Procedure on rapid response capabilities
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1. Introduction

Efforts towards an improved efficiency and fluidity in the management of European research fleets cover a lot of aspects among the capability to provide a rapid response to emergencies of some significance at sea. This is the subject of the task 4.3 implying RBINS-MUMM, IOPAS, MI, CNR, HCMR and EurOcean, in close cooperation with ERVO and for which the second deliverable due, is D.4.5 "Procedure on rapid response capabilities" (M36).

2. Description of task 4.3 from DoW

Task 4.3 – Vessel Operation Rapid Capabilities (M1-M48): This task (to be performed in close cooperation with the ERVO group) will cover the following aspects:

1) The general information on operational standard plans of each vessel (in which region, to which boundary) and their technical capabilities will be compiled and synthesized and kept up-to-date;

2) The "real time" online geographic positions of the research vessels (from AIS, SAILWX, SATC systems…) will be made electronically accessible. These positions will be documented with Meta information on the actual work program of the vessel and updated at a daily basis at least. The website of EurOcean (which currently acts as a European centre for information on marine science and technology) will be used as a focal point for displaying such information;

3) Contacts will be established with authorities, RV managers and services expert in case of incidents at sea. Procedures will be defined in order to place these information and offers technical and scientific support at their disposal, for a possible integration in their intervention plans;

4) Exercises will be organized with research vessels simulating real conditions events. From the lessons learnt by these exercises, the feasibility of such an adaptive management of the research fleets and the added value brought by this flexible approach will be analyzed following various criteria: distance between the vessel and the event, significance of the event, advantages/disadvantages to react or not to react;

5) Detailed cost/benefit analyses of such vessel rerouting will be carried out and a system of possible compensation/reimbursement (including intervention from insurances, in case of maritime accidents) will be examined.

3. Procedure on rapid response capabilities

1. Introduction

This is a step by step procedure to initiate a rapid response of a research vessel to recover a lost scientific instrument at sea. This procedure can be adopted for use of the rapid response capabilities of research vessels for any kind of maritime incident.

2. Description of the incident, the lost instrument and the proposed intervention

To allow a correct transfer of information between the involved parties a complete description needs to be foreseen by the Point of Contact (POC) of the lost instrument. This description can help the POC of the research vessel, in coordination with the master of the research vessel, to decide of the specific research vessel is appropriate to search and recover the lost instrument.

A. General Description of the incident/loss of the instrument:
Describe:…

Description		Input		Remarks
B.	**Instrument**			
a.	Type	Type of instrument: … Manufacturer: … Model: …		Buoy, lander, ROV, etc.
b.	Size	Height: … Length: … Beam: …	m m m	
c.	Weight	Net weight in air: … Net weight in water: … Max weight in air: … Max weight in water: …	ton ton ton ton	 e.g. including samples
d.	State	original/damaged Describe: …		
e.	Hazards	Liquids/explosion/implosion/other Describe: …		

C.	**Location**		
a.	Coordinates & Time	_ _ _° _ _._ _ _' N/S ; _ _ _° _ _._ _ _' W/E at _ _ h _ _ ; _ _ / _ _ /20_ _	Uncertainty of position?
b.	Depth	… m	
c.	Method	Describe: …	Acoustic transponder; Iridium?
D.	**Description of the proposed intervention** (crane, dredging, etc.) **and relocalization** (transponder; multibeam; side-scan sonar; etc.): Describe:…		
Please provide the necessary documents, pictures, etc. indicating the technical specifications of the lost instrument and clearly indicate the pickup/fixation points of the instrument on a photo.			

3. Localization of research vessel (cfr. ANNEX 1)

I. Go to the following website: http://www.sailwx.info/shiptrack/researchships.phtml
II. Zoom in to the location of the lost instrument by right-clicking on the shown map
III. The ships in the selected area are listed below by “at sea” or “in port/not reporting”
IV. Select the vessel “at sea” closest to the last location of the lost instrument
V. the update time of the research vessel position is indicated in the list below; if the update time is older than one day, select another vessel

4. Contacting the POC of the research vessel (cfr. ANNEX 2)

I. Go to the following website: http://www.eurofleets.eu/rvs/
II. Give in the of the research vessel in the query [Vessel Name] and click on the “search” button; the research vessel will be listed below
III. Right-click on the vessel’s name and you will be forwarded to the vessel’s information page
IV. On the vessel’s information page the name and contact information of the person who acts as POC is indicated
V. On the vessel’s information page also a link is provided to the vessel’s website often with indication of the cruise plan which can provide additional information about the vessels current/future positions and activities
VI. Contact the POC of the vessel and provide the “Description of incident, instrument and proposed intervention”

If no research vessel can be found by reiteration of the above points 3 and 4, a bulk mail, including this document, can be send to the EUROFLEETS2 beneficiaries: eurofleets2@listes.eurofleets.eu

5. Evaluation of task 4.3 including deliverables *"Vessel Operation Rapid Capabilities"* and *"Procedure on rapid response capabilities".*

Hereby a review of the different aspects of task 4.3, as were described in the DOW.

