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付属資料1：協議議事録

1-1. インセプション・レポート説明時


MINUTES OF THE MEETINGS
ON
INCEPTION REPORT
FOR
PREPARATORY SURVEY
ON
THE FISHERY RESEARCH VESSEL PROJECT
IN
THE KINGDOM OF MOROCCO


In accordance with the Minutes of Meeting (M/M) for the above survey signed on October 27, 2011, the JICA Preparatory Survey Team headed by Mr. Hiroshi Fukao (hereinafter referred to as "the Japanese side") explained and discussed the contents of the Inception Report (IC/R) with the National Institute for Fisheries Research (INRH) of the Ministry of Agriculture and Marine Fisheries (MAPM) and relevant agencies concerned of the Kingdom of Morocco, on September 4 and 6, 2012.

The list of attendants is attached in Annex 1.

Salient issues discussed and agreed upon by both sides are shown in the pages attached hereto.

Casablanca, September 6, 2012


Mr. Mustapha FAIK
Director General
National Institute for Fisheries Research
(INRH),
Ministry of Agriculture and Marine Fisheries,
Kingdom of Morocco


Mr. Hiroshi FUKAO
Team Leader
JICA Survey Team

1. The Japanese side submitted 6 copies (in French) and 2 copies (in English) of the Inception Report on "Preparatory Survey on the Fishery Research Vessel Project in the Kingdom of Morocco" and explained to the Moroccan side on September 4, 2012.

2. The following are the main issues discussed and agreed on by both sides in relation to the Inception Report.

2.1 Both sides basically agreed on the approaches, methods and procedures of the Survey as described in the said Report.

2.2 The first field survey in Morocco has been commenced on September 3, 2012 and will be conducted until October 17, 2012 (for 45 days). The results of the Survey will be outlined in the Interim Report and explained to the Moroccan side at the second field survey, which is scheduled to conduct in the late November 2012.

2.3 Logistic matters

(1) Regular meeting

The Japanese side proposed to the Moroccan side to hold a regular meeting to discuss on the progress of the Survey and to formulate the project concept and scope. The Moroccan side agreed to hold the said meeting. Next regular meeting is scheduled on September 18, 2012 at INRH.

(2) Counterpart

The Moroccan side agreed to appoint counterparts to attend on the weekly meeting mentioned in the above and the contact persons at each agency concerned to assist the Survey Team in collecting data and information and exchange of project ideas. The list of counterparts and contact persons will be presented to the Japanese side.

(3) Survey permits

The Moroccan side agreed to make arrangements for obtaining necessary permits from agencies/organizations concerned for conduct of field surveys, as requested by the Survey Team.

(4) Arrangement of separate meetings

The Moroccan side will arrange the separate meetings with the relevant departments/divisions of INRH and other agencies/organizations concerned for the Survey Team.

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2.4 Political approach

The Director General of INRH suggested that the Project will be formulated based on technical and socio-economic aspects in principle, but should be also promoted through the political approach on the top level authorities. In this regard, the INRH will coordinate different agencies concerned of Ministry of Agriculture and Marine Fisheries (MAPM), Ministry of Economy and Finance (MEF), Ministry of Foreign Affairs (MAE) and Ministry of High Education and Scientific Research (MESRS) so that the best plan will be smoothly selected by the Moroccan side among the several option plans which will be proposed by the Survey Team.

2.5 Technical matters

The following are major technical comments from the Moroccan site.

(1) Regional based survey and research

Although the eco-system survey projects by foreign cooperation in the North-west African water will be terminated in short period, there is a scientific demand to continue such a regional based survey and research. In this regard, the proposed research vessel should be designed to use for this purpose with the leadership of Morocco.

(2) Demand for eco-system survey for aquaculture development

There is the increasing demand for aquaculture by both government and private sectors in Morocco in recent years. However, the eco-system survey which data can be used for aquaculture development is not able to be conducted by the existing research vessels. In this context, the proposed research vessel should be also be used for this purpose.

(3) Deployment System of Research Vessels

The INRH plans to deploy the proposed research vessel for multi-purpose use for stock assessment survey of both pelagic and demersal fisheries resource as well as marine eco-system survey. Although one of the existing vessel "Charif Al Idrissi" has been operated more than 25 years, INRH will deploy 3 research vessels including this vessel for several years after the proposed vessel is constructed. When the "Charif Al Idrissi" reaches to the time to be abandoned, the required survey will be conducted with 2 research vessels, namely, "Al Amir Moulay Abdallah" and the proposed new vessel.

(4) Coastal Research Vessel

The INRH is also planning to reinforce its fleet for conducting survey in the coastal shallow water (less than 15m in depth) in the future, since the both existing and proposed research vessels cannot cover such shallow water.

(5) Target Survey Zone

The target zone for survey to be conducted by the proposed research vessel will be mainly the Moroccan water, but will be expanded depending on demands for regional eco-system survey which has been conducted by foreign research vessels but will be terminated in short period.

(6) Target Survey Depth

The existing research vessels cannot cover the depth more than 500m due to the limited capacity, while INRH plans to conduct deep-sea shrimp stock assessment survey and the fish larva circulation model analysis up to the depth of 1,500m. Appropriate survey depth should be further examined based on the INRH's technical capability and economic viability.

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List of Participants

INRH

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|-------------------------|---|
| 1. Mr. Mustapha FAIK | Director General |
| 2. Ms. Souad KIFANI | Secretary General |
| 3. Mr. Abdelmalek FARAJ | Chef de Dept. Ressources Halieutique |
| 4. Mr. Omar ETTAHIRI | Chef de Dept. Oceanographie et Aquaculture |
| 5. Mr. Ali AFERYAO | Chef de Div. Logist, Apro et Gestion des Navire |
| 6. Mr. Mohamed AMRANJ | Chef de Administratif, Financier et Comptable |
| 7. Dr. Naoki TOJO | JICA Expert (Ecosystem & Monitoring) |

JICA

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| 1. Ms. Yuko MORIKAWA | Adjointe au Représentant Résident |
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Study Team

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|---------------------------|-------------------------|
| 1. Mr. Hiroshi FUKAO | Team Leader |
| 2. Mr. Yoshiki KONDO | Member |
| 3. Mr. Masaaki SHIBATA | Member |
| 4. Mr. Hideki TSUBATA | Member |
| 5. Mr. Hideyuki WATANABE | Member |
| 6. Mr. Abdelfattah RIACHE | Interpreter/Coordinator |
| 7. Mr. Aziz SASSI | Interpreter |

**MINUTES OF THE MEETINGS
ON
INTERIM REPORT
FOR
PREPARATORY SURVEY
ON
THE FISHERY RESEARCH VESSEL PROJECT
IN
THE KINGDOM OF MOROCCO**

In accordance with the Inception Report for the above survey, the JICA Preparatory Survey Team headed by Mr. Hiroshi Fukao (hereinafter referred to as “the Japanese side”) has carried out the 1st field survey during September 3 to October 17, 2012 in collaboration with the National Institute for Fisheries Research (INRH) of the Ministry of Agriculture and Marine Fisheries (MAPM) and relevant agencies concerned of the Kingdom of Morocco (hereinafter referred to as “the Moroccan side”). As a result of the 1st field survey in Morocco and the 1st post survey analysis in Japan, the Japanese side elaborated the Interim Report, and explained and discussed on the outline of the Interim Report to the Moroccan side, on November 19 - 23, 2012.

The list of attendants is attached in Annex 1.

Salient issues discussed and agreed upon by both sides are shown in the pages attached hereto.

Casablanca, November 27, 2012



Mr. Mustapha FAIK
Director General
National Institute for Fisheries Research (INRH)
Ministry of Agriculture and Marine Fisheries
The Kingdom of Morocco



Mr. Hiroshi FUKAO
Team Leader
JICA Survey Team

1. The Japanese side submitted 6 copies (in French), 2 copies (in English) and those electronic data of the Interim Report on “Preparatory Survey on the Fishery Research Vessel Project in the Kingdom of Morocco” and explained to the Moroccan side on November 19 - 21, 2012.
2. The following are the main issues discussed and agreed on by both sides in relation to the outline of the Interim Report.
 - 2.1 The Moroccan side basically agreed on the contents of the Interim Report, and promised to carefully examine the said report and submit the written comments to the Japanese side before December 8, 2012.
 - 2.2 The 2nd field survey in Morocco has been commenced on November 17, 2012 and will be conducted until December 1, 2012 (for 15 days including travel days). The results of the survey will be further analyzed in Japan and elaborated in the Draft Final Report (DF/R). The DF/R will be submitted and explained to the Moroccan side at the 3rd field survey, which is scheduled to conduct during January 16 – 30, 2013.

2.3 Technical matters

The following are major technical comments from the Moroccan side.

(1) Linkage with “Plan Halieutis”

The Moroccan side requested the Japanese side to more emphasize the linkage between the “Plan Halieutis” and the proposed new research vessel, analyzing how and to what extent the proposed vessel will contribute to realize the “Plan Halieutis”.

(2) Concept of Project Benefits

The Moroccan side basically understood and agreed to the concept of project economic benefits estimated by the Japanese side. In addition to the economic analysis based on three scenario, the Moroccan side requested the Japanese side to make the impact analysis (to what extent socio-economic damages would be brought), if one of the most important fish species in Morocco (sardine, octopus or shrimp) was collapse, which might be occurred in case of “without Project”.

The Moroccan side suggested that the economic benefit estimated from the development of deepsea fisheries resources is not scientifically acceptable due to the limited data. Both parties agreed to eliminate this benefit from economic analysis.

In addition, the following three aspects should be highlighted as the important project effects:

- Ecosystem approach, in conformity with the strategies of the “Plan Halieutis”.
- Contribution in the regional cooperation to raise the influence of Morocco.
- Collaboration with universities through joint survey in the field of marine environment.

(3) International code/convention to be examined



The Japanese side explained the following international code / convention, and the proposed new research vessel will have to be the larger if it is necessary to follow therewith.

a) SPS 2008 (Code of safety for special purpose ships) - IMO

In this code, the vessel should be designed not to damage stability, even any compartment (sub-division) is filled with water. This code is applicable to more than 500 gross tonnage special purpose ships with more than 12 special passengers (researchers), but not a compulsory rules and standards.

b) MLC 2006 (Maritime Labor Convention) – ILO (to be effective on 20 August 2013)

It is stipulated in this convention that sleeping rooms shall be situated above the load line, if it is necessary to follow this convention. However, Morocco does not ratify to this convention for the time being. This Convention shall be applied to all vessels except those categorized into “Fishing Vessels” (Fishery research vessels are categorized into “Fishing Vessels” in Morocco).

The Moroccan side confirmed that the proposed new fisheries research vessel does not need to follow both of the above code and convention, and that this matter should be remarked in the DF/R, knowing as a reference that no fisheries research vessels in Japan (“which” deleted) follow the above code and convention for the time being since all the fisheries research vessels in Japan have the number of researchers onboard not more than 12 persons and are categorized into “Fishing Vessels” respectively.

(4) Scientific equipment options

The Japanese side explained that the proposed scientific sonar “Simrad ME70” is still under development of techniques on data treatment (methodology of calibration, TS determination and so on) in the world. There are many issues to be solved and/or developed before data can be used at level of scientific assurance for stock assessment, so that it will be heavy burden for INRH to make “Simrad ME70” effective to the practically scientific level. In this context, the Japanese side strongly recommended to introduce “Furuno FSV-30R” as an option instead of “Simrad ME70” in terms of not only the easiness in usage but also in price (Approx. 160 millions Yen would be able to reduce if “Furuno FSV-30R” was selected). The Moroccan side requested the Japanese side to provide with some scientific references on the matter for his further examination, and the Japanese side promised to try to provide such references.

Since there is a possibility that the issues on operation of ME70 would be solved by the time of the project implementation, both parties agreed that ME70 would be remained in the project design for the time being, and would be reexamined the appropriateness of ME70 so as to make final decision at the stage of detailed design (preparation of tender documents).

(5) Organizations for project implementation

The Moroccan side confirmed that the following organizational system would be applied for implementation of the Project.

1) Borrower : Ministry of Economy and Finance (MEF)



2) Implementing agency : MAPM (for administrative matters) and INRH (technical matters)

3) O&M agency (owner) : INRH

(6) Technical Assistance (T/A)

Both sides discussed on necessary components and scope of a Yen-loan attached technical assistance (T/A) to be provided in connection with the Project. The Moroccan side insisted that the proposed T/A should be concentrated to technical transfer on operation and maintenance of the new research vessel including all the equipment. The research activities on analysis and evaluation of fisheries resources and ecosystem will be studied at the final evaluation of the current Technical Cooperation Project (Capacity Development of Fisheries Resource Monitoring for Sustainable Management of Small Pelagic Resources in the Kingdom of Morocco) by JICA.

Both sides reached to mutual understanding on the following outline:

1) Objectives: Capacity building for operation and maintenance of the new research vessel

2) Fields of expertise:

a) Operation and management of research vessel (Chief advisor)

b) Navigation / Fishing technique (pelagic and deep sea trawl in particular)

c) Mechanical engineering (main and aux. engines, refrigeration machinery, etc.)

d) Scientific equipment (Sedigraph and FlowCam in particular)

e) Acoustic apparatus (Sonar, Multi-beam echo-sounder, and ADCP in particular)

3) Period: 3 years

(including 1 year before the arrival and 2 years after the arrival of the new research vessel)

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Annex-I

List of Participants

INRH

- | | |
|-------------------------|--|
| 1. Mr. Mustapha FAIK | Director General |
| 2. Dr. Abdelmalek FARAJ | Chef de Dept. Ressources Halieutique |
| 3. Dr. Omar ETTAHIRI | Chef de Dept. Oceanographie et Aquaculture |
| 4. Dr. Najib CHAROUKI | Chef de URD Diagnostic et Etat d'Exploitation
des ressources |
| 5. Mr. Ali AFERYAD | Chef Division d Approvisionnement, Logistique, et
Gestion des Navires |
| 6. Mr. Driss BENZAZZI | Chef Service Gestion des Navires |
| 7. Mr. Ali BENHRA | Chef de Laboratoire d'Ecotoxicologie |
| 8. Dr. Naoki TOJO | JICA Expert (Ecosystem & Monitoring) |

Study Team

- | | |
|---------------------------|-------------------------|
| 1. Mr. Hiroshi FUKAO | Team Leader |
| 2. Mr. Kazunori UWATOKO | Co-Team Leader |
| 3. Mr. Yoshiki KONDO | Member |
| 4. Mr. Hideki TSUBATA | Member |
| 5. Mr. Abdelfattah RIACHE | Interpreter/Coordinator |



**MINUTES OF THE MEETINGS
ON
DRAFT FINAL REPORT
FOR
PREPARATORY SURVEY
ON
THE FISHERY RESEARCH VESSEL PROJECT
IN
THE KINGDOM OF MOROCCO**

This Minutes of Meetings is prepared and signed between the JICA Preparatory Survey Team headed by Mr. Hiroshi Fukao (hereinafter referred to as “the Survey Team”) and the relevant agencies concerned of the Kingdom of Morocco (hereinafter referred to as “the Moroccan side”) including the Ministry of Economy and Finance (MEF), the Ministry of Agriculture and Marine Fisheries (MAPM) and the National Institute for Fisheries Research (INRH), to confirm the results of a series of discussions made during the 3rd field survey. The Survey Team explained and discussed on the outline of the Draft Final Report to the Moroccan side, on January 18, 21 and 28, 2013.

