REPORT
ON
BASIC DESIGN
FOR
THE FISHERY TRAINING AND RESEARCH VESSEL
IN
THE REPUBLIC OF THE PHILIPPINES

NOVEMBER 1979

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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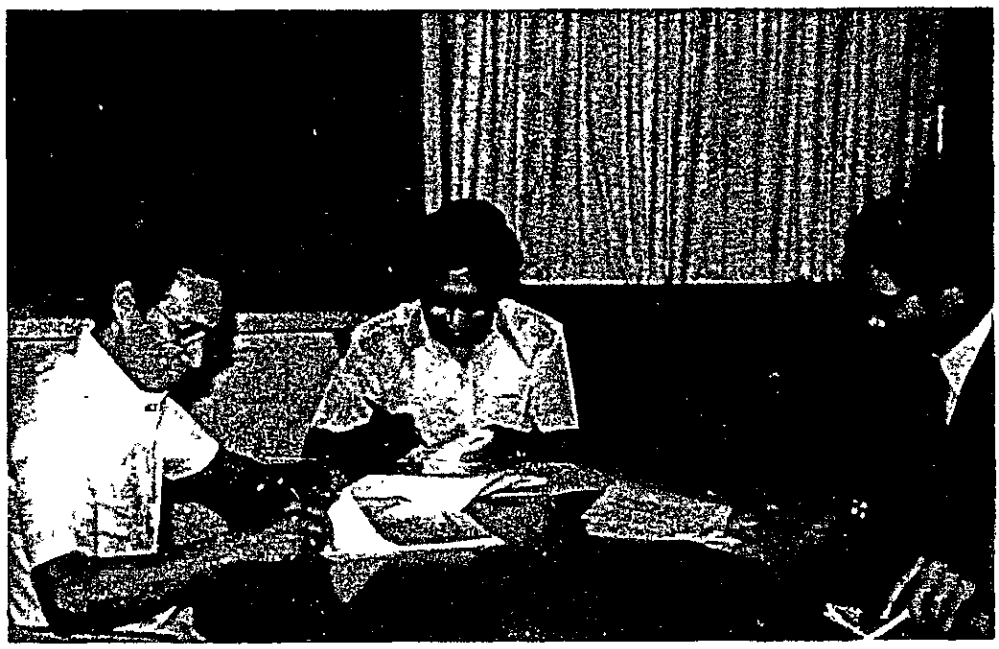
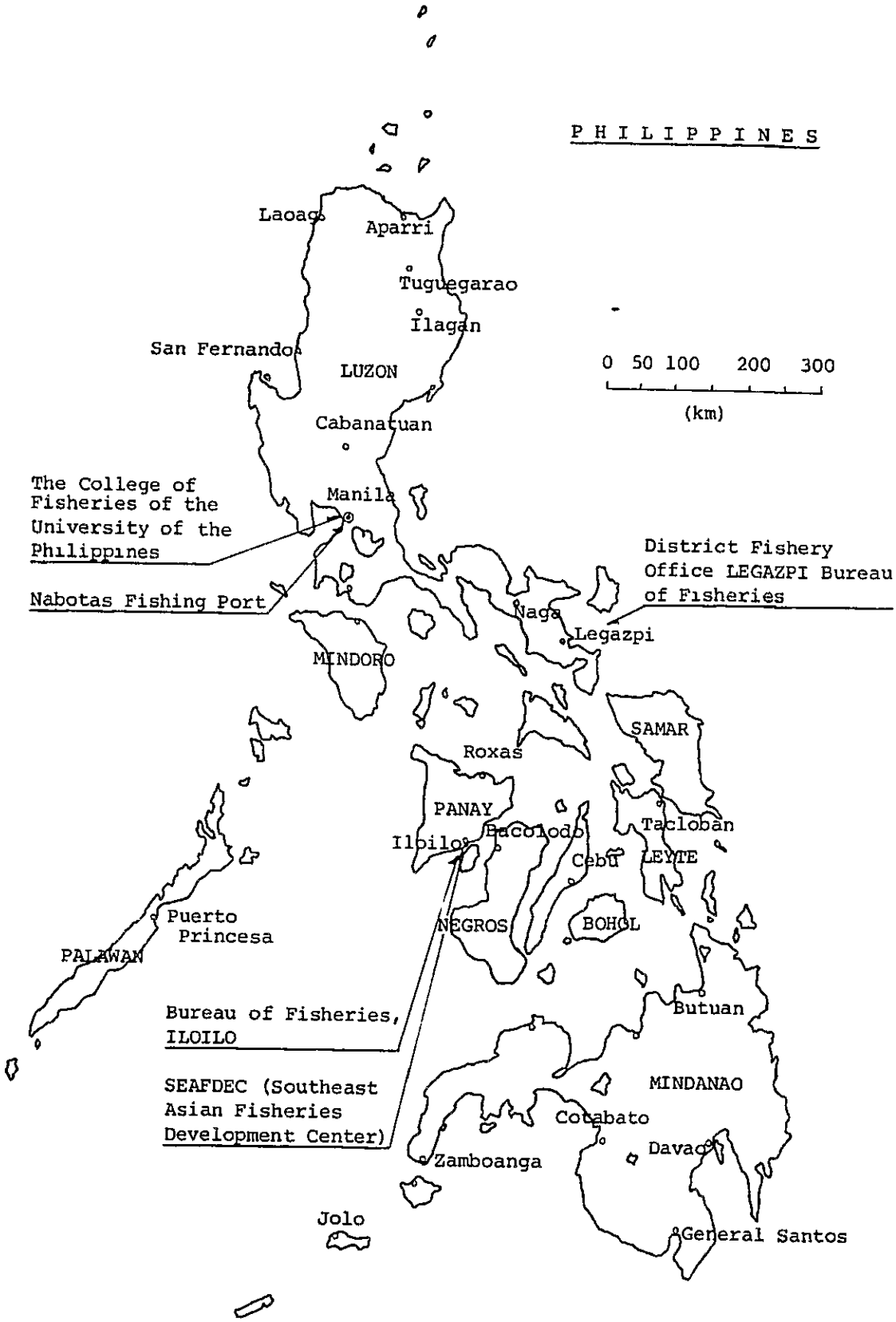