I. *Overview of research vessels (working area and technical capabilities)*

An up-to-date overview of research vessels is available on the following Eurofleets website: http://www.eurofleets.eu/rvs/. EurOcean makes regular updates of the used database which contains most of the information needed with regard to the rapid response capabilities of research vessels, e.g. the technical information about the vessels, the general working area, the contact person information, etc.

To even better support the rapid response procedure, it is advisable that an extra item, with a link to the planned schedule of the research vessel, is added to the contact information section on this website. For the moment, a link to a general website of the institute or of the research vessel operator is mentioned. Adding a direct link to the vessel's schedule, would help the person initiating a rapid response to get more information about the current and near-future scientific programming including the current and near-future working area of a particular ship.

II. *Real-time position of the research vessels*

At this moment there is still not a fully up-to-date website where the correct real-time position of research vessels can be found. The sailwx website is for sure the best website at the moment with a specific section related to research vessels (http://www.sailwx.info/shiptrack/researchships.phtml). Besides, the global and zoomable maps, the near real-time positions of all recognized research vessels (i.e. indentified via AIS or via Voluntary Observing Ship (VOS)), are listed with an indication of the update time. The latter helps to assess how up-to-date the given position is. The website even gives an overview of the technical and contact information of the listed research vessel. However this information doesn't always seem to be up-to-date. Besides this, some research vessels don't send out a weather report or are not recognized as a research vessel by the website (e.g. RV Simon Stevin), thus the sailwx website doesn't provide a complete overview of the possible available research vessels.

Eurofleets also set up a website where the past, current and near-future cruise programs and working areas of Eurofleets research vessels can be found, cfr. WP 2 task 2.3 (EVIOR) and WP 10 task 10.7 (http://eurofleets.maris2.nl/v_eurofleets_v1/browse_step.asp). With regard to the rapid response capabilities the information which can be found on this website is far from complete since not all cruise programs are uploaded. Besides this he indicated working area is sometimes too general (e.g. the complete Mediterranean Sea).

It is advisable that Eurofleets(2) in cooperation with EurOcean sets up a website where the online real-time positions of research vessels can be found, at least for the research vessels which are available in the research vessel database (http://www.eurofleets.eu/rvs/). The real-time positions could be added to the latter website. As done by sailwx, the real-time positions could be retrieved via AIS and VOS. In this way an integrated website for research vessel information and location could be created.

In the meanwhile Eurofleets (2) and EurOcean could use for example www.marinetraffic.com where a "my fleet" account could be created wherein all research vessels currently present in the EurOcean RV database can be added. In this way, the AIS position of these research vessels would be combined and could be easily consulted.

III. Informing authorities and research vessel operators

Based on this deliverable each Eurofleets partner can contact their national authorities to inform them of the rapid response capabilities, within a specific area, of research vessels and the associated procedure as is created within the Eurofleets project. In this way, the possible availability of research vessels in case of incidents at sea can be included in the national and regional intervention plans of coast guards, health services, etc. In some countries research vessels are already included in the national intervention plans, e.g. RV Belgica for the Belgian part of the North Sea.

IV. Rapid response exercise

During the ERVO meeting in Oristano, Sardinia, in May 2011, the rapid response of research vessels was discussed among the European research vessel operators. The main conclusion was that a rapid response action of a research vessel is an ad hoc approach to retrieve lost scientific equipment. Experiences from the past have shown that a rapid response activity of a research vessel can be very time consuming, expensive and even frustrating. In many cases the loss of scientific equipment is related to, let's call it, not so smart deployment or anchoring of devices; i.e. the loss of the equipment could be avoided and thus also the subsequent rapid response intervention. Based on the experience within the ERVO group it is clear that the initiation of a rapid response intervention should be thought over very carefully and should be an exceptional event. The value of the lost instrument should be in relation to the value of the ship time, man power, risk taken at recovery, etc. related to the requested rapid response intervention.

V. Cost/benefit analyses

As was already indicated in the previous section, a rapid response intervention can be a very expensive action which should be in relation to the value of the lost scientific equipment. The value of a lost instrument includes the price of the instrument and the scientific value of the scientific data that was gathered and stored or that will be gathered in the future. In many cases, a marine institute will not have the financial means to immediately replace the lost instrument. In this way not only future data gathering is jeopardized but even commitments to near-future projects. The POC of the lost instrument should assess the value of the lost instrument before initiating a rapid response intervention.