The list of attendants is attached in Annex 1.

Salient issues discussed and agreed upon by both sides are shown in the pages attached hereto.

Casablanca, February 6, 2013

Mr. Moha BICHA
Chef de la Division Asie, Afrique et Amérique
Direction of Budget
Ministry of Economy and Finance (MEF)

Mr. Abdelouahed BENABBOU
Directeur de la Coopération et des Affaires
Juridiques
Direction of Cooperation and Legal Affairs
Department of Marine Fisheries (DPM)
Ministry of Agriculture and Marine Fisheries
(MAPM)

Mr. Mustapha FAIK
Director General
National Institute for Fisheries Research (INRH)
Ministry of Agriculture and Marine Fisheries
The Kingdom of Morocco

Mr. Hiroshi FUKAO
Team Leader
JICA Preparatory Survey Team

Ministry of Agriculture and Marine Fisheries
The Kingdom of Morocco

1. The Survey Team submitted the following numbers of copies and those electronic data of the Draft Final Report on "Preparatory Survey on the Fishery Research Vessel Project in the Kingdom of Morocco" and explained to the Moroccan side on January 18 and 21, 2013.
 - For MEF : 4 copies (French) and 1 copy of electronic data
 - For MAPM : 4 copies (French) and 1 copy of electronic data
 - For INRH : 8 copies (French), 2 copies (English) and 1 copy of electronic data
2. The following are the main issues discussed and agreed on by both sides in relation to the outline of the Draft Final Report.
 - 2.1 The Moroccan side basically agreed on the contents of the Draft Final Report, and promised to carefully examine the said report and submit the written comments to the Survey Team before February 8, 2013.
 - 2.2 The 3rd field survey in Morocco has been conducted from January 16, 2013 to January 30, 2013 (for 15 days including travel days). The results of the survey will be further analyzed in Japan and elaborated in the Final Report (F/R). The F/R will be officially delivered to the Moroccan side through the JICA Morocco Office by the end of April 2013. To expedite the evaluation work by the Moroccan side as requested, the Survey Team will be able to send the electronic file of the Final Report prior to official delivery subject to approval by JICA.

2.3 Project Implementation System

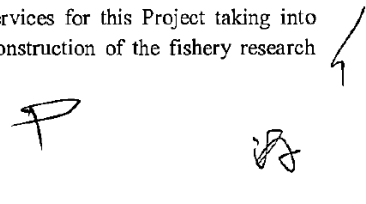
This point is still under discussion by the Moroccan side, and is to be finally confirmed later, after the receipt of the F/R from the Survey Team. The Moroccan side suggested to the Survey Team to consider the following two options:

	Option 1	Option 2
Borrower	INRH	MEF
Implementing Agency	INRH	INRH / DPM
Operation and Maintenance Agency	INRH	INRH
Ownership of the Vessel	INRH	INRH

The Moroccan side also suggested that it is indispensable to make INRH as the Owner of the Vessel unless otherwise the Vessel cannot be operated and maintained by INRH according to the Moroccan law. The Survey Team requested INRH to provide the past experiences on loan management with other donors or private banks, and on procurement of ships or other large equipment/facility, so as to justify the INRH's capability of project management, and INRH promised to provide such information.

2.4 Consulting Services

The Moroccan side understood the necessity of consulting services for this Project taking into account the specific technologies needed for designing and construction of the fishery research



vessel as well as ensuring smooth implementation of the Project.

The Survey Team explained that the consulting services to be covered by grant under Step loan would be only for assistance in preparation of PQ documents and tender documents including technical specifications, and all the consulting services after PQ announcement would be covered by loan portion. The Moroccan side understood this matter.

2.5 Project Cost

The MEF suggested that it is extremely desirable to reduce the cost of this operation so as to explain more advantages of the STEP loan to the Minister of MEF and finally to get special approval by the head of government. In this regard, the Moroccan side asked the Survey Team the possibility to cover by grant for the training of officers and crew at shipyard as well as during transport of the Vessel from shipyard to Morocco. The Survey Team answered that it is rather difficult to make a decision since the terms of reference of the consultants to be used under the loan and the consultants for Technical Assistance are not yet determined in detail at this stage, and it would be reconsidered by JICA with the clarification of terms of reference of consultants.

The MEF also suggested that the commitment charge (0.1%) should not be charged for this project, since it seems not fair that the Moroccan side is charged, in case that Japanese or foreign company causes delay. The MEF added that the Project is implemented in the framework of ODA and also under friendship between Morocco and Japan, but not on commercial basis. JICA Morocco Office explained to the Moroccan side the indispensability of payment of commitment charge. However, the Moroccan side mentioned that it would be hardly acceptable for the time being.

The Survey Team explained that the Project Cost described in the DF/R was modified as a result of recalculation using the JICA cost estimation software, considering the JICA standard rates of price escalation, consultant's remuneration and so on. The Moroccan side understood this matter.

2.6 Technical Assistance

INRH is planning to set up the independent technical unit (Business Unit) inside of INRH in 2014 by reorganizing the existing division of research vessel operation and maintenance, so as to be able to reinforce the technical capability and to provide technical service more flexibly and more largely to fisheries technologies aspects. In this regard, the INRH wished to expand the period of the Technical Assistance attached to the Project so as to cover the training of staff of Business Unit soonest after its establishment. According to the INRH, the concept of Business Unit will be also applied to the existing Aquaculture Special Center in M'diq, Fishery Products Valorization Special Center in Agadir and Fish Pathology Laboratory in Tanger. The Survey Team will examine the possibility and discuss with JICA headquarters on the matter and inform to the INRH before the submission of Final Report.

2.7 Project Effects

2.7.1 Contribution to "Plan Halieutis"

INRH suggested that it is important to include in the F/R what inputs would be given for realization of the "Plan Halieutis" by the operation of proposed Vessel, in addition to the contribution to the outputs of "Plan Halieutis" which have already given on the DF/R.

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2.7.2 Additional analysis on economic loss

INRH suggested that it should be analyzed in the F/R that how much cost is needed if INRH has to charter the similar vessel in case that the Project is not implemented, so as to justify the advantage of procurement of the proposed Vessel.

2.7.3 Indicators for Operation and Effects

The Survey Team suggested each indicator for operation should be carefully designed to the level, which could be actually achieved. Based on the survey and navigation plan revised by INRH, the Survey Team will examine and finalize the indicators for operation to the practical level.

2.7.4 Expected Benefits

The Survey Team made the rapid interview survey to some of owners of coastal purse seiners in Agadir and El Jadida, to collect data and information necessary for quantification of economic benefit related to the reduction of fuel cost, which is expected by providing the information on fishing ground through the analysis of survey data collected by a new research vessel. The Survey Team will try to estimate such benefit within the collected information, and the result will be reflected to the F/R.

2.7.5 Economic Analysis

The Survey Team explained that the estimated EIRR would be also recalculated according to the change of Project Cost, but would not much affect to the result of economic analysis.

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List of Participants

INRH

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|--------------------------|--|
| 1. Mr. Mustapha FAIK | Director General |
| 2. Dr. Abdelmalek FARAJ | Chef de Dept. Ressources Halieutique |
| 3. Mr Mounir ITAOUI | Chef de Dept. Appui à la Recherche |
| 4. Dr. Omar ETTAHIRI | Chef URD Oceanographie |
| 5. Dr. Najib CHAROUKI | Chef de URD Diagnostic et Etat d'Exploitation
des ressources |
| 6. Mr. Ali AFERYAD | Chef Division d Approvisionnement, Logistique, et
Gestion des Navires |
| 7. Mr. Mohamed AMARANI | Chef Division Administrative, Financière et Comptable |
| 8. Mr. Ali BENHRA | Chef de Laboratoire d'Ecotoxicologie |
| 9. Mr. Abdelatif BOUMAAZ | Chef de Labo Prospection des Ressources Demersales |
| 10. Dr. Naoki TOJO | JICA Expert (Ecosystem & Monitoring) |

DPM

- | | |
|-------------------------|---|
| 1. Mr. Youssef OUATI | Head of Cooperation Division |
| 2. Mr. Aomar BOURHIM | Homologue expert JICA of Cooperation Division |
| 3. Mr. Atsushi ISHIKAWA | JICA Expert |

MEF

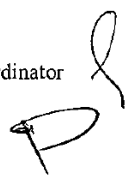
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|------------------------------|---|
| 1. Mr. Moha BICHA | Chef de Division Asie, Afrique et Amériques |
| 2. Mr. Mohamed LEMGHARI | Chef de Service Asie, Afrique et Amériques |
| 3. Mr. Abdelouahab BELMADANI | Chef de Service de Dept. des Pêches Maritimes |

JICA Morocco Office

- | | |
|-----------------------|------------------------------------|
| 1. Mr. Eihiko OBATA | Représentant Résident |
| 2. Ms. Kimiyo YAMAURA | Chargée de programmes de prêts APD |
| 3. Ms. Siham MALKI | Program Officer |

Survey Team

- | | |
|---------------------------|-------------------------|
| 1. Mr. Hiroshi FUKAO | Team Leader |
| 2. Mr. Yoshiki KONDO | Member |
| 3. Mr. Hideki TSUBATA | Member |
| 4. Mr. Abdelfattah RIACHE | Interpreter/Coordinator |



付属資料 2. 現有調査船の運航・維持管理実績

2-1. 現有調査船の運航実績

「AL AMIR MOULAY ABDALLAH」(AMA号)の調査観測記録							
年次	航海・調査期間(発 ~ 終)		日数	航海・調査海域	中層トロール	海洋学調査	底曳トロール
2001							
2002							
2003							
2004							
2005					2001/2012年 水深28~230m 1789回操業		
2006							
2007							
2008						2001/2012年年 水深18~470m 約3000回操業	
2009	2008年12月29日	2009年1月8日	11	Tarfaya ~ Safi			
	2009年1月24日	2009年2月4日	12	Fnideq ~ Oued Laou			
	2009年2月21日	2009年3月2日	10	Ghir岬 ~ Juby岬 カナリア海			
	2009年3月7日	2009年3月21日	15	25° N ~ 23° Nの中部大西洋			
	2009年4月18日	2009年4月25日	8	Ghir岬 ~ Juby岬 カナリア海			
	2009年4月28日	2009年5月7日	10	Ghir岬 ~ Tifnit			
	2009年5月21日	2009年6月8日	19	Bojdour ~ Lagouira			
	2009年6月14日	2009年6月18日	5	Ghir岬 ~ Juby岬 カナリア海			
	2009年6月30日	2009年7月30日	31	Cantin岬 ~ Bojdour岬			
	2009年9月29日	2009年10月15日	17	Bojdour ~ Lagouira			
	2009年10月24日	2009年10月28日	5	Ghir岬 ~ Juby岬			
	2009年10月29日	2009年11月13日	16	Bojdour岬 ~ Lagouira			
	2009年11月14日	2009年11月26日	13	Blanc岬 ~ Bojdour岬			
	2009年12月9日	2009年12月30日	22	ダクラ ~ Cantin岬			
		合計	194				
2010	2010年3月19日	2010年4月5日	18	Bojdour岬 ~ Barbas岬			
	2010年4月12日	2010年4月20日	9	Ghir岬 ~ Juby岬 ラスまで			
	2010年5月19日	2010年6月1日	14	Cantin岬 ~ Bojadour岬			
	2010年6月3日	2010年6月20日	18	Bojadour岬 ~ Blanc岬			
	2010年6月22日	2010年6月28日	7	Ghir岬 ~ Juby岬 ラスまで			
	2010年8月28日	2010年9月4日	8	Ghir岬 ~ Juby岬			
	2010年9月8日	2010年9月9日	2	アガディール付近			
	2010年10月30日	2010年11月13日	15	タンジェ ~ Sidi Ifni			
2010年11月24日	2010年12月30日	37	Cantin岬 ~ Blanc岬				
		合計	128				
2011	2011年1月12日	2011年1月24日	13	Fnideq ~ Jabha 北部大西洋			
	2011年2月10日	2011年2月15日	6	アガディール湾			
	2011年3月3日	2011年4月6日	35	Cantin岬 ~ Bojadour岬 Bojadour岬 ~ Blanc岬			
	2011年5月19日	2011年6月3日	16	Cantin岬 ~ Bojadour岬			
	2011年6月5日	2011年6月11日	7	Jadiada ~ Safi付近			
	2011年6月23日	2011年7月10日	18	Bojadour岬 ~ Blanc岬			
	2011年7月18日	2011年7月25日	8	Fnideq ~ Jabha			
	2011年7月27日	2011年8月3日	8	地中海			
	2011年10月5日	2011年10月9日	5	アガディール湾			
	2011年10月18日	2011年10月20日	3	アガディール湾			
	2011年11月18日	2011年11月28日	11	Saida ~ Sebta			
	2011年11月30日	2011年12月6日	7	Spartel岬 ~ Cantin岬			
	2011年12月17日	2012年1月21日	36	Bojadour岬 ~ Blanc岬			
		合計	173				