Signing Ceremony of Minutes


PHILIPPINES
Laoag
Aparri
Tuguegarao
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San Fernando
LUZON
0 50 100 200 300
(km)
Cabanatuan
The College of Fisheries of the University of the Philippines
Manila
District Fishery Office LEGAZPI Bureau of Fisheries
Nabotas Fishing Port
Naga
Legazpi
MINDORO
SAMAR
Roxas
PANAY
Tacloban
Iloilo
Bacolod
Cebu
LEYTE
Puerto Princesa
NEGROS
BOHOL
PALAWAN
Butuan
Bureau of Fisheries, ILOILO
MINDANAO
SEAFDEC (Southeast Asian Fisheries Development Center)
Cotabato
Davao
Zamboanga
Jolo
General Santos

PREFACE

The Government of the Republic of the Philippines requested the Government of Japan to extend a grant aid for furnishing a fishery training and research vessel for the purpose of developing fisheries in the waters off the coast of the country as well as of promoting the development research in the College of Fisheries of the University of the Philippines.

In response to this request of the Government of the Republic of the Philippines, the Government of Japan conducted a survey through the Japan International Cooperation Agency (JICA) for the basic design of fishery training and research vessel and equipment.

The JICA dispatched a 7-experts survey team for the basic design from 20 August to 9 September 1979 headed by Mr. Satoru Koakutsu, technical staff of the Japanese Ministry of Agriculture, Forestry and Fisheries. With the full cooperation of the Government of the Philippines and the University, the field survey was carried out smoothly. After further studies made in Japan, the present report has been formulated for presentation.

It is my sincere hope that this report will prove to be helpful to the development of the project and also contribute to the promotion of friendly relations between the Philippines and Japan.

I wish to express my gratitude to the officials concerned of the Government and the University of the Philippines for their whole-hearted cooperation and support extended to the survey team.

November, 1979

Shinsaku Hogen
President
Japan International
Cooperation Agency (JICA)

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I. BACKGROUND FOR MAKING SURVEY AND OUTLINE OF THE PROJECT

The Republic of the Philippines is a country comprising more than 7,000 islands of varying size, surrounded by 1,473,000 km^2 of territorial waters richly endowed with fisheries resources.

Nevertheless, trawl fishing is being carried out by private fishing boats in only half of its 240,000 km^2 of coastal fishing ground, while the import of fishery products is increasing yearly to meeting rising domestic demand.

In hoping to improve the fishing technology to develop and secure these rich fishing grounds and fisheries resources and particularly to expand and improve the College of Fisheries of the University of Philippines as a means of exploring deep sea fishing grounds, the Government of the Republic of the Philippines has requested Japan for the grant of a vessel for training and research purposes to said university.

In response to the above request, a survey was made of the existing situation and future schemes for fishery sector in the Republic of the Philippines, whereupon a basic design survey was conducted with a view to build a training and research vessel both technically and economically most suitable for its purpose.

II. OBJECTIVE OF SURVEY

This survey purports to conduct studies necessary for grasping the existing situation and mapping out future schemes as well as prepare the basic design report for building a training and research vessel to be granted to the College of Fisheries of the University of Philippines under Japanese Government's grant assistance in accordance with the request from the Government of the Republic of the Philippines.

III. ORGANIZATION OF SURVEY TEAM

The survey team was organized by the following members with Mr. Satoru Koakutsu, Techinical Official, International Affairs Division, Department of Marine Fisheries, Fishery Agency, Ministry of Agriculture, Foresty and Fishery of Japan, as Team Leader.

Name	Assigned Duties	Incumbent Position
Satoru KOAKUTSU	Team Leader	Technical Official, International Affairs Division, Department of Marine Fishries, Fishery Agency, Ministry of Agriculture, Forestry and Fishery
Shigeru ODATE	Fishery Resources	Technical Official, Research Division, Fishery Agency, Ministry of Agriculture, Forestry and Fishery
Yoichi SEKI	Coordination	Staff Member of the Social Development Cooperation Department, Japan International Cooperation Agency (JICA)
Teiichi HIGASHI	Hull Design	Hull Design Consultant, Overseas Agro-Fisheries Consultants, Co., Ltd.
Yoichiro HIDA	Engine & Electric Equipment	Engine and Electric Equipment Consultant, Overseas Agro-Fisheries Consultants, Co., Ltd.
Yoshibumi KIHARA	Fishing & Fishing Gear	Fishery Consultant, Overseas Agro-Fisheries Consultants, Co., Ltd.
Yusei IWAMOTO	Hull Design & Fishery	Hull, Structure and Fishery Consultant, Overseas Agro-Fisheries Consultants, Co, Ltd.

IV. SURVEY SCHEDULE

Date	Place	Itinerary
1. Aug. 20 (Mon)	Tokyo - Manila	- Departure by JAL 743 - Arrangement of survey schedule, etc.
2. Aug. 21 (Tue)	Manila	- Adjustment of survey outline and itinerary with the Embassy of Japan and JICA - Courtesy call on the College of Fisheries, University of Philippines (hereinafter referred to as UP) and briefing on outline of survey - Inspection of research vessels at Nabotas fishing port
3. Aug. 22 (Wed)	Manila	- Hearing on the project outline from concerned members of the College of Fisheries, UP and review of contents - Courtesy call on Mr. Corpuz, Assistant Director-General, NEDA and brief explanation of survey
4. Aug. 23 (Thur)	Manila	- Hearing on the project outline from concerned members of the College of Fisheries, UP and review of the contents - Examination of the General Arrangements proposed by UP
5. Aug. 24 (Fri)	Manila	- Detailed discussion on hull design with members of UP - Conferrence with Mr. Nair, ADB (in charge of fisheries development) on overall matters of Philippine fisheries