There are several options to handle the financial consequences of a rapid response intervention:

1. At charter cost
    - If a ship is available and the instrument owner can pay the charter cost, this option is probably the most flexible and result-oriented.
    - This option will probably be too expensive in most cases and thus not cost/benefit efficient.

2. At a fixed rate (1-100%) of the working cost (cfr. ship time and manpower used).
    - What determines the fixed rate? Distance covered, loss of planned ship time, time needed for recovery, etc.
    - Depends on the good will of both parties, since such a fixed rate will be quoted ad hoc based on the actual situation
    - A 50% rate as used in Eurofleets and other EC-funded ship time projects seems to be fair, but will this satisfy the ship operator? What is the gain for the ship operator? Again an ad hoc decision will be made on the actual situation.

3. Via bartering
    - As in OFEG ship time can be shared via bartering, wherein no money changes hands but points are exchanged as credit. This credit can then be used by the ship operator in future actions, all or not related to rapid response interventions.
    - Bartering implies a rapid response working group wherein the participating members can use the research vessels of the participating members in exchange of points. Such a group, like OFEG, will be rather small and thus will not be very efficient for rapid response since the group's fleet will be limited.
    - Notwithstanding the above argumentation OFEG or Eurofleets (2) or ERVO could start up a rapid response working group wherein bartering of research vessels for rapid response is foreseen. If Eurofleets (2) or ERVO could initiate this, the available fleets would be more sufficient to sustain rapid response by research vessels as if OFEG would initiate such a working group..
    - Bartering, as pointed out by the OFEG experience, is very rewarding for all parties involved. On the down side, not all equipment owners are ship owners and vice versa. The consequent re-exchange of barter points can thus be a problem.

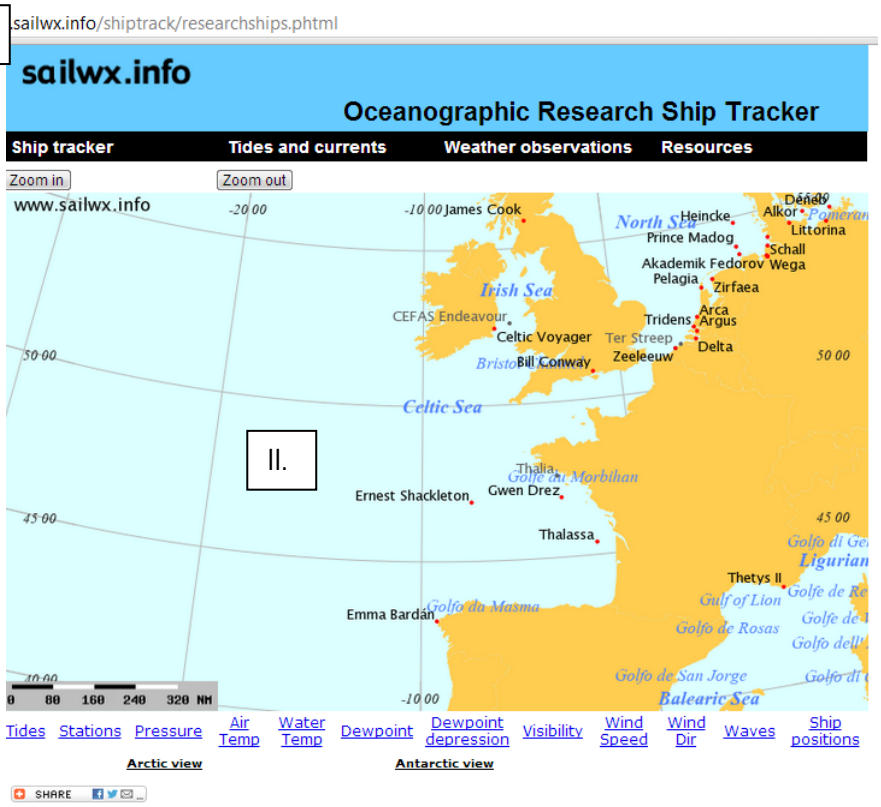
In some cases, the scientific instrumentation is insured and the insurance can be used to (partially) pay for the rapid response action. Insurance will not cover the real value of a lost instrument as was explained above, but only the price of an instrument. Therefore the cost of the rapid response action will often be larger than the effective price of the lost instrument. E.g. the insurance at RBINS-MUMM of scientific equipment clearly states that search and rescue of a lost instrument will be covered up to the price of the equipment, taking into account the age of the instrument. Insurance can be helpful to cover a part of the cost of a rapid response intervention but will have limited (positive) influence on the cost/benefit analyses that should be made prior to the rapid response intervention.