「CHARIF AL IDRISSE」(CAI号)の調査観測記録							
年次	航海・調査期間(発 ~ 終)		日数	航海・調査海域	中層トロール	海洋学調査	底曳トロール(水深/操業)
2006	11月						20~100m/90回
	12月						20~1000m/125回
2007	2月~3月						20~1000m/125回
	4月~5月						20~1000m/90回
	6月~7月						20~1000m/125回
	9月~10月						20~100m/90回
	10月~11月						20~100m/90回
	11月~12月						20~100m/90回
2008	5月~6月						20~100m/90回
	9月						20~100m/50回
	10月~11月						20~100m/90回
2009	2009年2月19日	2009年3月5日	15	Lagouira ~ Dakhla			20~100m/100回
	2009年3月6日	2009年3月12日	7	Dakhla			
	2009年3月13日	2009年3月23日	11	Dakhla ~ Boujdour			
		合計	33				
2010	2010年4月29日	2010年5月10日	12	タンジェ ~ タンタン			20~1000m/56回
	2010年5月16日	2010年6月8日	24	Bojadour岬 ~ Blanc岬			20~100m/95回
	2010年6月8日	2010年6月28日	21	Saidia ~ Sebta			20~800m/84回
	2010年7月8日	2010年7月31日	24	北部大西洋			20~1000m/82回
	2010年9月1日	2010年9月21日	21	Martil		物理探査	20~100m/70回
	2010年10月25日	2010年11月14日	21	Bojadour岬 ~ Blanc岬			20~100m/90回
	2010年11月25日	2010年12月18日	24	Bojadour岬 ~ Blanc岬			20~100m/90回
		合計	147				
2011	2011年1月10日	2011年1月10日	1	アガディール湾			
	2011年2月1日	2011年2月13日	13	Spartel岬 ~ Sidi Ifni			20~1000m/84回
	2011年3月20日	2011年4月9日	21	Bojadour岬 ~ Blanc岬			20~100m/90回
	2011年4月20日	2011年5月1日	12	タンジェ ~ Sidi Ifni			水深20~1000m 84回操業
	2011年5月5日	2011年5月25日	21	タンタン ~ タンジェ		物理探査	
	2011年6月3日	2011年6月24日	22	Bojadour ~ Blanc岬			20~100m/95回
	2011年8月5日	2011年8月22日	18	タンジェ ~ Sidi Ifni			20~1000m/90回
	2011年9月24日	2011年10月21日	28	Bojadour ~ Lagouira			20~200m/120回
	2011年11月16日	2011年12月2日	17	タンジェ ~ Sidi Ifni			20~1000m/90回
2011年12月3日	2011年12月7日	5	Sebta ~ Saida			20~800m/63回	
		合計	158				
2012	3月						20~1000m/100回
	3月~4月						20~800m/63回
	4月~5月						20~100m/120回
	5月~6月					物理探査	
	6月						20~800m/63回
	6月~7月						20~1000m/102回

2-2. 現有調査船の維持管理状況

(1) 「AL AMIR MOULAY ABDALLAH」(AMA号)の状況

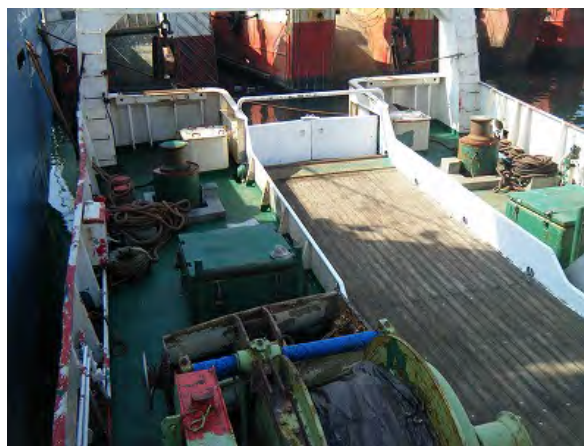
<○：問題なし、△：整備が必要、×：故障して使用不能>

項目	台数	仕様	状況	備考
ウインドラス	1	油圧、24.5kN×12m/min	○	
キャブスタン	2	油圧、14.7kN×20m/min	△	ドラムを整備の必要あり
舵取機	1	電動油圧、 24.7kN-m、2.2kW	○	
トロールウインチ	2	油圧、φ20mm×2000m 34.7kN×80m/min	△	
ネットウインチ	1	油圧、5.0m ³ 、 34.3kN×45m/min	○	
ライン/ネットホーラー	1	油圧、4.9kN×80m/min	△	ドラムを整備の必要あり
デッキクレーン	1	EFFER25000-3S、 荷重2.0tf	○	
海洋観測ウインチ	1	鶴見精機、油圧、 φ6.0mm×500m(SUS)、 7.8kN×50m/min	△	ケーブルを整備の必要あり
CTDウインチ	1	鶴見精機、油圧、 φ6.0mm×500m(armored) 7.8kN×50m/min	○	
A-ギャロス	1	油圧、荷重5.9kN	○	
トロールウインチ油圧ポンプ	2	主機駆動、215lit/min	○	
甲板機械油圧ポンプ	1	電動37kW、57lit/min	○	
空気調和装置	1	圧縮機11kW、ファン3.7kW	○	
機力通風機	3	0.4kW、0.4kW、0.2kW	△	通風筒を修理の必要あり
作業艇	1	アキレス、ゴム/FRP複合型、 4.2m×25PS 船外機	○	
計量魚群探知機	1	シムラット EK-60、 38kHz/120kHz Analyzer BI-500	○	
ADCP	1	Sunwest SW2000-115、 115kHz、水深500m	×	
CTD	1	SeaBird SBE-911plus	○	
魚体長測定器	1	デジタル式、0～50cm	○	
Weight scale	1	電気式、0～6000g	○	
主機関	1	ヤンマー6N21A-UN、防振支持 1000PS×800rpm	○	
減速機	1	ヤンマーRGC160K、 Gear ratio 2.79	○	
プロペラ/ プロペラシャフト	1	CPP、ペラ径2100mm 軸径170mm	○	
主発電機関	2	ヤンマー6HAL2-N、防振支持 156PS×1500rpm	○	
主空気圧縮機	1	サリ S8A、5.5kW	○	
補助空気圧縮機	1	サリ S5AR、5PSディーゼル	○	
機関室給気ファン	2	3.7kW	△	通風筒を修理の必要あり
造水機	1	サクラ VA-30、4t/day	○	

増速機	1	カワサキ SGC56M-47、280PS	○	
冷凍機	1	ダイキン RKS-8F、5.5kW	○	
探照灯	1	キセノン 2kW	×	
投光器	12	500W	△	一部故障
オートパイロット	1	トキメック PR-2202-SL-025S	○	
魚群探知機	1	フルノ FE1282、記録式	×	
スキャニングソナー	1	フルノ CSH-53	×	



(AMA号) 暴露甲板船首部



(AMA号) 暴露甲板船尾部



(AMA号) 操舵室内部、操舵スタンド



(AMA号) 操舵室内部、海図台



(AMA号) 海洋観測ウインチφ6.0mm×500m(SUS)



(AMA号) CTDウインチφ6.0mm×500m(armored)



(AMA 号) 音響研究室



(AMA 号) トロールウインチ



(AMA 号) ウエット研究室



(AMA 号) 主機関 736 kW



(AMA 号) 機関室 主空気圧縮機



(AMA 号) 機関室床下の配管

(2) 「CHARIF AL IDRISSI」(CAI号)の状況

【換装の有無】換装：新たな機器に交換、原機：新造時の機器をそのまま使用

【整備の状況】○：問題なし、△：整備が必要、×：故障して使用不能

項目	メーカー	換装の有無	整備の状況	備考
レーダー	スキャンマー	換装	○	
漁網監視装置	スキャンマー	換装	○	
スピードログ	ANTHEA, BEN	換装	○	
スピードログ	Sperry Marine	換装	○	
イーパブ	RESCURE	換装	○	
GMDSS 無線装置	SAILOR	換装	○	
魚群探知機		原機	○	
磁気コンパス				
VHF 無線機	SAILOR	換装	○	
船内指令装置	SOREMAR	換装	○	
ウィンチ操作盤		原機	○	
GPS		原機	○	
コースプロッター		換装	○	電子海図付き
船内指令装置	SOREMAR	換装	○	
調理室機器		換装	○	一部は原機を整備
食堂冷蔵庫	SAMSUNG	換装	○	
食堂テレビ	SAMSUNG	換装	○	
汚物処理装置		原機	△	
主機関	ABC	換装	○	ANGLO-BELGIAN-CORP.
主機前増速機		原機	○	
主発電機	NIIGATA	原機	○	2台
ビルジポンプ		原機	○	電動機は換装
FO 清浄機	アルファラバル	換装	○	
主空気圧縮機	ABC	換装	○	主機関と一緒に交換
補助空気圧縮機	ABC	換装	○	主機関と一緒に交換
主機清水冷却機	アルファラバル	換装	○	
造水器		換装	○	造水能力 2t/day
冷凍機		原機	○	
主配電盤		原機	○	
空気槽		換装	○	主機関と一緒に交換
海洋観測ウィンチ		原機	×	
ウインドラス		原機	△	
ネットウインチ		原機	○	
ワープウインチ		原機	○	
救命筏	SEA-SAFE	換装	○	
機関室工作機械		原機	○	
船体		原機	△	



(CAI 号) 右舷船首全景



(CAI 号) 船尾全景



(CAI 号) 左舷船首と喫水



(CAI 号) 中央部ネットウインチ



(CAI 号) 船尾全景



(CAI 号) 海洋観測ウインチ



(CAI 号) 操舵室



(CAI 号) 主席調査員室



(CAI 号) 換装した調理室



(CAI 号) 換装した主機関



(CAI 号) 機関室床下のポンプ類



(CAI 号) 機関室補機類

2-3. 関連インフラ状況

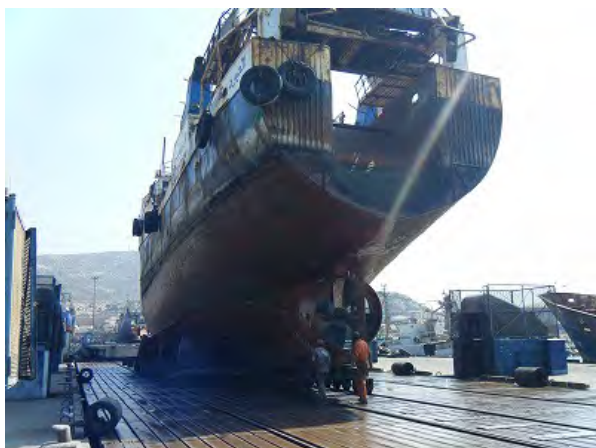
<アガディール港>



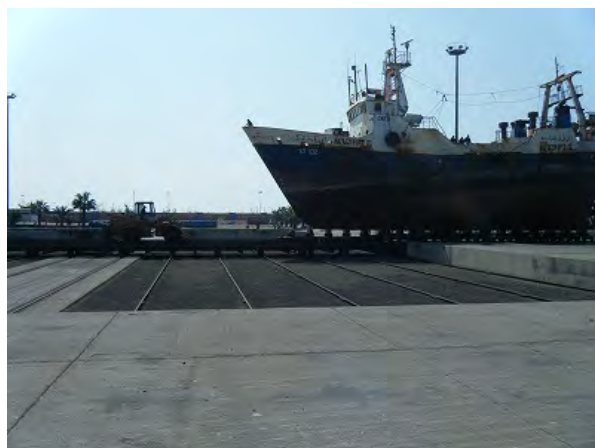
造船所で建造中の漁船



シンクロリフト



シンクロリフトで上架中の漁船



ドックヤード内を移動



係留中のAL HASSANI号、その奥にAMA号がロングサイドで係留中



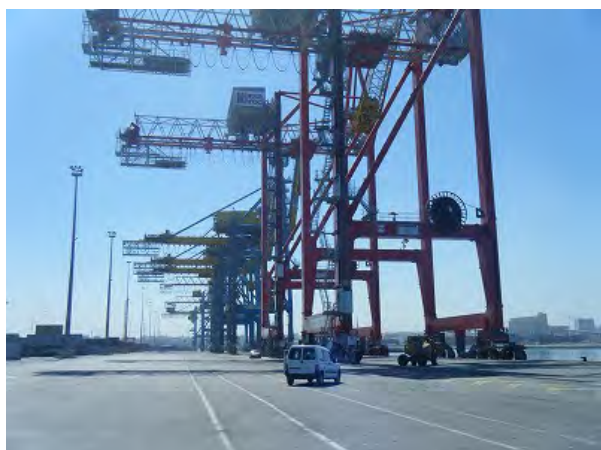
<カサブランカ港>



漁港に係留中の CAI 号と船首喫水 (2.30m)



Chantiers & Ateliers du Maroc (CAM)



カサブランカ商港のコンテナヤード



カサブランカ商港の岸壁

<タンジェ港>



改修拡張工事中



完成予想図

付属資料 3. 海洋調査・運航計画

3-1. 現状

調査水域	地中海	大西洋側北部	大西洋側中部	大西洋側南部	計
	Saidia - Ceuta	Tanger - Safi	Safi - Cap Bojador	Cap Bojador - Cap Blanc	
海岸線延長(マイル)	197	305	520	390	
	190	270	495	165+204(Dakhla-Blanc)	
A. 浮魚資源及び海洋調査					
平均調査測線長さ(深さ=20-500m)(マイル)	12	30	30	45	117
調査測線数(海岸線に直角方向)	49	30	53	36	168
中層トロール調査海区数	35	50	80	80	245
海洋観測定点数	45	45	70	70	230
調査航海距離合計(マイル)	785	1,205	2,110	2,010	6,110
B. 底魚調査					
調査測線長さ(D=20-1,000m)(マイル)	25	40	35	55	155
底曳トロール調査海区数(10x10マイル)	65	105	*	120	290
調査航海距離合計(マイル)	1,728	2,448	*	3,312	7,488
調査時間数					
1) 音響調査	79	121	211	201	611
2) 中層トロール調査	35	50	80	80	245
3) 海洋調査	23	23	35	35	115
同上 日数(日)	11.3	16.1	27.2	26.3	80.9
調査日数合計(日)	14.1	18.1	29.2	29.5	90.8
1) 底曳きトロール	144	204	*	276	624
2) 航海	144	204	*	276	624
同上 日数(日)	12.0	17.0	*	23.0	52.0
調査日数合計(日)	13.9	20.7		30.6	65.2
航海日数(Agadir - Saidia)	2.8				9.9
休息日数(Tanger / Laâyoune)		2.0	2.0		
航海日数(Cap Blanc - Agadir)				3.2	13.2
航海日数(Casa - Saidia)	1.9				
休息日数(Tanger / Dakhla)		2.0		0.5	
航海日数(Tangier - Larache & Ifni - Casa)		1.7			
航海日数(Casa - Tarfaya & Lagouira - Casa)				7.1	
前提条件:					
1. 1日当たり調査時間	: 12 時間(昼間のみ)				
2. 調査速度					
1) 航海	10 ノット				
2) 音響調査	10 ノット				
3) 表層・中層トロール	4 ノット				
4) 底曳きトロール	3 ノット				
5) 海洋調査	停止(定点観測)				
3. 単位調査時間					
1) 音響調査	調査測線に沿って10 ノットで調査				
2) 表層・中層トロール	1時間/回				
3) 底曳きトロール	1.5時間/回				
4) 海洋調査	0.5時間/回				