	Date	Place	Itinerary
6.	Aug. 25 (Sat)	Manila	- Detailed discussion of studies made by UP on hull and equipment for research and survey and collection of data
7.	Aug. 26 (Sun)	Manila	- Compilation of discussion material and detailed review of Japan's proposal
8.	Aug. 27 (Mon)	Manila - Legazpi	- Hearing on fishery situation from the Legazpi District Fishery Office staff - Inspection of fishery-related facilities
9.	Aug. 28 (Tue)	Legazpi	- Inspection of Legazpi fishing port and related facilities - Collection of information and data
10.	Aug. 29 (Wed)	Legazpi - Cebu - Iloilo	- Hearing on fishery situation from officials of Iloilo Bureau of Fisheries and inspection of Iloilo fishing port and related facilities
11.	Aug. 30 (Thur)	Iloilo - Zamboanga - Manila	- Informal discussion and briefing from concerned personnel of UP, Iloilo and inspection of its research facilities - Hearing on the fishery situation from concerned personnel of SEAFDEC, inspection of its research facilities and collection of information and data
12.	Aug. 31 (Fri)	Manila	- Courtesy call on UP President, Dr. Soriano

	Date	Place	Itinerary
13.	Sept. 1 (Sat)	Manila	- Compilation and review of information and data, and survey of fishing port facilities within city
14.	Sept. 2 (Sun)	Manila	- Review of information and data, and survey of fishery-related facilities within city
15.	Sept. 3 (Mon)	Manila	- Detailed discussion on hull, outfitting and equipment with UP members concerned. Also, detailed discussion on fishing gear and research equipment
16.	Sept. 4 (Tue)	Manila	- Interim report of survey results to Embassy of Japan and JICA - Review of draft Minutes with UP staff - Survey of Nabotas fishing port
17.	Sept. 5 (Wed)	Manila	- Explanation of draft Minutes to Embassy of Japan and JICA
18.	Sept. 6 (Thur)	Manila	- Execution and exchange of the Minutes at NEDA - Report of the survey results to Embassy of Japan and JICA - Dinner party given by survey team
19.	Sept. 7 (Fri)	Manila	- Supplementary survey and collection of information and data
20.	Sept. 8 (Sat)	Manila	- Survey of related facilities at Nabotas fishing port
21.	Sept. 9 (Sun)	Manila - Tokyo	- Return to Narita by JAL 742

V. LIST OF PERSONS CONCERNED WITH THE SURVEY

V-1 The Philippines

Dr. SORIANO	President, University of Philippines (UP)
Dr. J.A CARREON	Associate Dean, College of Fisheries, UP
Dr. A.N MINES	Professor
Dr. E.D.C FLORES	Assistant Professor
Dr. J. SAEGER	German Expert (Consultant)
Mr. P. JARCHAU	German Expert (Consultant)
Mr. E.G. CORPUZ	Assistant Director General, National Economic Development Authority (NEDA)
Mrs. G.B GADUANG	District Fishery Office LEGAZPI Bureau of Fisheries
Mr. H. MAGJUCI	Regional Director, Bureau of Fisheries, ILOILO
Dr. V.A DUREZA	Assistant Professor, College of Fisheries, UP, ILOILO
Dr. R.D FORTES	Assistant Professor, College of Fisheries, UP, ILOILO
Dr. A.S CAMACHO	Associate Dean, College of ILOILO, UP
Mr. V.M Nair	Senior Fisheries Specialist, Asian Development Bank

V-2 Japan

Jiro NAKAJIMA	Secretary of the Embassy of Japan in the Philippines
Toshikazu MIURA	Manager of the Manila Office, JICA
Michio KANDA	Staff of the Manila Office, JICA
Noboru HOSHINO	Expert assigned to the South-east Asian Fisheries Development Center (SEAFDEC)
Shiro HARA	Expert assigned to SEAFDEC
Shigeru KUMAGAYA	Expert assigned to SEAFDEC
Hiroshi MOTOO	Expert assigned to SEAFDEC
Yoshitetsu NUKIYAMA	Expert assigned to SEAFDEC

VI. MINUTES

The following Minutes was signed by and between Dr. Jose A. Carreon, Associate Dean, College of Fisheries, University of Philippines and Mr. Satoru Koakutsu, Team Leader, Japanese Basic Design Survey Team in the presence of Mr. Edvardo G. Corpuz, Assistant Director General, National Economic Development Authority, the Government of the Republic of the Philippines on September 6, 1979.

MINUTES ON THE BASIC DESIGN STUDY OF THE
FISHERY TRAINING AND RESEARCH VESSEL
TO THE REPUBLIC OF THE PHILIPPINES

At the request of the Government of the Republic of the Philippines for the basic design study of the training and research vessel on the basis of grant assistance, the Government of Japan has sent through the Japan International Cooperation Agency (herein after referred to as "JICA") a survey team headed by Mr. Satoru Koakutsu to conduct a basic design study of the captioned vessel for 21 days from August 20, 1979.

The vessel is, after enthusiastic discussions between the survey team and the Philippine Authorities, decided as a 350-GT multi-purpose training and research ship equipped with fishing gears, relevant navigational, training and research apparatus and equipment, and will be granted by the Government of Japan to the College of Fisheries of the University of the Philippines through the Government of the Philippines.

The objective of the survey team is composed of the following two major components:

Firstly, to determine the final design of the proposed multi-purpose fishery training and research vessel.

Secondly, to contribute toward the fisheries development programme of the Government of the Philippines through the effective uses of the vessel.

The survey team has a series of discussions and exchanged views with the Government of the Philippines, the College of Fisheries of the

University of the Philippines and the authorities concerned for the objective of the survey team mentioned above.

As a result, both parties, the Philippine Authorities and the Japanese survey team, have agreed to recommend to their respective Government for taking necessary steps in order to accomplish this project as per details shown in the attached.

6th of September 1979

Manila, The Republic of
The Philippines

Satoru Koakutsu
Team Leader
The Japanese Survey Team

Jose A. Carreon
Associate Dean
College of Fisheries,
University of the Philippines

Eduardo G. Cortuz
Assistant Director General
National Economic Development Authority

THE BASIC DESIGN STUDY OF THE FISHERY TRAINING AND RESEARCH VESSEL TO THE GOVERNMENT OF THE PHILIPPINES

I -- GENERAL SITUATION

1. The Government of the Philippines submitted a request, through the Embassy of Japan, for grant assistance in form of a 350-GT multi-purpose training and research vessel in order to expand and improve the capabilities of the College of Fisheries, University of the Philippines, in marine fishery training and research, thus be able to contribute effectively to the training and research development in the fisheries program of the Government of the Philippines.

