address specific challenges within their own scientific fields. However, to tackle the grand challenges facing human society (for example climate change, extreme events, loss of biodiversity, etc.), scientific collaboration across the traditional fields is necessary. The Earth system is highly interlinked and the area of focus for environmental research is therefore our whole planet. Collaboration within the ENVRIplus will enable the multidisciplinary Earth system science across the traditional scientific fields, which is so

important in order to address today's global challenges. The cooperation will avoid the fragmentation and duplication of efforts, making the Research Infrastructure' products and solutions easier to use with each other, improving their innovation potential and cost/benefit ratio of the Research Infrastructure operations.
The European Multidisciplinary Seafloor and water-column Observatory (EMSO) is a large scale, distributed, marine Research Infrastructure. EMSO consists of ocean observation systems for long-term, high-resolution, (near) real-time monitoring of enviromental processes including natural hazards, climate change, and marine ecosystems. EMSO observatory nodes have been deployed at key sites around Europe, from the Arctic to the Atlantic, through the Mediterranean, to the Black Sea. EMSO is one of the environmental Research Infrastructure on the Roadmap of the European Strategy Forum on Research Infrastructures (ESFRI). The ESRFI Roadmap identifies Research Infrastructure of pan-European importance that correspond to the long term needs of European research communities. The Svalbard integrated Arctic Earth Observation System (SIOS) is one of the 44 proposals included since 2008 in the roadmap of ESFRI. SIOS aims to establish an (Arctic) Earth System Observing Facility on and around Svalbard that covers meteorological, geophysical, hydrological, cryospheric and biological processes from a set of platforms matching Earth System models (ESM). A fundamental element of SIOS will be to provide access to the Earth System Science research facilities in Svalbard to scientists from all over Europe and beyond.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

11.10 – European Cooperation for Polar Research. Actions in iniatives within Horizon 2020 - Juanjo Danobeitia (UTM-CSIC, Spain)

Polar matters have been rising up the political agenda across Europe over the past decade since rapid changes in the Polar Regions affect significantely the global climate. European polar research has contributed critical knowledge to identify the processes influencing global changes with consequences for global society. Datasets from the Polar Regions are still insufficient to fully understand and more effectively predict the effects of change on our climate, ocean circulation, drastic biodiversity changes and society. Recent EU actions as **Eurofleets** and/or **EU-PolarNet** go on this direction.
This situation can be improved by making an effort to improve the lack of fully equipped PRV, manly for multiyear ice, to tackle the scientific requirements from **IASC** and **SCAR**
The ARICE initiative in the framework of H-2020 is an Arctic Research Icebreaker Consortium which pretends to set up a strategy for meeting the needs for marine based research in the Arctic to strengthen collaboration between European through **European Polar Board**, and with USA, Canada, Japan, Korea and other nations. It is recommended to find ways to promote transnational access to Polar Research Vessels (**ARICE**).
From Europe **Eurofleets** and **Eu_PolarNet**, we promote workshops with international partners to collect information on National Polar Programs to encourage increased collaboration and planning efforts in polar marine research.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

11.35 – OFEG update – Olivier Quédec (Ifremer, France)

OFEG represents Europe's leading oceanographic research organisations and provides a forum to consider barter exchange and co-operation opportunities for the Global and Ocean Class research fleet. OFEG members are Ifremer (France), BMBF (Germany), NIOZ (Netherlands), IMR-UoB (Norway), CSIC (Spain), NERC (UK). The recent activities include bartering ships and large portable equipment and developing common standards and safety training. It is planned to run an Environmental Impact Assessment (EIA) workshop. NERC and NIOZ have developed a marine facilities planning program (http://www.marinefacilitiesplanning.com). This program is a modular system to facilitate an integrated cruise planning process including track and trace equipment, customs reports, customs warehouse, project management module, cruise planning module, scientist portal and crew/technician planning tool. The aim for the near future is to have an OFEG page showing the current status of all member vessels.

For more information, please see the presentation at http://www.ervo-group.eu/np4/np4/39.html

11.45 – Date & Place ERVO 2017 - Skype with Juha Flinkman – Olivier Quédec (Ifremer, France)

Olivier Quédec had contacted already our Finnish colleague Juha Flinkman before the meeting and jointly agreed on a Skype connection during the ERVO meeting 2016. During the Skype connection Juha Flinkman has actually invited us to come to Helsinki for the next ERVO meeting in 2017.

11.55 - Closing of ERVO 2016 – Olivier Quédec (Ifremer, France)

Olivier Quédec thanked all meeting participants for the good job done during this meeting and the team of the Hellenic Centre for Marine Research on Rhodes for the excellent organization.

12.00 - Lunch

12.30 - Departure