3-2. 新規調査船の調査・運航計画

新規調査船(春季調査)										
調査項目	調査回数					調査時間数				
	大西洋南部 (Cap Blanc~Cap Boujidor)	大西洋中部 (Cap Boujidor~Cap Centini)	大西洋北部 (Cap Centini~Cap Sparte)	地中海 (Cap Sparte~Saïda)	合計	大西洋南部 (Cap Blanc~Cap Boujidor)	大西洋中部 (Cap Boujidor~Cap Centini)	大西洋北部 (Cap Centini~Cap Sparte)	地中海 (Cap Sparte~Saïda)	合計
調査測線数	13	17	10	14	54	80	53	30	17	179
着底トロール	53	35	20	11	119	32	38	40	82	192
0-200m	16	41	20	5	56	48	55	43	13	158
200-800m	19	22	17	5	63	66	75	48	80	248
800-1500m	186	204	132	162	683	270	33	25	35	135
CTD / ロゼット採水	65	85	70	33	270	43	21	13	18	88
ポンゴ / マルチネット	33	43	25	35	135	16	17	10	14	54
海底堆積土	13	17	10	14	54	3	4	3	4	14
表層トロール	7	9	5	7	27	19	22	17	5	63
中層トロール	19	22	17	5	63	128	134	87	77	428
海底地形	1276	1336	874	773	4259	18.2	19.2	13.1	13.5	64.0
音響調査距離(海里)										31.1
合計										

新規調査船(秋季)										
調査項目	調査回数					調査時間数				
	大西洋南部 (Cap Blanc~Cap Boujidor)	大西洋中部 (Cap Boujidor~Cap Centini)	大西洋北部 (Cap Centini~Cap Sparte)	地中海 (Cap Sparte~Saïda)	合計	大西洋南部 (Cap Blanc~Cap Boujidor)	大西洋中部 (Cap Boujidor~Cap Centini)	大西洋北部 (Cap Centini~Cap Sparte)	地中海 (Cap Sparte~Saïda)	合計
調査測線数	35	52	30	49	166	40	26	15	8	89
着底トロール	27	18	10	6	60	16	19	20	14	69
0-200m	8	10	10	7	34	24	28	21	6	79
200-800m	10	11	9	3	32	50	50	41	37	178
800-1500m	145	165	100	105	515	33	43	25	35	135
CTD / ロゼット採水	65	85	70	35	270	16	21	13	16	68
ポンゴ / マルチネット	33	43	25	35	135	6	6	3	2	245
海底堆積土	80	80	50	5	245	10	11	9	3	18
表層トロール	12	13	7	5	36	209	252	123	86	652
中層トロール	10	11	8.5	2.5	32	23.3	25.8	13.9	9.5	72.6
海底地形	2087	2516	1228	692	6523					89.7
音響調査距離(海里)	435	794	392	214	1834					
測線間距離(海里)										
合計										

夜間調査時間の検討(新規調査船:秋季)										
水域	表層トロール/日	CTDx2/3	マルチネットx2/3	測線間移動x1/2	海底堆積土x2/3	着底トロール	中層トロール	夜間調査時間/日	夜間残存時間/日	
大西洋南部	23	33	22	22	11	80	6	8.8	3.2	
大西洋中部	26	33	28	40	14	73	6	9.0	3.0	
大西洋北部	14	27	17	20	8	56	3	11.1	0.9	
地中海	10	24	23	11	12	28	2	11.8	0.2	
合計	73	118	90	92	45	237	18	41	7	

備考:地中海水域における夜間残存時間は殆どないが、測線及び地点間隔が近接していることから問題はない。

3-3. 現有調査船の調査・運航計画

(1) AMA号+AI Hassani号

AMA号(春季)									
調査項目	調査回数			合計	調査時間数			合計	
	大西洋南部 (Cap Blanc~Cap Boujdor)	大西洋中部 (Cap Boujdor~Cap Cantin)	大西洋北部 (Cap Cantin~Cap Sparteil)		地中海 (Cap Sparteil~Saida)	大西洋南部 (Cap Blanc~Cap Boujdor)	大西洋中部 (Cap Boujdor~Cap Cantin)		大西洋北部 (Cap Cantin~Cap Sparteil)
調査船数	35	52	30	166	0	0	0	0	0
着底トロール	0	0	0	0	0	0	0	0	0
CTD / ロゼット採水	132	148	90	461	50	50	41	37	178
ポング / マルチネット	52	68	40	216	34	26	20	28	108
海底性標土	0	0	0	0	0	0	0	0	0
表層トロール	80	80	50	215	80	80	50	55	245
中層トロール	0	0	0	0	0	0	0	0	0
海底地形	0	0	0	0	0	0	0	0	0
音響調査距離(海里)	2087	2516	1228	6823	209	252	123	69	652
測線間距離(海里)	435	794	352	1834	26.2	23.7	14.3	9.8	73.9
									91.1
AMA号(秋季)(水深200m迄)									
調査項目	調査回数			合計	調査時間数			合計	
	大西洋南部 (Cap Blanc~Cap Boujdor)	大西洋中部 (Cap Boujdor~Cap Cantin)	大西洋北部 (Cap Cantin~Cap Sparteil)		地中海 (Cap Sparteil~Saida)	大西洋南部 (Cap Blanc~Cap Boujdor)	大西洋中部 (Cap Boujdor~Cap Cantin)		大西洋北部 (Cap Cantin~Cap Sparteil)
調査船数	120	25	55	230	180	38	83	45	345
着底トロール	0	0	0	0	0	0	0	0	0
CTD / ロゼット採水	20	8	15	46	10	4	8	2	24
ポング / マルチネット	0	0	0	0	0	0	0	0	0
海底性標土	0	0	0	0	0	0	0	0	0
表層トロール	0	0	0	0	0	0	0	0	0
中層トロール	0	0	0	0	0	0	0	0	0
海底地形	0	0	0	0	0	0	0	0	0
音響調査距離(海里)	1200	280	550	2000	120	25	55	30	230
					20.7	4.4	9.7	5.2	39.9
									57.3
AL HASSANI号(秋季)(水深:200 ~ 800 m)									
調査項目	調査回数			合計	調査時間数			合計	
	大西洋南部 (Cap Blanc~Cap Boujdor)	大西洋中部 (Cap Boujdor~Cap Cantin)	大西洋北部 (Cap Cantin~Cap Sparteil)		地中海 (Cap Sparteil~Saida)	大西洋南部 (Cap Blanc~Cap Boujdor)	大西洋中部 (Cap Boujdor~Cap Cantin)		大西洋北部 (Cap Cantin~Cap Sparteil)
調査船数	0	0	0	0	0	0	0	0	0
着底トロール	34	15	50	129	68	30	100	60	258
CTD / ロゼット採水	5	4	10	29	2	2	5	5	15
ポング / マルチネット	0	0	0	0	0	0	0	0	0
海底性標土	0	0	0	0	0	0	0	0	0
表層トロール	0	0	0	0	0	0	0	0	0
中層トロール	0	0	0	0	0	0	0	0	0
海底地形	0	0	0	0	0	0	0	0	0
音響調査距離(海里)	340	190	500	1290	34	15	50	30	129
					7.0	3.1	10.3	6.3	26.7
									44.3

水域	表層トローラー1回/日	CTD×1/2	マルチネット×1/2	測線間移動×1/2	夜間調査時間/日	夜間残存時間/日
大西洋南部	24	25	13	22	3.5	2.6
大西洋中部	26	25	17	40	4.1	2.6
大西洋北部	14	21	10	20	4.5	3.1
地中海	10	18	14	11	5.4	4.3
合計	74	89	54	92	18	13

新規調査船及びAMA号の前提条件:

調査項目	1.5 (水深0~200m)	2 (水深200~800m)	2.5 (水深800~1,500m)	新規調査船(春/秋季)及 AMA号(春季)	AMA号/HAS号(秋季)
着底トローラー				Agadir-Sadia	2.5
CTD / ロゼット採水	0.5 (定点観測地点)	0.3 (表層トローラー地点)		Safi-Agadir-Safi	1
ポンゴ/マルチネット	0.5			Boujodor - Laayoune - Boujodor	0.7
海底堆積土	0.5			Laayoune - Agadir	3
表層トローラー	1			Total	7.2
中層トローラー	0.5			Nador	1
海底地形	1			Tanger	1
音響調査速度(ノット)	10			Agadir	4
夜間のCTD / マルチネットの割合 (新規秋季)	0.5	0.7 (AMA号春季)		Laayoune	2
夜間の表層トローラーの割合(新規秋季, AMA号春季)	0.3			Dakhla	2
夜間の測線間音響調査の割合(新規秋季, AMA号春季)	0.5			Total	10
1日に行う音響調査の割合(AMA号秋季)	0.5				
調査グリッド平均間隔(着底トローラー)		10			
1日の調査時間(着底トローラー, AMA号, HAS号)		15			
	Sadia - Ceuta			海岸線延長(海里)	水層 0-200m
	Tanger - Safi			197	1341
	Safi - Cap Bojador			305	8431
	Cap Bojador - Cap Blanc			520	6429
				390	14824
					水層 200-800m
					2979
					5343
					3762
					3441

(2) CAI 号

AWA号との精度校正(1年次)																						
底曳 (<200 m)	1.5 時間/回																					
深海底 (200 à 800 m)	2 時間/回																					
CTD	0.5 時間/回																					
定年間平均距離	10 マイル																					
航行速度	7 ノット																					
1日当りの調査活動時間	15 時間/日																					
調査水域間移動/寄港日数	23 日																					
調査地点																						
調査水域	曳網調査		海洋調査		定年間移動(マイル)																	
	0-200m	200-800m	CTD																			
大西洋南部 (Cap Blanc – Cap Boujdor)	120	34	0		1540																	
大西洋中部 (Cap Boujdor – Sidi Ifni)	25	15	0		400																	
大西洋北部 (Sidi Ifni – Cap Spartel)	55	50	0		1050																	
地中海 (Cap Spartel – Saïdia)	30	30	0		600																	
合計	230	129	0		3590																	
所要時間																						
調査水域	曳網調査		海洋調査		調査時間合計		定年間移動時間		調査・航海日数													
	0-200m	200-800m	CTD																			
大西洋南部 (Cap Blanc – Cap Boujdor)	180	68	0		248		220		16.5		14.7		4.5									
大西洋中部 (Cap Boujdor – Sidi Ifni)	38	30	0		68		57		4.5		3.8		1.2									
大西洋北部 (Sidi Ifni – Cap Spartel)	83	100	0		183		150		12.2		10.0		3.5									
地中海 (Cap Spartel – Saïdia)	45	60	0		105		86		7.0		5.7		2.5									
合計	345	258	0		603		513		40.2		34.2		11.7		86.1		11.0		97.1			

新規調査船との精度校正(2年次)

底曳 (<200 m)	1.5 時間/回
深海底 (200 à 800 m)	2 時間/回
CTD	0.5 時間/回
定年間平均距離	10 マイル
航行速度	7 ノット
1日当たり調査活動時間	15 時間/日
調査水域間移動/寄港日数	23 日

調査地点	曳網調査		海洋調査		定年間移動(マイル)
	0-800m	800-1500m	CTD		
大西洋南部 (Cap Blanc - Cap Boujdor)	87	0	0	0	870
大西洋中部 (Cap Boujdor - Sidi Ifni)	103	0	0	0	1030
大西洋北部 (Sidi Ifni - Cap Spartel)	62	0	0	0	620
地中海 (Cap Spartel - Saïdia)	72	0	0	0	720
合計	324	0	0	0	3240

所要時間	曳網調査		海洋調査		調査時間合計	定年間移動時間			調査・航海日数			
	0-800m	800-1500m	CTD			調査	定年間移動	航海	調査	定年間移動	航海	
大西洋南部 (Cap Blanc - Cap Boujdor)	131	0	0	0	131	8.7	8.3	4.5	8.7	8.3	4.5	
大西洋中部 (Cap Boujdor - Sidi Ifni)	155	0	0	0	155	10.3	9.8	1.2	10.3	9.8	1.2	
大西洋北部 (Sidi Ifni - Cap Spartel)	93	0	0	0	93	6.2	5.9	3.5	6.2	5.9	3.5	
地中海 (Cap Spartel - Saïdia)	108	0	0	0	108	7.2	6.9	2.5	7.2	6.9	2.5	
合計	486	0	0	0	486	32.4	30.9	11.7	32.4	30.9	11.7	
移動/寄港日数												75.0
												11.0
												86.0