To conclude the rapid response capabilities of research vessels can be very useful but there is a need for an organization to coordinate the rapid response interventions, mainly in relation to the financial aftermath of such actions. ERVO and/or OFEG seem to be logic candidates to coordinate such a working group. Besides this, rapid response interventions of research vessel will stay an ad hoc operation which depends on the actual situation related to the lost scientific equipment and the nearby research vessels. EurOcean and Eurofleets(2) could help with limited adjustments of the research vessel data base by adding a direct link to the research vessel programs/schedules and with an integration of the AIS and VOS research vessel location data within the database.

ANNEX 1: Localization of a research Vessel

I. Go to the following website: http://www.sailwx.info/shiptrack/researchships.phtml
II. Zoom in to the location of the lost instrument by right-clicking on the shown map
III. The ships in the selected area are listed below by “at sea” or “in port/not reporting”
IV. Select the vessel “at sea” closest to the last location of the lost instrument
V. the update time of the research vessel position is indicated in the list below; if update time is older than one day, select another vessel

I.



II.

Ship database updated 12:34 Sunday, 05 May 2013 UTC (time now 13:00 UTC)

III.

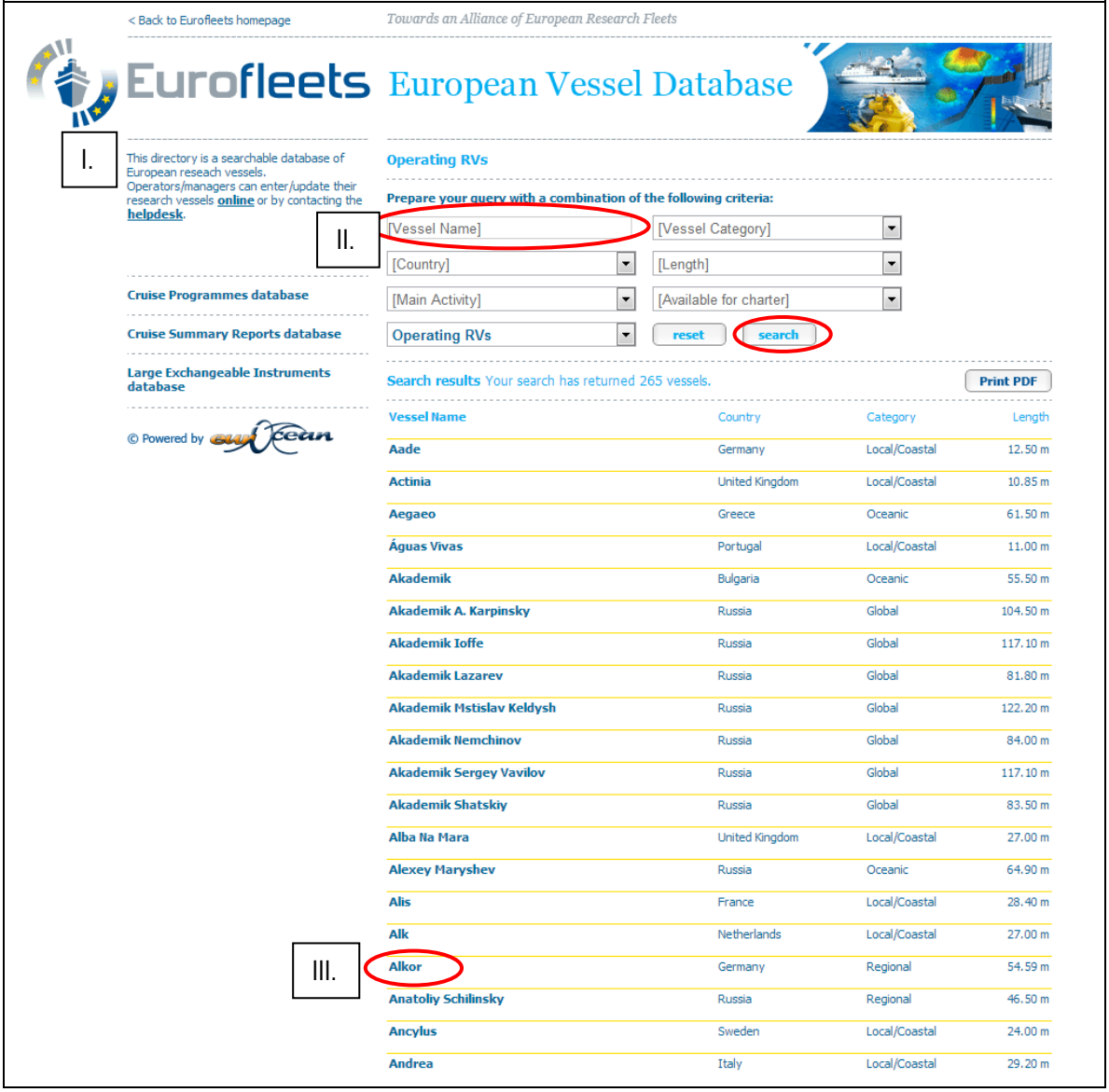
Ship	last reported (UTC)	position	Callsign	Country	Details
Ships at sea:					
Zeeleeuw	2013-May-05 1233	N 51°14', E 002°56'	ORBB	Belgium	OCEANIC
Gunnar Thorson	2013-May-05 0608	N 57°26', E 010°32'	OUDU	Denmark	OCEANIC
Gwen Drez	2013-May-05 0832	N 46°55', W 003°29'	FZYB	France	OCEANIC
Thetys II	2013-May-05 1233	N 43°06', E 005°53'	FGTO	France	
Thalassa	2013-May-05 1212	N 45°25', W 002°01'	FNFP	France & Spain	OCEANIC
Alkor	2013-May-04 1533	N 54°37', E 010°59'	DBIG	Germany	OCEANIC
Alkor	2013-May-04 1907	N 57°36', E 009°59'	DBND	Germany	OCEANIC
Atair	2013-May-05 1230	N 53°52', E 008°43'	DBBI	Germany	OCEANIC
Deneb	2013-May-05 1234	N 54°30', E 012°30'	DBBA	Germany	OCEANIC
Heincke	2013-May-05 1000	N 54°48', E 007°12'	DBCK	Germany	OCEANIC ALIAS
Komet	2013-May-05 1017	N 54°08', E 008°52'	DBBF	Germany	OCEANIC
Littorina	2013-May-05 1225	N 54°23', E 010°10'	DLMG	Germany	OCEANIC
Poseidon	2013-May-05 1200	N 37°18', W 014°12'	DBKV	Germany	OCEANIC
Prof. Albrecht Penck	2013-May-05 1232	N 54°07', E 012°05'	Y3CH	Germany	OCEANIC
Schall	2013-May-05 1232	N 53°31', E 008°35'	DNBQ	Germany	OCEANIC
Solea	2013-May-05 1232	N 53°47', E 007°09'	DBFI	Germany	OCEANIC
Walther Herwig III	2013-May-05 1231	N 53°31', E 008°35'	DBFR	Germany	OCEANIC