2. The objective of the Japanese survey team despatched by the JICA:

   a) to determine the final design of the proposed multi-purpose fishery and research vessel;

   b) to contribute toward the fisheries development programme of the Government of the Philippines through the effective uses of the vessel.

3. However after enthusiastic discussions were exchanged between the Japanese survey team and the Philippine Authorities concerned, the basic design of the fishery training and research vessel has been agreed to modify from the original proposal, intending to determine the most useful design for the purpose and also

effective for development of fisheries in the Philippine waters in future.

4. The vessel shall be built in Japan as well as the necessary machinery and equipment, under the grant basis of the Japanese Government and shall be used by the College of Fisheries, the University of the Philippines, under the attentative supervision for good maintenance.

II -- THE STEPS TO BE TAKEN BY THE JAPANESE GOVERNMENT

The Japanese Government will take necessary steps to provide such fishery training and research vessel to the Government of the Republic of the Philippines of which specification and equipment as listed in Annex A and general arrangement in Annex B.

III -- THE STEPS TO BE TAKEN BY THE GOVERNMENT OF THE REPUBLIC OF THE PHILIPPINES

a) To provide data, information as well as facilities necessary for accomplishing the objective of the Japanese survey team.

b) To supervise attentively and to keep good maintenance of the fishery training and research vessel, after delivery from the Government of Japan to the Government of the Philippines.

ANNEX A

1. PROPOSED TRAINING AND RESEARCH PROGRAMME

a. Training of students on the various aspects of modern fishing on board. Each training programme is for a 5-month period.

b. An extensive fishing survey of the major marine areas of the Philippines utilizing the following types of fishing gears:

1) Demersal trawl

a) Shallow water trawl

b) Deep sea trawl

2) Midwater trawl

3) Purse seine

c. Assessment of the present fishing resources in the Philippine traditional fishing grounds and potential stocks in newly exploited fishing grounds.

d. Biological studies of the major fish species caught.

e. Fifteen-day fishing explorations and hydrobiological studies will be conducted monthly.

2. SPECIFICATION OF MULTI-PURPOSE TRAINING AND RESEARCH VESSEL

L. O. A.	about	40.4 M
Breadth	about	8.4 M
Depth	about	4.4 M
G. T.	about	350 T
Complement		40 PSN

Sailing speed about 10 knots propelled by 1200 ps main diesel engine drive to CPP single screw propeller with Kort nozzle and bow thruster which these are remote controlled by wheel house.

The ship having full air conditioned accommodation except wet laboratory and galley, shall be equipped with as under:

1. Trawling facilities in bottom and mid-water as her main purpose of the operation and purse seining facilities as her sub purpose of which equipments as listed in other sheet.

2. Refrigeration system having capacity about 2 tons of fishes quick freezed to - 18°C per 1 cycle but 3 cycles per day by the semi air blast freezing, about 90 M^3 fish dry hold keeping temperature - 20°C, salt brine freezing hold about 10 M^3, refrigerant R-22.

3. Endurance

   4 days cruising, 11 days fishing

4. 2 sets of diesel generating set which have suitable capacity for her operation of trawling and purse seining, and also for equipment 30 KW fish attraction light and galley elect range.

5. Engine room auxiliary machineries; - purposes for S. W. F. W. L. O., air compressor and air reservor, bilge-oil separator, necessary piping system, air ventilation fans and steering gear.

6. Electrical equipments: - necessary arrangements respect to other installations

7. Dry and wet laboratory, 2 set of Oceanographic winches, survey and research equipment as listed in other sheet.

8. Anchoring and mooring equipment, mast and booms, on deck machineries: -

   1 Windlass 3 T - 22 M/min.

   1 Trawl & purse winch (5T + 5T) - 60 M/min.
   wire rope 18 Φ x 2000M on each drum.

1 Net drum winch 3T - 30 M/min.
drum capacity 2.5 or 3.0 M^3

2 Fishing winches 3T - 30 M/min.

2 Gilson winches 6T - 20 M/min.

1 power block 3T - 20 M/min.

1 Topping winch 2T - 20M/min.

2 Vang winches 1T - 20 M/min.

1 cargo winch 0.9T

1 Oceanographic winch with 500 M 6φ steel wire cable

1 Oceanographic winch with 2500 M 3φ steel wire cable.

9. Wheel house having good sight around shall be equipped with - installations as listed in other sheet.

10. Rubber boat, F.R. P Work boat, Skiff boat, davits for boat, purse davit and other necessary equipment are designed and arranged in suitable.

11. Rule and regulation: - The ship shall be designed and constructed in comply with J. G. maritime regulation and surveyed by J. G. maritime bureau for the export ship survey and the qualified certificate, and if required for the registration of Philippian flag the ship shall be comply with classification society A. B. or N. K.

SOLAS Regulation for life saving and IMCO requirement for the stability performance of her.

12. Tests and Trials

Maker's shop test and other builder's test, inclining experimental test, provisional and official sea trial, fishing gear trials these are carried out in accordance with rule and regulation or builder's manual.

13. Spare parts and gear or outfit and tools;
Spare parts by the maker's or builder's standard or required by rule and regulation for the legal one also same for outfits and tools.

All these main items and particulars which described above shall be subject to some amend and modifications because of technical difficulties, space and volume or budget limitation but shall be also respected to the requirements and the proposal from Philippine University within limited budget as far as possible.