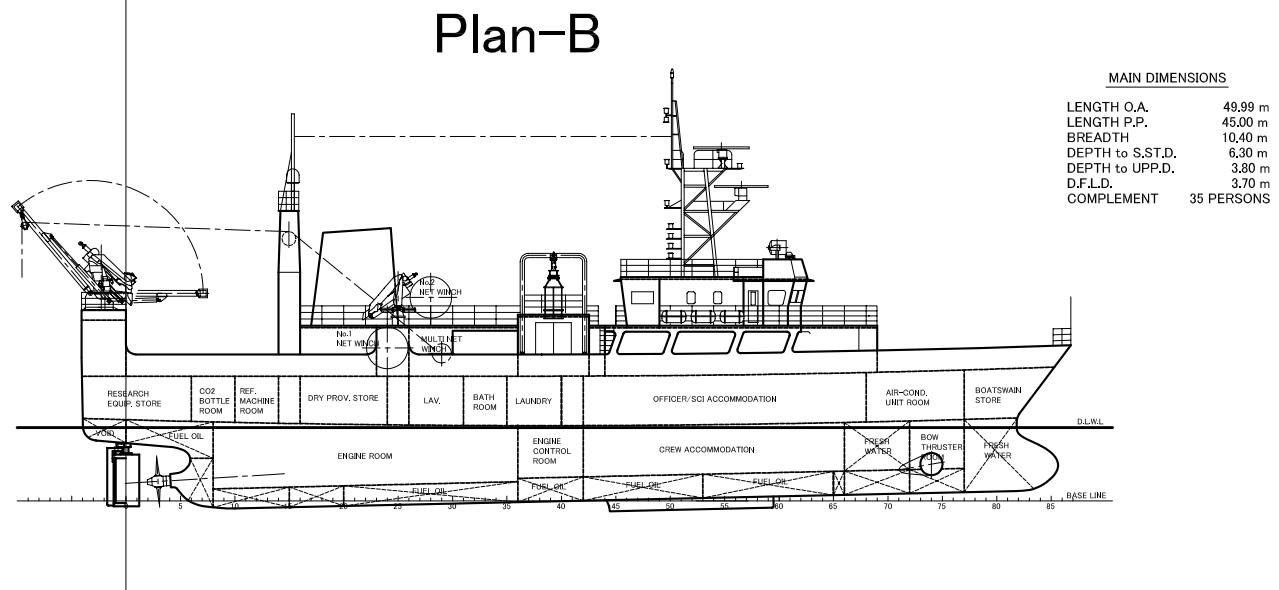
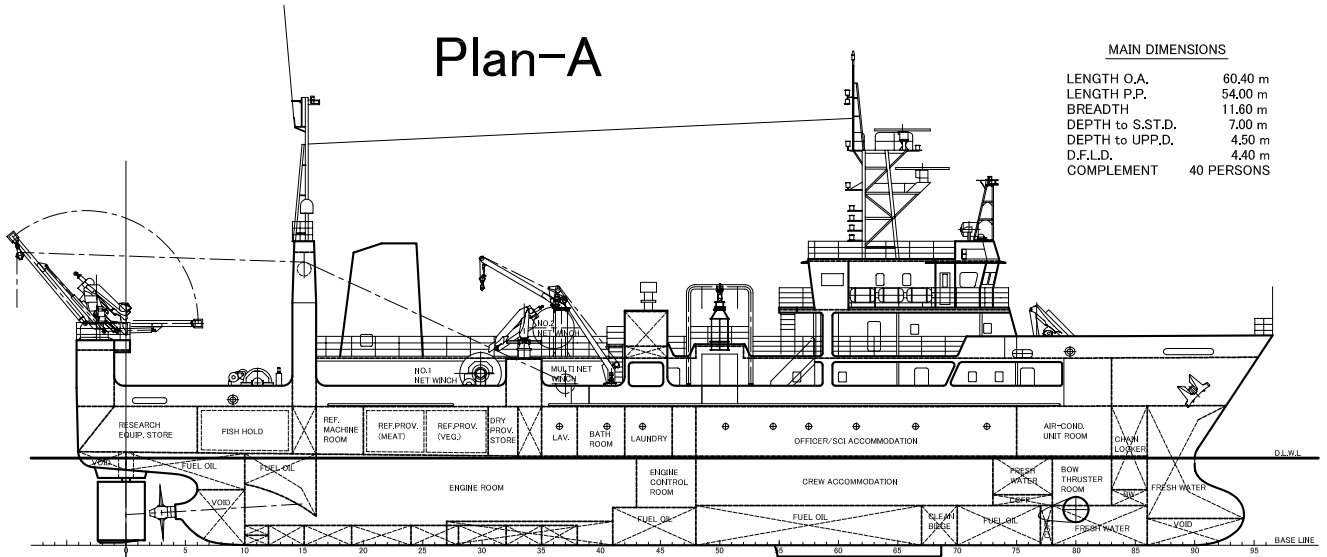
移動/寄港日数	曳網調査		海洋調査		調査時間合計	定年間移動時間			調査・航海日数			
	0-800m	800-1500m	CTD			調査	定年間移動	航海	調査	定年間移動	航海	
大西洋南部 (Cap Blanc - Cap Boujdor)	18265	23087			23087							
大西洋中部 (Cap Boujdor - Sidi Ifni)	10191	12349			12349							
大西洋北部 (Sidi Ifni - Cap Spartel)	13765	19609			19609							
地中海 (Cap Spartel - Saïdia)	4320	4824			4824							

水深別面積	曳網調査		海洋調査		調査時間合計	定年間移動時間			調査・航海日数			
	0-800m	800-1500m	CTD			調査	定年間移動	航海	調査	定年間移動	航海	
大西洋南部 (Cap Blanc - Cap Boujdor)	385	2	2.29		2.29							
大西洋中部 (Cap Boujdor - Sidi Ifni)	43	2	0.26		0.26							
大西洋北部 (Sidi Ifni - Cap Spartel)	588	8	3.50		3.50							
地中海 (Cap Spartel - Saïdia)	198	1	1.18		1.18							
合計	755	11	4.49		4.49							
			11.72		11.72							
			22.72		22.72							