V.

IV.

ANNEX 2: Contacting the contact person of the research vessel

I. Go to the following website: http://www.eurofleets.eu/rvs/
II. Give in the of the research vessel in the query [Vessel Name] and click on the “search” button; the research vessel will be listed below
III. Right-click on the vessel’s name and you will be forwarded to the vessel’s information page



Vessel Name	Country	Category	Length
Aade	Germany	Local/Coastal	12.50 m
Actinia	United Kingdom	Local/Coastal	10.85 m
Aegaeo	Greece	Oceanic	61.50 m
Águas Vivas	Portugal	Local/Coastal	11.00 m
Akademik	Bulgaria	Oceanic	55.50 m
Akademik A. Karpinsky	Russia	Global	104.50 m
Akademik Ioffe	Russia	Global	117.10 m
Akademik Lazarev	Russia	Global	81.80 m
Akademik Mstislav Keldysh	Russia	Global	122.20 m
Akademik Nemchinov	Russia	Global	84.00 m
Akademik Sergey Vavilov	Russia	Global	117.10 m
Akademik Shatskiy	Russia	Global	83.50 m
Alba Na Mara	United Kingdom	Local/Coastal	27.00 m
Alexey Maryshev	Russia	Oceanic	64.90 m
Alis	France	Local/Coastal	28.40 m
Alk	Netherlands	Local/Coastal	27.00 m
Alkor	Germany	Regional	54.59 m
Anatoliy Schilinsky	Russia	Regional	46.50 m
Ancylus	Sweden	Local/Coastal	24.00 m
Andrea	Italy	Local/Coastal	29.20 m

IV. On the vessel's information page the name and contact information of the person who acts as POC is indicated

V. On the vessel's information page also a link is provided to the vessel's website often with indication of the cruise plan which can provide additional information about the vessels current/future positions and activities

VI. Contact the POC of the vessel and provide the "Description of incident, instrument and proposed intervention"