3. LIST OF EQUIPMENT AND APPARATUS

(1) Wheelhouse Equipment:

Shaft rpm, engine rpm, exhaust temperature and monitoring system

1 Doppler speed log

2 Radar 60 m' range

1 Omega navigation system

1 Satelite navigation system (NNSS)

1 Automatic course recorder

1 Direction finder

1 Gyrocompass

1 Autopilot

1 SSB radiotelephone

1 VHF radiotelephone

1 Searchlight sonar

1 Scanning sonar

2 Vertical echosounder

1 net-recorder

1 net sonde (for purse seine)

2 Monitor recorders of echosounders (in dry laboratory)

(2) Fishing gear for 1,200 HP - Training/Research-Vessel:

a. <u>Bottom trawling equipment</u>

2 high-opening bottom trawls for soft bottom, lower wings and belly extra strong, complete with cod ends (40mm stretched meshsize)

2 sets of 8" net-floats extra strong for deep-water fishing, ready mounted to the headline (200 m depth)

2 sets of rubber disc groundropes, ready mounted to the footrope (300 MM Φ)

2 sets groundrope bridles of steel wire rope, lengthening bridles, pennant wire etc.

2 sets of oval curved steel otterboards (soft bottom)
Spare equipment

4 high-opening bottom trawls as above, without floats, rubber disc groundrope, compl. w. condends

Webbing in bales for the bottom trawls

400 kg of mending twine, assorted

400 kg of rubber disc for spare, assorted

200 mtr. of steel wire, 18 ø as backstrope, etc.

400 mtr. of steel wire, 16 ø as bridles

b. Pelagic trawling equipment

3 four seam midwater trawls with 800mm stretched meshes compl. with cod end 40mm stretched mesh, floats and chains

2 sets of bridles etc., compl. with kelly's eyes, stoppers, G-hooks, recessed links, snap hooks and swivels

2 sets of iron weights for the midwater trawls

1 pair of pelagic otterboards

2 cod ends compl.

Webbing in bales for the midwater trawls

200 kg of mending twine, assorted

400 mtr. steel wire, 16 ø as bridles

400 mtr. nylon rope, 22 ø as bullropes or lazy line (22 ø is minimum)

c. Fisheries accessories

2 x 2,000 mtrs. towing warps, 18 mm ø, marked

200 D-shackles each size-assorted

40 Bow shackles 1.1/4" steel

20 swivel chains 1" with g-hooks and links

40 swivels 1"

200 net floats 8" ø

150 netting needles assorted

20 marline spikes

200 nylon ropes for fixing floats etc. (12mm ø)

400 kg. of chain for trawl trimming

80 pcs. knives (pocket)

d. Purse seine

L = 350 FM = (640 meters) x depth 56 FM = (102 meters) knot less complete set and spare material for sardine and mackerel: 1 set

Ship's accessories:

1 set of Hand operated winch

1 set of portable megaphone

1 pair of walkie-talkie

1 pc. 25m steel tape

1 pc. 50m steel tape

1 set of 3 Kw diesel engine generator, portable 220V

5 sets of Sextant

Extra 30 sets of life vest

Television set and audio stereo set in saloon each 1 set

Safety helmet	70 pcs
Television set in mess room	1 set
Rubber rain coat	40 sets
Rubber boots	40 sets
Winter clothes	10 sets

4. SPECIFICATIONS OF OCEANOGRAPHIC AND BIOLOGICAL EQUIPMENTS on the Research Vessel

	Description	Uses	Quantity
A.	Sampler		
1.	Nansen Reversing water bottle	To collect water sample at different designed depth	8 pcs.
	Brass messenger	Spare	8 pcs.
2.	Reversing Thermometer	Measure temperature at different depth	
	1) Protected		12 pcs.
	2) Unprotected		4 pcs.
3.	Electric Bathythermograph	Measure temperature at different depth	2 sets
4.	Clinometer	Measure wire angle	
	Hand type		2 pcs.
5.	Ek-man Merz Current Meter	Measure current direction and velocity	1 set
6.	Secchi Disk	Measure turbidity	2 pcs.
7.	Ek-man Merz Bottom Sampler	Collect benthic specimen	1 set
8.	Niino's Dredge	Device to gather shellfish, etc., at sea bottom	1 set
	Light Dredge		1 set
9.	Testing Sieve (5mm-10mm)		1 set
10.	Clark Bumpers	Collect planktonic specimen	1 set
11.	Plankton Net (NORPAC)	"	3 pcs.
12.	Larval Net (130 cm)	"	3 pcs.
13.	Plankton Flow Meter	"	3 pcs.
14.	Thermograph	Automatic Recording of temperature	1 pc.
15.	Thermometer		
	1) 0° - $100^{\circ}C$	For measuring water temperature	5 pcs.
	2) 0° - $50^{\circ}C$	"	5 pcs.
	3) -35° - $0^{\circ}C$	For measuring frozen fish body temperature	5 pcs.

16.	Standard Seawater ColorSet	For determination of Sea color	2 sets
17.	Silver-Disk Pyrheliometer		1 pc.
18.	Aneroid Barograph	Recording of atmospheric pressure	1 pc.
19.	Refractometer (1 kw)	Measure light refraction factor of sea water	1 set
20.	Photometer	Measure intensity of light	1 set
21.	Thermometer Reader		3 pcs.

B. Data Analyzers

1.	Induction Salinometer	Measure salinity of sea water samples	1 set
2.	Ph Meter (Portable)	Measure Hydrogenion concentration	2 pcs.
3.	BOD Determination	Dissolved oxygen quantitative analysis	1 set
4.	Titration Apparatus	Quantitative analysis	1 set
5.	Magnetic Mixer	To stir chemical solutions	2 pcs.
6.	Piston Burret	For chemical titration of sea water	3 pcs.
7.	Automatic Burret (25 ml)	For bissoleve oxygen analysis	2 pcs.
8.	Manual Centrifuge	For plankton quantitative analysis	1 set
9.	High Speed Centrifuge with refrigeration	"	1 set
10.	Platform Balance (50 kgs. cap. 0.5 g sensitivity)	Measure weights of specimen	1 pc.
11.	Triple Beam Balance	Measure weights (wet laboratory)	3 pcs.
12.	Analytical Balance	Analytical measurement of chemical specimen	1 pc.
13.	Vernier Calipers (15-20 cms)	Measure thickness or diameter specimen	5 pcs.
14.	Hand Tally Counter	Measure counting of specimens	5 pcs.
15.	Dissecting Sets	For cutting or dissecting fish specimens	10 sets
16.	Scientific/Statistical Calculator (220 V/w AC adaptor)	Statistical analysis of data, standard deviations gears, etc.	2 pcs.
17.	Mini-printer Calculator	For computation of data	2 pcs.