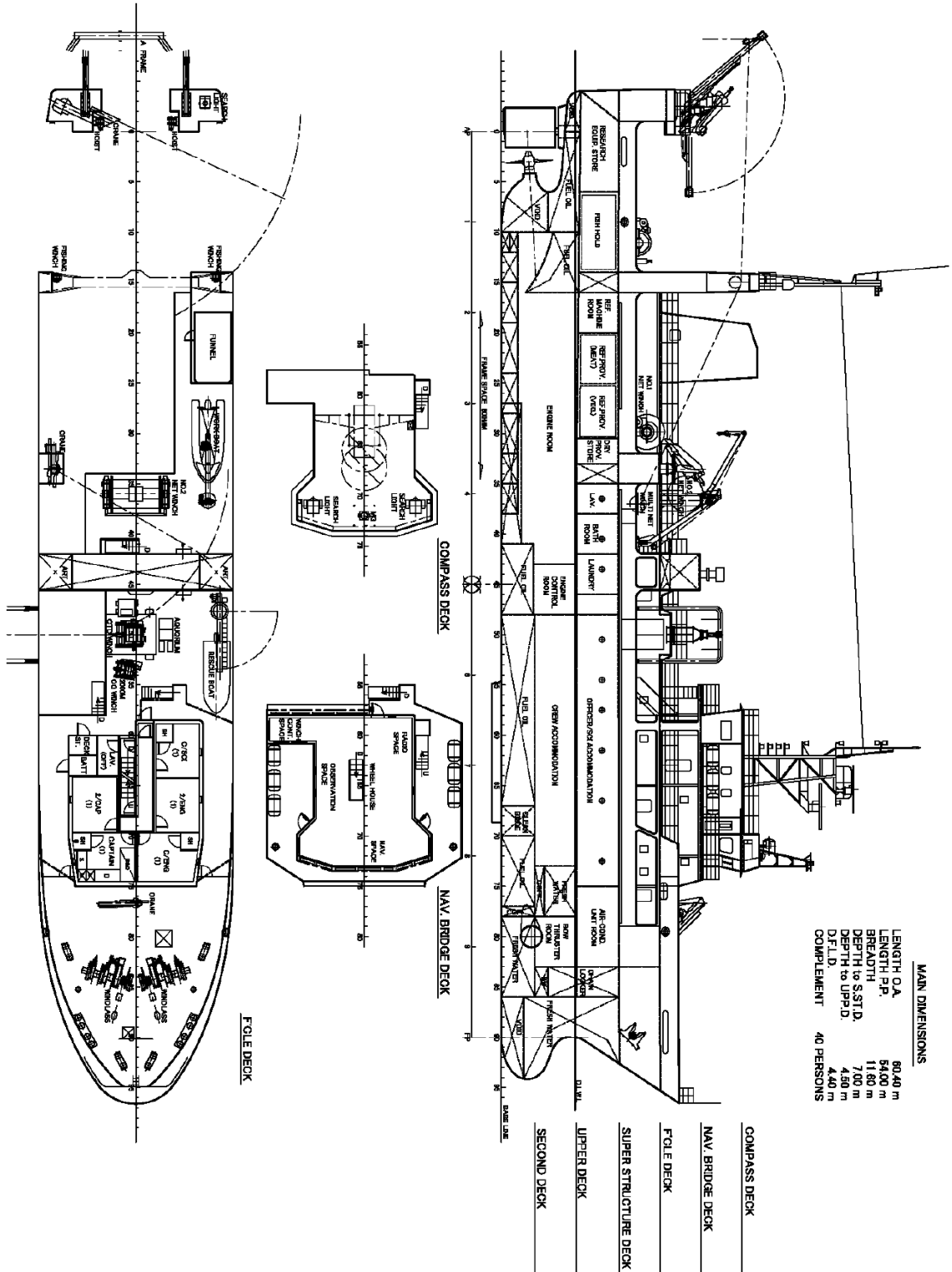
付属資料 4. 概略設計図及び基本仕様

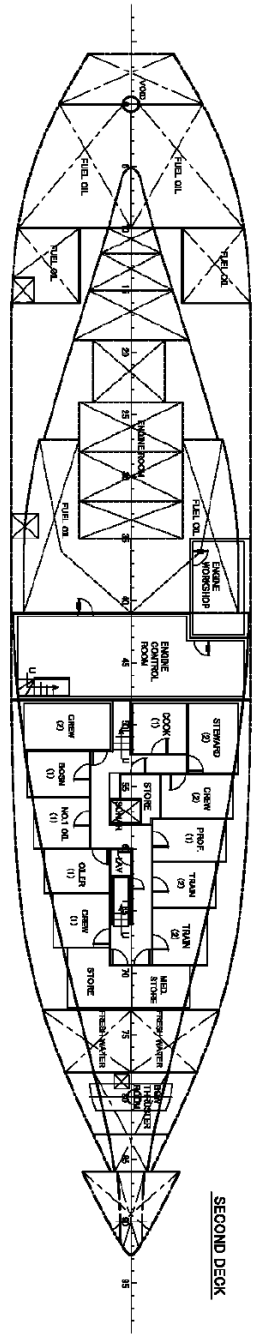
4-1. 概略設計図

(1) プランA-プランB 比較

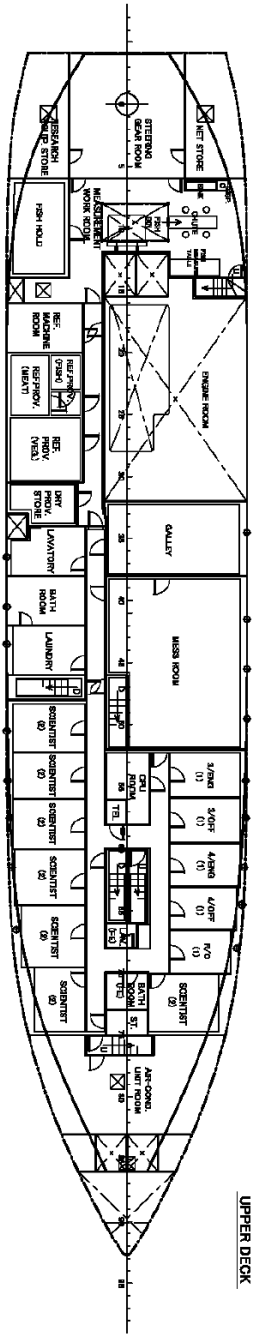


(2) プラン A

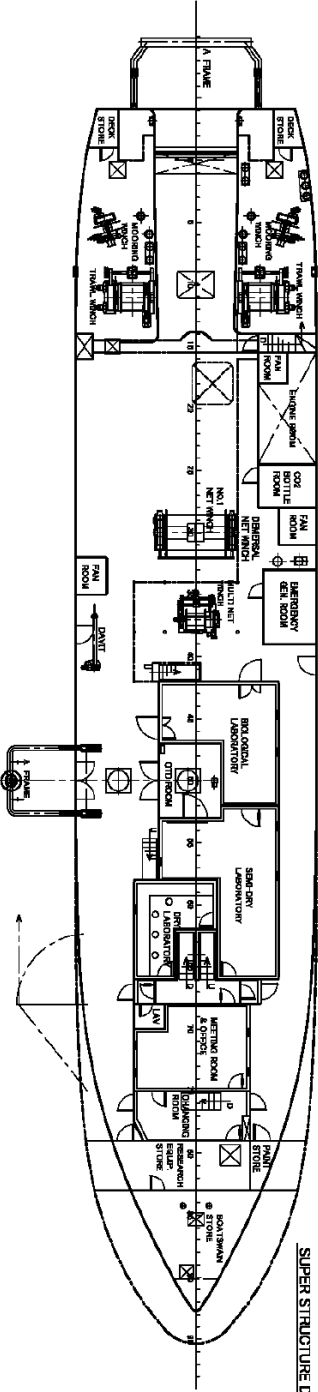




SECOND DECK

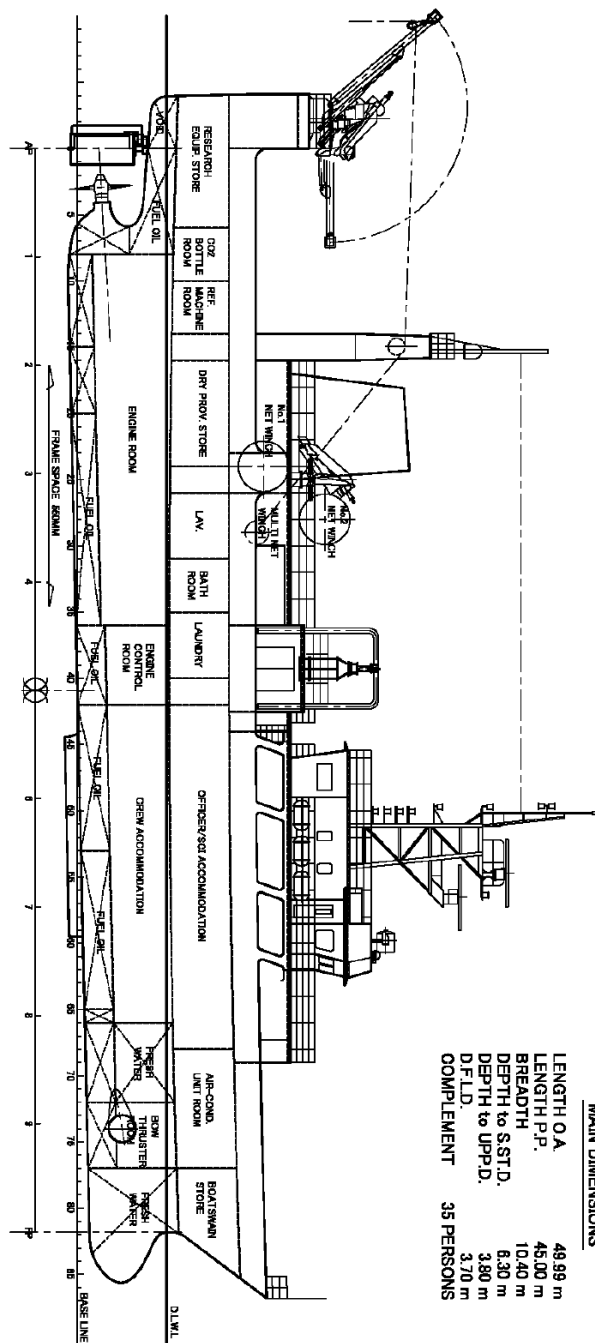
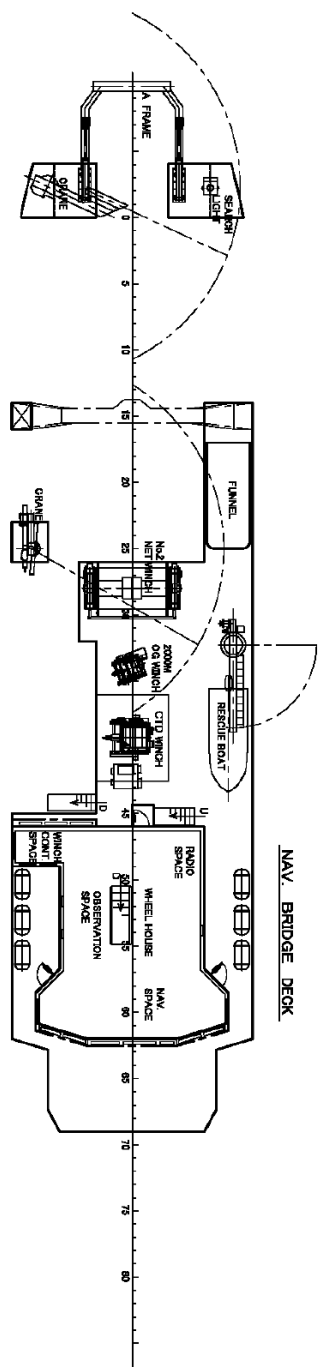


UPPER DECK



SUPER STRUCTURE DECK

(3) プラン B



MAIN DIMENSIONS

LENGTH O.A.	49.99 m
LENGTH P.P.	45.00 m
BREADTH	10.40 m
DEPTH to S.S.T.D.	8.30 m
DEPTH to U.P.P.D.	3.80 m
D.F.L.D.	3.70 m
COMPLEMENT	35 PERSONS

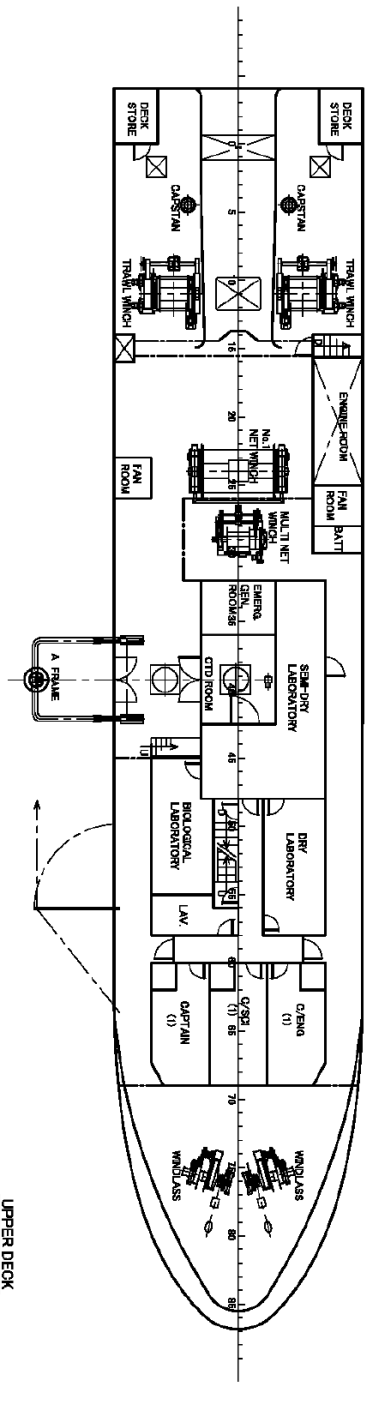
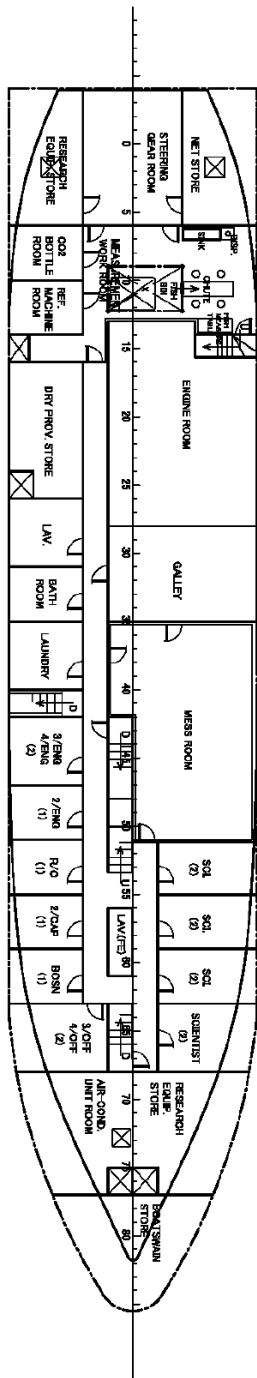
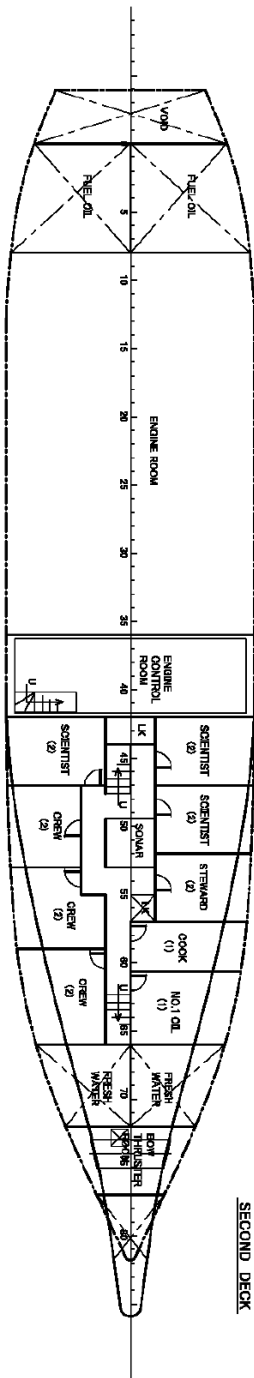
COMPASS DECK

NAV. BRIDGE DECK

SUPER STRUCTURE DECK

UPPER DECK

SECOND DECK

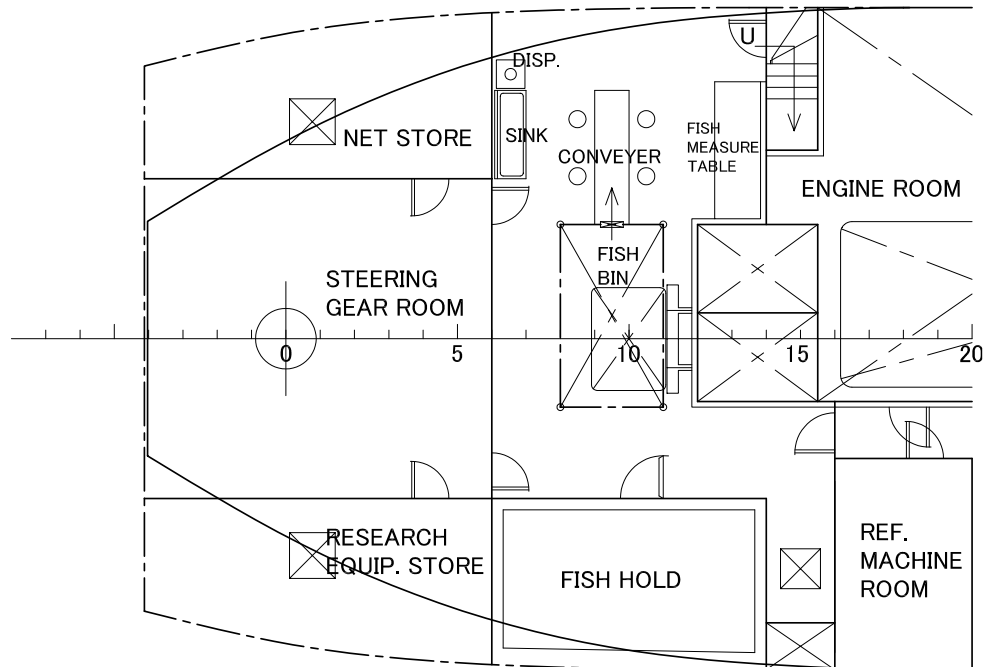


(4) 漁獲物処理室

①プラン A

MEASUREMENT WORK ROOM (Detail)

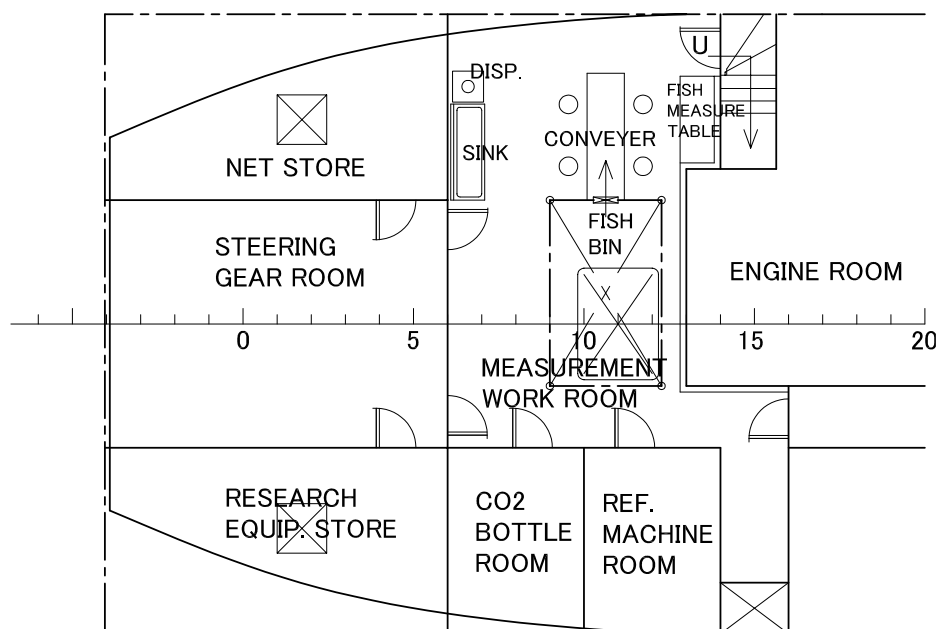
UPPER DECK



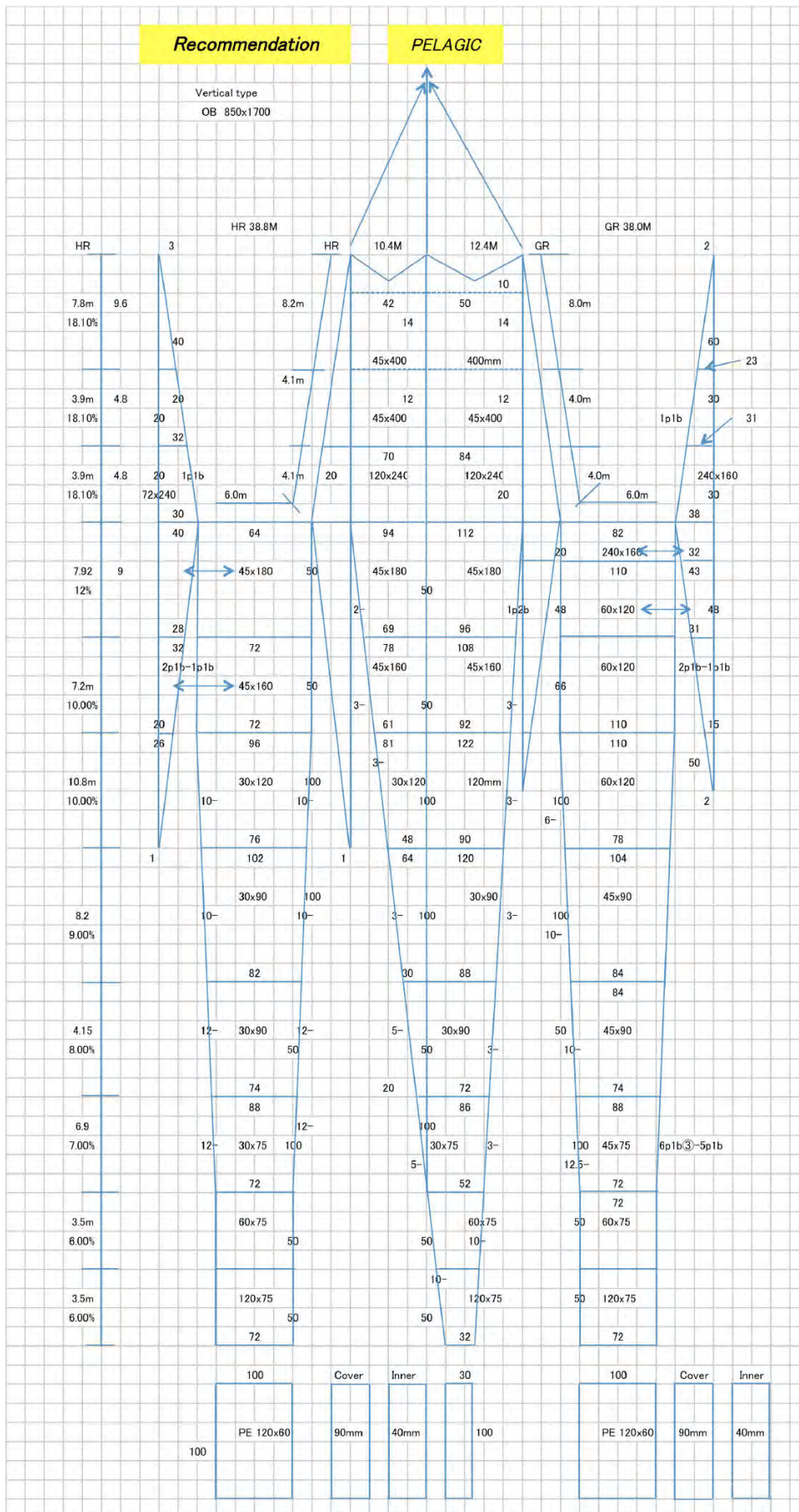
②プラン B

MEASUREMENT WORK ROOM (Detail)