18.	Sampling bottles and specimen holders		
	1) Testing Bottles for BOD Analysis, 100 ml cap.	Quantitative analysis	200 pcs.
	2) Salinity Bottles (250 ml cap.	"	200 pcs.
	3) Standard Sea Water	To measure chlorinity	100 pcs.
	4) Dissecting Pans	Dissecting accessories	
	370 x 320 x 50 mm		10 pcs.
	350 x 255 x 45 mm		10 pcs.
	310 x 240 x 40 mm		10 pcs.
	5) Forceps	Handling of biological specimen	10 pcs.
	6) Specimen Tong	"	
	300 mm long	"	5 pcs.
	400 mm long	"	5 pcs.
19.	Submarine Illuminator	For productivity measurement of waters in sea	1 set

C. Microscopes, Cameras and Projector

1.	Zoom Stereoscopic Microscope with accessories for photography	For planton and benthos analysis	2 sets
	Stage Micrometer	"	3 pcs.
	Microscopic Eyepiece 20X	"	1 pair
	Eyepiec Micro-meter disc	"	3 pcs.
	Glass Wabes	For microscope work	
	1) Microscope glass slides		1 gross
	2) Cell counter		2 pcs.
2.	35 mm camera with the following accessories; motor drive, 5o mm lens (F2), 200 mm lens, tripod, billows, universal stand, flood lamps, electronic flash.		1 set
	Camera and Accessory Aluminum Case (50 X 30 X 30 cm)		1 pc.
3.	Unuerwater 35 mm Camera with the following accessories; close-up less, underwater exposure meter, underwater photographic flash,	For underwater marine photography	1 set
4.	Slide Projector with the following accessories; straight and rotary magazines, bulb spare, screen, etc.	Teaching and training aid on board	1 set
5.	8 mm sound-movie camera	Demonstration, training and teaching aid on board	1 set
6.	8 mm sound-movie projector with 2-track recording and two spare bulbs	" "	1 set

D. Diving Equipments

1.	Wet Suit with accessories (Single tank block, Regulator, Harness, Face Mask, Lead Belt, Flipper, Depth Gauge, Marine knife, Life Jacket, Divers Watch, Underwater Flash Light, Glass Bottom Boxes, Booties and etc.)	Underwater observation and data gathering	2 sets
2.	Portable Diver's Air-Tank Compressor (2 cu. ft. at 3,700 p.s.i.)		1 set
3.	Inflatable Boat (4-6 persons) with outboard motor (12 HP)	Water crat to propell worker/ researcher during observation and data gathering	1 set
4.	Portable Generator (500W, AC 220Vm 4 strokes)	Power Source of aerators vacium pumps in shallow water operation on board the inflatable boat	1 set

B. Office Equipments

1.	Drafting Instruments (Rotring technical pen, Flexiglass triangle, and etc.. Leroy lettering set)	Drawing of plans and sketch of experimental procedures	2 sets
2.	Portable Cassette tape	Record of preliminary results and data	1 set
3.	Portable Typewriter	Typing of field reports	1 pc.
4.	Copier	Reproduction and copying of data on board the vessel	1 set
5.	Dividers		
	200 mm length	Sea Chart reading	2 pcs.
	Proportional divider		2 pcs.

Chapter 1.

Summary of Survey Findings

Chapter 1. Summary of Survey Findings

1-1 The Present Fishery Sector of the Republic of the Philippines

1-1-1 Present Status of Fishing Industry

The Republic of the Philippines, comprising more than 7,000 islands and possessing a long coastline, has an environment that is favorable for fishery. In addition, the potenciality of fisheries resources is abundant in its coastal area.

As a result, the Republic of the Philippines ranks high among the countries of the Asian region in fishery production. During the past 30 years, it has attained spectacular growth, having increased its fish catch sevenfolds. In 1976, it caught 1.4 million tons and in 1977, 1.51 million tons of fish.

The fishery sector of the nation can be broadly grouped into three categories. The first is the commercial fishing which has the largest operating scale and accounts for the largest proportion of the nation's fish catch. Its major fishing methods are the purse seine, bag net and otter trawl. The second is the small-scale coastal fishery performed within three miles from shore, in which numerous fishing boats are engaged. The third is the inland waters fishery and aquaculture -- particularly, fishing in the

lakes and marshes and milkfish (Bangos) culture in fishponds -- which account for the yearly catch of 110 thousand tons.

Types of fish caught are the families of horse mackerel, mackerel and sardine; families of bonito and tuna; families of sea bream, grouper and lizard-fish and families of shrimp and prawn. Horse mackerel is particularly abundant, accounting for 37% of the total fish catch.

1-1-2 Fishing Ports and Fish Markets

There are about 120 landing ports in the Philippines, of which 12 are the principal ones where 5,000 tons or more of fish are landed each year. The largest fishing port of the nation is the Nabotas fishing port in the suburbs of Manila, where about 200 thousand tons of fish are landed yearly. It is equipped with every shore facilities and is utilized by many large fishing vessels. Since 1978, the nation has launched on the construction and improvement of principal fishing ports by which five fishing ports will be built at Zamboanga, Iloilo, Camaligan, Lucena and Sual.

Along with the construction and improvement of these fishing ports, the installation and improvement of fish markets which had long been the bottleneck in supplying fishery products will also be promoted.

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Although fish markets are set up in principal local cities, fishery products are sold in a part of the mixed markets for general consumer goods. A typical independent market is represented by the fish market annexed to the previously mentioned Nabotas fishing port.

1-1-3 Problem Areas of the Fishing Industry

The nation is recording a tremendous growth in fish catch, a trend that will continue to grow further due to increasing domestic demand for fishery products, but from what has been grasped of the situation by our field survey, the following points are considered problematic, needing improvement by future fisheries policy measures.

(1) The coastal fishing grounds are gradually being depleted of fish stock by the operation of too many fishing boats.

(2) The fishing efficiency is declining due to intensive utilization of fishing grounds and also because the types of fishing method are fixed.

(3) As a sub-tropical country, the method of processing of fish is inappropriate. Improvement is needed in its method of preserving freshness and handling of fish.