UPPER DECK



Pelagic Trawl



4-2. 基本仕様比較表

1/7

Ship Name	AL AMIR MOULAY ABDALLAH	CHARIF AL IDRISSE	Projected Vessel (Plan-A)	Projected Vessel (Plan-B)	YOKO MARU
Type	Single Decker with long F'cisle	Single Decker with long F'cisle	Double Decker with F'cisle	Double Decker with Deck house	Double Decker with F'cisle
Type of Ship	Fisheries Research Vessel	Fisheries Research Vessel	Fisheries Research Vessel	Fisheries Research Vessel	Fisheries Research Vessel
Shipyards	SUMITOMO H.I.	NAGASAKI SHIPYARD	-----	-----	NIIGATA S&R
Delivered	Jan. 15, 2001	Jun. 18, 1986	-----	-----	Nov. 30, 2010
Port of Registry	AGADIR	CASABLANCA	-----	-----	NAGASAKI / JAPAN
Gross Tonnage	293	397	abt. 1,100	abt. 800	991
Navigation Area	Ocean Going International Voyage	Ocean Going International Voyage	Ocean Going International Voyage	Ocean Going International Voyage	Great Coasting International Voyage
GMDSS	A1+A2+A3	A1+A2+A3	A1+A2+A3	A1+A2+A3	A1+A2+A3
Class	NK / LR	NK / LR	NK / LR	NK / LR	JG
L(overall)	38.50	41.00	abt. 60.40	abt. 49.99	58.60
L(between pp)	33.50	35.00	54.00	45.00	52.30
Breadth	7.80	8.80	11.60	10.40	11.00
Depth(upper)	-----	-----	7.00	6.30	6.85
Depth(lower)	3.50	3.92	4.50	3.80	4.50
Designed Draft	3.00	3.20	4.40	3.70	4.40
Fishing for Research	Trawl(pelagic) Long line	Trawl (bottom)	Trawl (bottom and pelagic)	Trawl (bottom and pelagic)	Trawl (bottom and pelagic)
Complement	Crew 14	Crew 16	Crew 20	Crew 20	Crew 22
	Scient. 7	Scient. 9	Scient. 15	Scient. 11	Scient. 9
			Others 5	Others 0	Others 2
	Total 21	Total 25	Total 40	Total 31	Total 33
$V_{\text{trial}} / V_{\text{service}}$ (kts)	13.18/ abt. 12.2	12.47/ abt. 10.9	14.0 / abt. 13.0	13.5 / abt. 12.5	14.61 / abt. 13.0
Survey Speed (kts)	abt. 10		abt. 10	abt. 10	abt. 10
Fuel Oil(m ³)	90.77	111.27	250.00	210.00	232.97
Fresh Water(m ³)	18.47	53.52	80.00	40.00	106.38
Fish Hold(m ³)	16.21(-20°C)	24.05	12.00(-20°C)	Nil	Nil
O&M Fish Samples	-----	-----	28.0	26.0	32.0
Biological Labo.	7.8	10.4	22.0	11.5	22.0
Dry Laboratory	7.8	-----	12.0	12.0	12.0
Semi-dry Labo.	-----	-----	29.0	23.0	29.0
Accoustic Labo.	9.7	9.8	6.0	5.0	6.0
Total(m ²)	25.3	20.2	97.0	77.5	101.0
Windlass	2CD-2WE×1 24.5kN×12m/min	2CD-2WE×1 29.4kN×9m/min	1CD-2HD-1WE×2 44.1kN×12m/min	1CD-1HD-1WE×2 25.5kN×12m/min	1CD-2HD-1WE×2 44.1kN×12m/min
Capstan / Mooring Winch	Capstan×2 14.7kN×20m/min	Capstan×2 14.7kN×20m/min	1HD-1WE×2 29.4kN×15m/min	Capstan×2 19.6kN×20m/min	1HD-1WE×2 29.4kN×15m/min
Rudder	K7 Flap rudder	Kort nozzle rudder	Schilling rudder	Flap rudder	Schilling rudder
Steering Gear	24.7kN-m, 2.2kW 35°(P)+35°(S)	72.5kN-m, 3.7kW 35°(P)+35°(S)	149.5kN-m, 7.5kW 70°(P)+70°(S)	58.8kN-m, 3.7kW 45°(P)+45°(S)	149.5kN-m, 7.5kW 70°(P)+70°(S)

注) 1. 計画船のプラン A 及びプラン B を除き、新造時の要目を示す。

2. 計画船のプラン A 及びプラン B に記述のメーカー及び型式は参考メーカー、型式を示す。

Ship Name	AL AMIR MOULAY ABDALLAH	CHARIF AL IDRISSI	Projected Vessel (Plan-A)	Projected Vessel (Plan-B)	YOKO MARU
Warp Winch	34.3/17.6kN× 80/160m/min×2 20mmΦ×2,000m	44.1kN× 80/min×2 22mmΦ×3,000m	85/59/36kN× 55/80/130m/min×2 18mmΦ×5,000m	85/59/36kN× 55/80/130m/min×2 18mmΦ×5,000m	85/59/36kN× 55/80/130m/min×2 22mmΦ×2,500m
Net Winch	34.3kN×45m/min 1 drum, 5m ³	29.4kN×30m/min 1 drum, 2sets	Bottom × 1 Pelagic × 1	Bottom × 1 Pelagic × 1	29.4/19.6kN× 40/60m/min×1 2 drums, 8m ³ + 8m ³
Line/Net hauler	4.9kN×80m/min×1	-----	-----	-----	-----
Deck Crane	157kN-m× 1 cargo w. 19.6kN (telescopic type)	102kN-m× 1 cargo w. 19.6kN (folding type)	24.5/20.0kN × 11.5/14.1m × 1 (folding & telescopic)	24.5/20.0kN × 11.5/14.1m × 1 (folding & telescopic)	24.5/20.0kN × 11.5/14.1m × 1 (folding & telescopic)
Fore Crane (general use)	-----	-----	8.82/3.92kN × 7.5/11.0m × 1 (telescopic type)	-----	8.82/3.92kN × 7.5/11.0m × 1 (telescopic type)
Mid Space Crane (fishing operation)	-----	-----	8.82/14.7kN × 9.0/6.4m × 1 (folding & telescopic)	8.82/14.7kN × 9.0/6.4m × 1 (folding & telescopic)	8.82/14.7kN × 9.0/6.4m × 1 (folding & telescopic)
Research Winches	-----	-----	-----	-----	2,000m Armored W. 3.92kN×67m/min 6.4Φ×2,000m
	500m Hydrog. W. 7.8kN×50m/min 6.0Φ(SUS)×500m	Electric motor winch 1.96kN×114m/min	2,000m Hydrog W. 5.9kN×60m/min 5Φ(SUS)×2,000m	2,000m Hydrog W. 5.9kN×60m/min 5Φ(SUS)×2,000m	3,000m Hydrog W. 4.9kN×67.5m/min 5Φ(SUS)×3,000m
	-----	-----	-----	-----	5,000m Hydrog W. 49kN×79.5m/min 12Φ×5,000m
	CTD W. 7.8kN×50m/min 6.4Φ×500m (armored cable)	-----	2,000m CTD W. 7.84kN×60m/min 6.4Φ×2,000m (armored)	2,000m CTD W. 7.84kN×60m/min 6.4Φ×2,000m (armored)	7,000m CTD W. 22kN×60/120m/min 8.03Φ×7,000m (armored)
	-----	-----	Multi Net W. 25.5kN×60m/min 10.52Φ×2,000m (armored)	Multi Net W. 25.5kN×60m/min 10.52Φ×2,000m (armored)	MOCNESS Net W. 53.9kN×59m/min 10.52Φ×2,500m (armored)
A Frame (aft)	-----	-----	SWL 53.9kN outreach 3.0m	SWL 53.9kN outreach 3.0m	SWL 53.9kN outreach 3.0m
A Frame (midship)	SWL 5.9kN outreach 1.7m	-----	SWL 29.4kN outreach 3.0m	SWL 29.4kN outreach 3.0m	SWL 29.4kN outreach 3.0m
Hyd. Oil Pump	driven by main engine 215L/min×2	driven by main engine 162L/min×1	electro-hydraulic 37kW for windlass and fore crane	electro-hydraulic 22kW for windlass	electro-hydraulic 37kW for windlass and fore crane
	electro-hydraulic 57L/min×1, 37kW	electro-hydraulic 31L/min×1, 5.5kW	electro-hydraulic 90kW for warp/net winch, etc.	electro-hydraulic 90kW for warp/net winch, etc.	electro-hydraulic 90kW for warp/net winch, etc.
	electro-hydraulic 70L/min×1, 11kW	-----	electro-hydraulic 22kW for control	electro-hydraulic 22kW for control	electro-hydraulic 22kW for control
	-----	-----	electro-hydraulic 55kW for mooring winch, cranes, etc.	electro-hydraulic 45kW for capstan, cranes, etc.	electro-hydraulic 55kW for mooring winch, cranes, etc.
Air Condition Unit	compressor 11kW fan 3.7kW, 1 set	compressor 11kW fan 3.7kW, 2 sets	5 sets for 5 zones	5 sets for 5 zones	5 sets for 5 zones
Bow Anchor / Chain Cable	stockless 480kg / 19Φ×275m	stockless 685kg / 22Φ×302.5m	stockless 965kg / 32Φ×275m	stockless 675kg / 26Φ×275m	stockless 965kg / 32Φ×275m
Anti-Rolling Tank	-----	-----	Semi-active	-----	Semi-active

Ship Name	AL AMIR MOULAY ABDALLAH	CHARIF AL IDRISSI	Projected Vessel (Plan-A)	Projected Vessel (Plan-B)	YOKO MARU
Main Engine	YANMAR 6N21A-UN 736kW(1,000PS) × 800/287min ⁻¹ ×1	NIIGATA 6MG-22LX 809kW(1,100PS) × 900/329min ⁻¹ ×1	1,838kW(2,500PS) × 750/262min ⁻¹ ×1	1,471kW(2,000PS) × 750/285min ⁻¹ ×1	NIIGATA 6MG28HX 1,838kW(2,500PS) × 750/262min ⁻¹ ×1
Propeller	4CPP×1 D=2,100mm	4CPP×1 D=1,850mm	4CPP & PBCF×1 2,700φ	4CPP & PBCF×1 2,550φ	4CPP & PBCF×1 2,700φ
Generator Engine	YANMAR 6HAL2-N×2 115kW×1,500min ⁻¹	NIIGATA 6NSAK-G×2 147kW×1,500min ⁻¹	2 sets 441kW×1,200min ⁻¹	2 sets 245kW×1,200min ⁻¹	NIIGATA 6NSD-G×2 441kW×1,200min ⁻¹
Generator	AC385V, 50Hz 125kVA × 2	AC385V, 50Hz 160kVA × 2	AC385V, 50Hz 500kVA × 2	AC385V, 50Hz 275kVA × 2	AC450V, 60Hz 500kVA × 2
Harbour Use Generator	-----	-----	200kW×1,500min ⁻¹ AC385 250kVA×1	-----	-----
Emergency Generator set	-----	-----	AC385V 50kVA × 1 50kW×1500min ⁻¹	AC385V 50kVA × 1 50kW×1500min ⁻¹	AC450V 50kVA × 1 50kW×1800min ⁻¹
Fresh water Generator	4t/day (distilling)	1.5t/day (distilling)	10t/day(distilling) 5t/day(reverse)	5t/day(distilling) 5t/day(reverse)	10t/day(distilling) 5t/day(reverse)
Bowthruster	-----	4FPP×500Φ T=7.84kN(Hyd. oil)	4CPP×1,250Φ T=39.2kN(Hyd. oil)	4CPP×1,100Φ T=29.4kN(Hyd. oil)	4CPP×1,250Φ T=39.2kN(Hyd. oil)
Shore Connection Box	AC220V, 3-phase, 50Hz, 60A	AC385V, 3-phase, 50Hz, 60A	AC220V, 3-phase, 50Hz, 120A	AC220V, 3-phase, 50Hz, 120A	AC440V, 3-phase, 60Hz, 300A
Magnetic Compass	Desk mount type × 1 Portable type × 1	Stand type × 1 Table type × 1	Reflector type × 1	Reflector type × 1	Reflector type × 1
Auto Pilot	TOKIMEC PR-2022-SL-025S	TOKYO KEIKI GYLOT-101	ST Mode 1. Automatic, 2. Manual, 3. Lever, 4. Remote, 5. Joystic	ST Mode 1. Automatic, 2. Manual, 3. Lever, 4. Remote, 5. Joystic	YOKOKAWA PT500A-N2
Gyro Compass	TOKIMEC 1-Master 2-Repeaters	TOKYO KEIKI 1-Master 3-Repeaters	IMO approved type 1-Master, 7-Repeaters	IMO approved type 1-Master, 7-Repeaters	YOKOKAWA 1-Master, 7-Repeaters
Joystic Control System	-----	-----	Rudder, CPP, Bowthruster control	Rudder, CPP, Bowthruster control	Rudder, CPP, Bowthruster control
NO.1 Marine Radar	FURUNO X band, 25kW, 96n.m. with ARPA	FURUNO 25kW, 127n.m.	X band, 25kW, 96 n.mile with ARPA	X band, 25kW, 96 n.mile with ARPA	FURUNO X band, 25kW, 96 n.mile with ARPA
NO.2 Marine Radar	FURUNO X band, 6kW, 48n.m.	FURUNO 25kW, 100n.m.	SAME AS ABOVE	SAME AS ABOVE	SAME AS ABOVE
GPS Compass	-----	-----	LCD with DGPS function	LCD with DGPS function	FURUNO SC-110, 1set with DGPS function
Radio Direction Finder	FURUNO FD-160	TAIYO TD-A202B	-----	-----	-----
ECDIS (Chart Plotter)	Sodena, Turbo 2000 Chart plotter	-----	Color LCD, Position Calculation, Nav. Plan./Record.	Color LCD, Position Calculation, Nav. Plan./Record.	FURUNO FEA-2107 Color LCD
GPS Navigator	FURUNO GP-500MkII×1 GP-280×1	FURUNO FSN-80	2 sets LCD with DGPS function	2 sets LCD with DGPS function	FURUNO GP-150, 2 sets with DGPS function
Echo Sounder	FURUNO FE-1282	FURUNO FE-824	IMO approved type Range : 400m	IMO approved type Range : 400m	FURUNO FE-700
Doppler Log	FURUNO DS-70	JRC JLN-202	Speed range ; -10.0 to 40.0 kn	Speed range ; -10.0 to 40.0 kn	FURUNO -10.0 to 40.0 kn
Weather Facsimile Receiver	FURUNO FAX-210	FURUNO FAX-14311	Auto channel select. Thermal printing	Auto channel select. Thermal printing	JRC, JAX-91 Thermal printing
MF/HF Radio Telephone	FURUNO 250W, with DSC	JRC, SSB Radio Tel 400W, 1.6-25MHz	IMO approved type with DSC/NBDP	IMO approved type with DSC/NBDP	JRC, JSS-296 with DSC/NBDP
INMARSAT-C	FURUNO FELC.12 with EGC	JRC, Inmarsat-A JUE-35B	For duplicate equip. with EGC	For duplicate equip. with EGC	JRC, JUE-85 with EGC

Ship Name	AL AMIR MOULAY ABDALLAH	CHARIF AL IDRISSI	Projected Vessel (Plan-A)	Projected Vessel (Plan-B)	YOKO MARU
VHF Radio Telephone	FURUNO, 2 sets 25W, 57C with DSC	JRC, 1 set JHV-229, 12ch	2 sets 25W, 57C with DSC	2 sets 25W, 57C with DSC	JRC, 2 sets 25W, 57C with DSC
Inmarsat Fleet Broadband	-----	-----	for Tel, Fax & Data	for Tel, Fax & Data	JRC JUE-500 for Tel, Fax & Data
V-Sat	-----	-----	Ku-band VSAT Internet & e-mail	Ku-band VSAT Internet & e-mail	-----
AIS	-----	-----	IMO Approved Type	IMO Approved Type	FURUNO, FA-150 IMO approved type
Ship LAN System	-----	-----	IPv4 & 5e standards Info. & Data servers, PCs&Printer, UPS,	IPv4 & 5e standards Info. & Data servers, PCs&Printer, UPS,	M. H. I. Info. & Data servers, PCs&Printer, UPS,
Spare Parts Management System	-----	-----	1 set of PC Display&Print of Stock	1 set of PC Display&Print of Stock	JRCS Display&Print of Stock
Bottom Trawl Net	-----	* 2 sets for Fishes * 2 sets for Shrimp	* 2 sets for Fishes * 2 sets for Cephalopods * 2 sets for Shrimp/Hake	* 2 sets for Fishes * 2 sets for Cephalopods * 2 sets for Shrimp/Hake	NICHIMO 1 set
Otter Board for bottom trawl	-----	2 pairs	1 pair for Fishes and Cephalopods 1 pair for Shrimp/Hake	1 pair for Fishes and Cephalopods 1 pair for Shrimp/Hake	Single Type 1 pair
Pelagic Trawl Net	Taito Seiko 1 set	2 sets for Fishes	2 sets for Fishes	2 sets for Fishes	NICHIMO 1 set
Otter Board for pelagic	1 set	2 pairs	1 pair	1 pair	Double Plate(Al) 1 pair
Auto Tension Winch System	-----	-----	Same System as YOKO MARU	Same System as YOKO MARU	NICHIMO/SONIC Auto Tension Winch System
Scanbas System	SCANMER CGM-05	-----	SCANMAR depth/temp, distance trawl speed, trawleye	SCANMAR depth/temp, distance trawl speed, trawleye	SCANMAR depth/temp, distance trawl speed, trawleye
CTD System	Sea Bird SBE 911plus CTD 1) Under water unit SBE9plus*1 a) Option Sensor • Altimeter • DO sensor b) Carousel Water Sampler(SBE-32) c) Sample Bottle 2.5liters*12 2) Deck Unit SBE11plus*1 3) Software	-----	Sea Bird SBE 911plus CTD 1) Under water unit SBE9plus*1 a) Option Sensor • Fluorometer b) Carousel Water Sampler(SBE-32) c) Sample Bottle Rosette 5liters*24 2) Deck Unit SBE11plus*1 3) Software Seasoft [®]	Sea Bird SBE 911plus CTD 1) Under water unit SBE9plus*1 a) Option Sensor • Fluorometer b) Carousel Water Sampler(SBE-32) c) Sample Bottle Rosette 5liters*24 2) Deck Unit SBE11plus*1 3) Software Seasoft [®]	Sea Bird SBE 911plus CTD 1) Under water unit SBE9plus*1 a) Option Sensor • Altimeter(PSA -916D) • DO sensor(SBE43) • Fluorometer (ECO-FL) • Sediment(OBS-3) b) Carousel Water Sampler(SBE-32) c) Sample Bottle Niskin 10liters*12 2) Deck Unit SBE11plus*1 3) Software Seasoft [®]
Alkalinity & Dissolved Inorganic Carbon Extraction	-----	-----	MARIANDA VINDTA 3C	MARIANDA VINDTA 3C	-----

Ship Name	AL AMIR MOULAY ABDALLAH	CHARIF AL IDRISSI	Projected Vessel (Plan-A)	Projected Vessel (Plan-B)	YOKO MARU
OPCS (Optical Particle Counting and Sizing System)	-----	-----	CUFES Continuous Underway Fish Egg Sampler	CUFES Continuous Underway Fish Egg Sampler	Sea-Bird SBE-45 MicroTSG ·Fluorometer (WET-STAR) ·Deck sensor ·Precision thermometer(SBE-38)
Thermometer Salinometer	Digital thermometer	Bathy thermograph Induct. salinometer	Thermosalinometer	Thermosalinometer	TSURUMI XBT/XCTD SYSTEM
Net Sampling System	Plankton net (Ocean Ins.) 0.333/0.145mm mesh with flow meter /depressor	-----	Hydro-Bios MultiNet Type Midi Net opening 0.25m ² 5 net bags with zippers, 150µ mesh both Vertical and Horizontal Collection	Hydro-Bios MultiNet Type Midi Net opening 0.25m ² 5 net bags with zippers, 150µ mesh both Vertical and Horizontal Collection	MOCNESS(BESS) ·1 & 4m ² Net system 1m ² (150µ mesh)×9 4m ² (800µ mesh)×5 ·1m ² Net system 1m ² (150µ mesh)×9
VMPS	-----	-----	-----	-----	TSURUMI Vertical Multiple-opening Plankton Sampler
ADCP (Acoustic Doppler Current Profiler) Vessel Mount Type	ADCP Sunwest SW2000-115 115kHz Water depth 500m Max.128 layer	-----	ADCP T. RD Instruments Ocean Surveyor 150kHz Water depth 375-400m	ADCP T. RD Instruments Ocean Surveyor 150kHz Water depth 375-400m	ADCP T. RD Instruments Ocean Surveyor 38kHz, 150kHz Water depth 300-1,000m Max. 128 layer
LADCP (Lowered ADCP)	-----	-----	T. RD Instruments beam angle 20 deg 4 beams, 64MB M.	T. RD Instruments beam angle 20 deg 4 beams, 64MB M.	-----
Doppler Current Meter	AANDERAA, 3 sets RCM-9 2,000m	TSURUMI MTCM-4	SEAGUARD, 4 sets RCM, 2,000m Option sensor 1) Temperature 2) Conductivity 3) Pressure 4) Turbidity 5) DO	SEAGUARD, 4 sets RCM, 2,000m Option sensor 1) Temperature 2) Conductivity 3) Pressure 4) Turbidity 5) DO	-----
Weather Station	-----	-----	NIPPON ELE. INST. Automatic Weather Observation Station	NIPPON ELE. INST. Automatic Weather Observation Station	NIPPON ELE. INST. Automatic Weather Observation Station
Gyrocompass and Motion sensor	-----	-----	KONGSBERG Seapath 300	KONGSBERG Seapath 300	OCTANS(IXSEA)
Scientific Fish Finder	SIMRAD EK60 38kHz split beam 120kHz split beam	SIMRAD Scientific Sounder System	SIMRAD EK60 18kHz split beam 38kHz split beam 120kHz split beam 200kHz split beam	SIMRAD EK60 18kHz split beam 38kHz split beam 120kHz split beam 200kHz split beam	SIMRAD EK60 18kHz split beam 38kHz split beam 70kHz split beam 120kHz split beam
Scientific Multibeam Sonar	-----	-----	SIMRAD ME70 45 split beam 70-120kHz	SIMRAD ME70 45 split beam 70-120kHz	SIMRAD ME70 45 split beam 70-120kHz
Multibeam echo sounder (seabed mapping)	-----	-----	SIMRAD EM710 70-100kHz Depth 1,500m	SIMRAD EM710 70-100kHz Depth 1,500m	-----
Fish Finding Sonar	FRUNO CSH-53 1-15°CRT 1-Transceiver 1-TDR(50kHz) Range 75-2,000m	FURUNO CH-12 Range 50-1,500m	FURUNO FSV-35 1-CRT 1-Transceiver 1-TDR(24kHz) Range 60-5,000m	FURUNO FSV-35 1-CRT 1-Transceiver 1-TDR(24kHz) Range 60-5,000m	SIMRAD SX90 1-CRT 1-Transceiver 1-TDR(26kHz) Range 50-4,500m

Ship Name	AL AMIR MOULAY ABDALLAH	CHARIF AL IDRISI	Projected Vessel (Plan-A)	Projected Vessel (Plan-B)	YOKO MARU
Synchronous Transmitter	-----	-----	SIMRAD SU16 ADCP, EK60, ME70, EM710, FSV-35	SIMRAD SU16 ADCP, EK60, ME70, EM710, FSV-35	SIMRAD SU16 ADCP, EK60, ME70, SX90
Fish Finder	FURUNO FCV-1500 1-Display unit 1-Transceiver 2-TDR(28/68kHz)	-----	-----	-----	Furuno FCV-1500L 1-Display unit 1-Transceiver 2-TDR(28/88kHz)
Tide Meter	-----	-----	SEAGUARD WLR, 4647C-300m	SEAGUARD WLR, 4647C-300m	-----
Particle Analysis and Imaging	-----	-----	FlowCAM	FlowCAM	FlowCAM
Particle Size Analyzer	-----	-----	Micromeritics SediGraph 5120 Spec 0.1-300µm option 300-2,000µm	Micromeritics SediGraph 5120 Spec 0.1-300µm option 300-2,000µm	-----
Fast Repetition Rate Fluorometer	Turner Designs 10AU Field Fluorometer	-----	Turner Designs 10AU Field Fluorometer	Turner Designs 10AU Field Fluorometer	KIMOTO DF-03
FluoroProbe	-----	-----	-----	-----	BBE FluoroProbe
pH Meter	-----	Portable Type	Portable Type	Portable Type	-----
DO Meter	-----	Portable Type	-----	-----	-----
DO Field Recorder	-----	2 sets	-----	-----	-----
Multiple Corer	-----	Core sampler Gravity type 2 sets	4 transparent PVC tubes	4 transparent PVC tubes	RIGOSHA Core Tube×4 82×400
Bottom Grab	-----	Ekman-Berge type 2 sets	Van Veen Grab Sampler	Van Veen Grab Sampler	-----
Ultra-Pure Water Generator	-----	-----	Aquarius FRU414CA/CB 0.65L/min	Aquarius FRU464CA/CB 0.65L/min	MILLIPORE Direct-Q UV
Reverse osmosis water purifier	-----	-----	Aquarius RFP542HA 25L/h at 25°C	Aquarius RFP742HA 25L/h at 25°C	-----
Sediment Electric Grinder	-----	-----	1 set Precision Grinder	1 set Precision Grinder	not supplied by Shipbuilder
Onboard Sediment Sieving System	-----	-----	1 set	1 set	not supplied by Shipbuilder
Drying Oven	-----	-----	1 set 99ℓ, max. 250°C	1 set 99ℓ, max. 250°C	-----
Sample Storage Freezer	-----	-----	-25°C 365ℓ × 1	-25°C 365ℓ × 1	-20~-30°C 504ℓ × 3 -20~-35°C 540ℓ × 1
Deep Freezer	-45°C, 506ℓ	-----	-86°C, 35ℓ×1	-86°C, 35ℓ×1	-85°C, 86ℓ×1
Medical Refrigerator	-----	-----	100~200ℓ 2 point temp. alarm	100~200ℓ 2 point temp. alarm	+2°C~+14°C 177ℓ×1
Inverted Microscope	-----	-----	Leica DM IL LED 2 sets	Leica DM IL LED 2 sets	not supplied by Shipbuilder
Stereoscopic Microscope	Nikon SMZ645-3 with lamp house, Nikon α photo2 YS2-H with lamp house	OLYMPUS BHT-321, 2 sets	Nikon SMZ 1000, 2 sets Nikon camera benthos Ocular micrometer (10 mm/0,1mm) Monitor TV	Nikon SMZ 1000, 2 sets Nikon camera benthos Ocular micrometer (10 mm/0,1mm) Monitor TV	not supplied by Shipbuilder

Ship Name	AL AMIR MOULAY ABDALLAH	CHARIF AL IDRISSI	Projected Vessel (Plan-A)	Projected Vessel (Plan-B)	YOKO MARU
Ichtyometer	1 set 0-50cm	-----	2 sets	2 sets	not supplied by Shipbuilder
Marine Precision Scale	Max. 1,200g 1 set Max. 6,000g 1 set	-----	Max.800g, 2 sets precision 0.01g	Max.800g, 2 sets precision 0.01g	not supplied by Shipbuilder
Scale(big)	Max. 50kg 2 sets Max. 20kg 1 set.	-----	Max.60kg, 1 set precision 5g	Max.60kg, 1 set precision 5g	not supplied by Shipbuilder
Scale(small)	Max. 5kg 1 set	-----	Max.3kg, 2 sets precision 0.1g	Max.3kg, 2 sets precision 0.1g	not supplied by Shipbuilder