(4) It is necessary for commercial fishing enterprises to advance into offshore fishery. Dispersed mode of operation should also be considered as a possibility.

1-2 Administrative Organizations Related to Fisheries of the Republic of the Philippines

Fishery in this country falls under the jurisdiction of the Department of Natural Resources, one of the 23 departments currently organized by President Marcos, and the Bureau of Fisheries within the above Department is responsible for the nationwide fisheries administration.

While the Bureau's major duties are the implementation of various laws and ordinances relevant to fisheries, the formulation of plans and programs related to fishery production and the compilation of fishery statistics, etc., it is also responsible for the formulation of various policy measures for improving the nation's fishing productivity and promoting fisheries. It has set up branch offices at principal local fishing area in order to smoothly carry out the fisheries administration.

Government organizations related to the promotion and development of the fishing industry are the Department of Public Works in charge of improvement of fishing ports, the National Economic and Development Authority in charge

of overall development planning of the economy and industry, and the Department of Industry in charge of industry in general, each cooperating with one another to carry out the fisheries policy measures effectively.

1-3 Relationship between the Fisheries Program and this Project

While fishery production in the Philippines is growing yearly at an average annual rate of 4.6%, the domestic demand for fishery products is a step ahead, growing at an average annual rate of over 5%. To cope with this situation, the Government established an expanded production program for the period between 1975 and 1978, aiming to raise the annual growth rate of fisheries production to 6.6%, thus achieving 1,647,000 tons of fish catch by the target year of 1978. This, however, was not achieved. Meanwhile, domestic demand for fishery products is likely to grow further, probably reaching 2,262,000 tons a year or 50% more than the current level within ten years from now.

Accordingly, self-sufficiency in food was incorporated as one of the principal targets of the nation's five year economic development plan launched in 1978, the achievement of which is being strongly urged.

The current status of the Philippine fisheries, however, is that there is every indication of accelerating decline in fish stock in the coastal fishing ground where most of the fishing is carried out so that fisheries production in some areas is decreasing rather than increasing. In order to expand production to meet the national requirement, the development of new fishing grounds and exploitation of offshore and deep sea fishing grounds have, therefore, become absolutely indispensable conditions.

It is against such a backdrop that this project is being implemented. Thereby, it will guide the Philippine fishing industry by elucidating, through survey and research, the various basic conditions of marine life, environment and fish resources in order to promote productivity and optimum utilization of resources. And it will contribute to the promotion and development of the Philippine fishing industry.

Chapter 2.

The Basic Design and Specification of the Fishery Training and Research Vessel

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2-1 Basic Policy

The basic policy lies in making the fishery training and research vessel, which will belong to the College of Fisheries of the University of Philippines, most suitably equipped for carrying out various research and studies of the ocean and for the boarding and training of undergraduate students as well as assuring the perfect functioning of its equipment and machinery and safety of navigation.

2-2 Purpose

2-2-1 Basic Planning Conditions

The plan and design of this vessel shall be implemented as per the following guidelines in accordance with the basic policy.

(1) Main dimensions

Length O.A	40.0 m
Breadth M.L.D	8.6 m
Depth M.L.D	4.6 m
Gross tonnage	360 tons

(2) Complement

The maximum number of people boarding this vessel shall be 40.

Total number of people: 40, of which

18 (Captain, Chief Engineer, Professor and Officers)

22 (Common Crew, Practicing Students)

(3) Fishing equipment

Equipment to be provided on this vessel shall be of the following three types, each of which shall be useful for experimental fishing operation and practical training of undergraduate students aboard.

a)	Midwater otter trawl	1 set
b)	Bottom otter trawl	1 set
c)	Purse seine	1 set

(4) Main engine, etc.

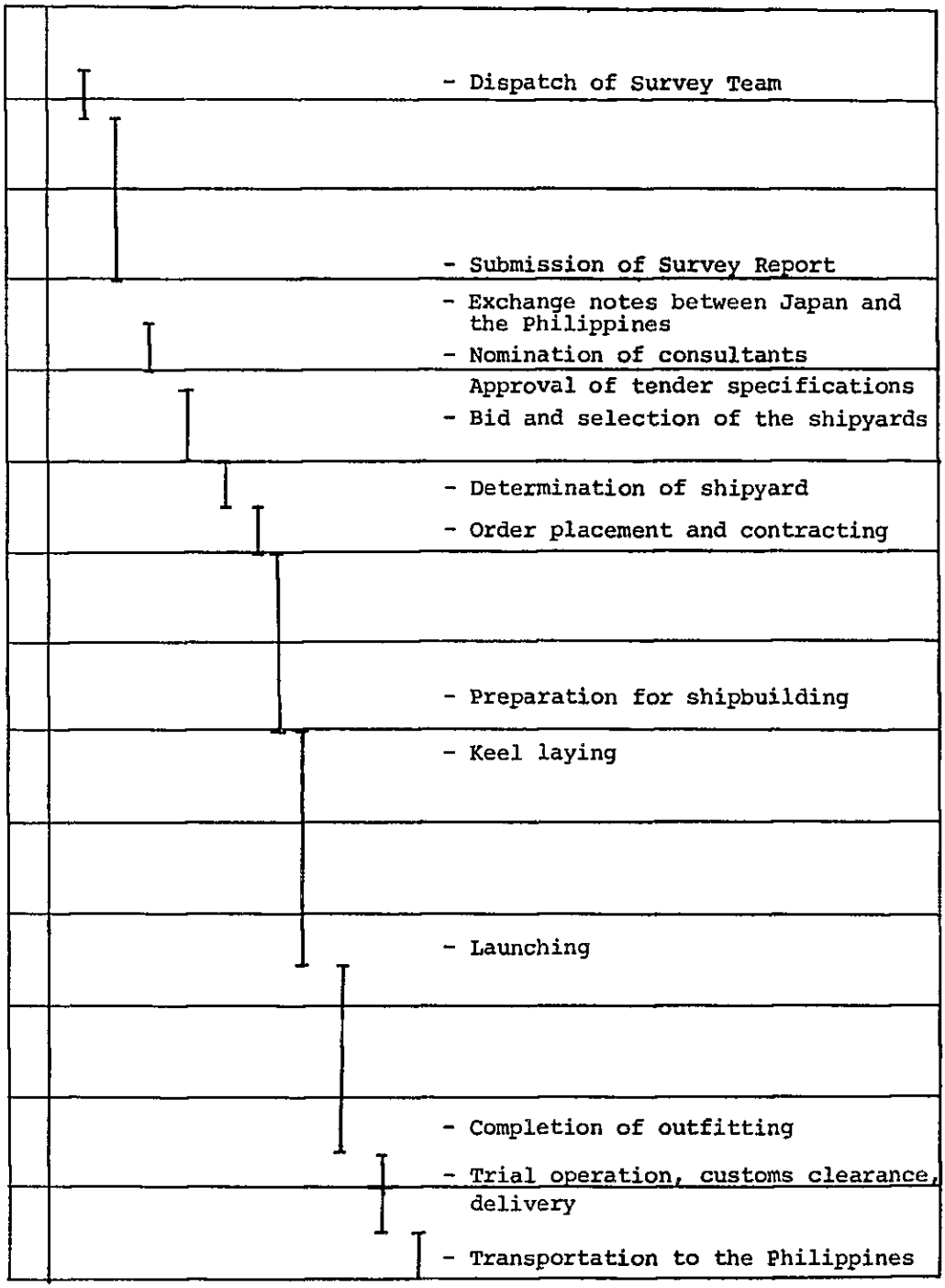
To be suitable for operation of this vessel:

a)	Main engine:	Marine diesel engine (1 unit)
b)	Engine output:	1200 HP (low speed)
c)	Fuel:	Marine diesel oil
d)	Screw propeller:	Controlable pitch propeller (1 unit)
c)	Speed:	Cruising speed about 10 knots
		Speed during trawling about 3.5 knots
f)	Duration of voyage:	15 days per trip

2-2-2 Building Schedule of the Vessel

The building schedule of the vessel to be granted is slated as follows:

(Unit: one section = one month)



2-3 Merits of Inducing the Vessel to be Granted

The 1977 fish catch in the Philippines was 1.51 million tons. It has been growing yearly due to purse seine fishing which has made big strides in recent years.

Yet, fishing industry in the Philippines, despite its large growth in production, contains many intrinsic problems which need to be solved if it is to establish itself as a stable industry and utilize the fisheries resource in an optimum manner. Scientific studies and survey of the ocean and fisheries resources, which are the fundamentals, must be carried out while the means of production such as fishing boats, fishing gears and fishing methods and shore facilities such as fishing ports, fish markets and distribution measures must also be improved if it is to make further development. The granting of the fishery training and research vessel, which will perform the leading role in this respect, will apparently contribute greatly toward promoting high-level survey and research of the ocean and fisheries resources in the Philippines. Synergetic effect with the achievements of past survey and research activities will enable the exploration of new offshore and deep sea fishing grounds and the identification and development of new marketable species. It will also eventually enable the Philippines to emerge from the present status of overly intensive fishing operation. Productivity will

be improved while the stock of fish will be maintained by optimum catch. It will raise the nation's food self-sufficiency rate, which is one of the targets of its economic development plan, and thus help meet the growing domestic demand for fishery products.

Modernizing the fishing in the island regions is another task of the fisheries administration, and the fishery training and research vessel can also contribute greatly toward this end by offering a full training course to the students of the College of Fisheries so that, upon graduation, they are fully prepared to serve in their duties properly and effectively in these regions.

2-4 Management and Operating Program for the Vessel

2-4-1 Management of the Operation of the Vessel

The vessel to be granted will be placed under the custody of the College of Fisheries, UP who will be fully responsible for its operation.

Its operating expenses will be requested as a necessary annual budget appropriation to the treasury of the University by the College of Fisheries. Since 400 thousand U.S. Dollars is allowed as estimated operating expenses for the vessel, no particular difficulty is envisaged for the operation of the vessel after it is granted.

Securing of Crew

All of the captain, officers and skilled crew for the vessel can be recruited in the Philippines.

Mooring Space

The vessel to be granted will use the Nabotas fishing port in the suburbs of Manila as its home base, where an exclusive mooring berth may also be reserved. Since the Nabotas fishing port is a large-scale port with adequate water depth to assure the safe incoming and outgoing of the vessel, no particular problem is expected in the use of this port.

2-4-2 Operating Program for the Vessel

Since the vessel to be granted will be used as a fishery training and research vessel belonging to the College of Fisheries, UP, its operating program must be coordinated with the curricula of the college. Its annual operating schedule will be divided into two semesters as follows:

First semester: October - March

Second semester: June - October

Since colleges in the Philippines have a three-month summer vacation from March to May, the vessel to be granted will be moored at dock and undergo repair and maintenance during that period.

Besides offering the usual services in oceanographic survey and experimental fishing operation, voyages during the first semester will place major emphasis on the training of senior students at sea. The second semester will concentrate on the survey of marine biology and fishery resources and fishing operations in the offshore and deep sea.

In principle, the vessel to be granted will make ten trips a year, each trip taking 15 days.

2-5 Specification of the Vessel

2-5-1 Specification

(1) Outline of the vessel

Gross tonnage	360 tons
Engine output	1200 HP (one unit of marine diesel engine)

(2) Structure of hull

a) The ship's hull shall be made of steel.

b) The hull shall be designed in accordance with the Steel Vessel Structural Regulations or the Steel-Made Fishing Vessel Structural Standards stipulated by the Maritime Bureau, Ministry of Transportation, Japan.

c) Ship's style:

The ship shall be the long forecastle deck type with the bridge being located further front of the center, the living quarters in the fore, the engine room in the center and the rear deck for fishing, below which fish holds shall be arranged.

(3) Inboard quick freezing plant

a)	Quick freezer	6 tons/day
b)	Freezing tank	about 10 m^3
c)	Refrigerant	R-22
d)	Fish hold	must maintain -20°C without fail

(4) Electric power

Generator	2 sets (to be of the same type)
Voltage	AC 440/220/100V or AC 220/100V

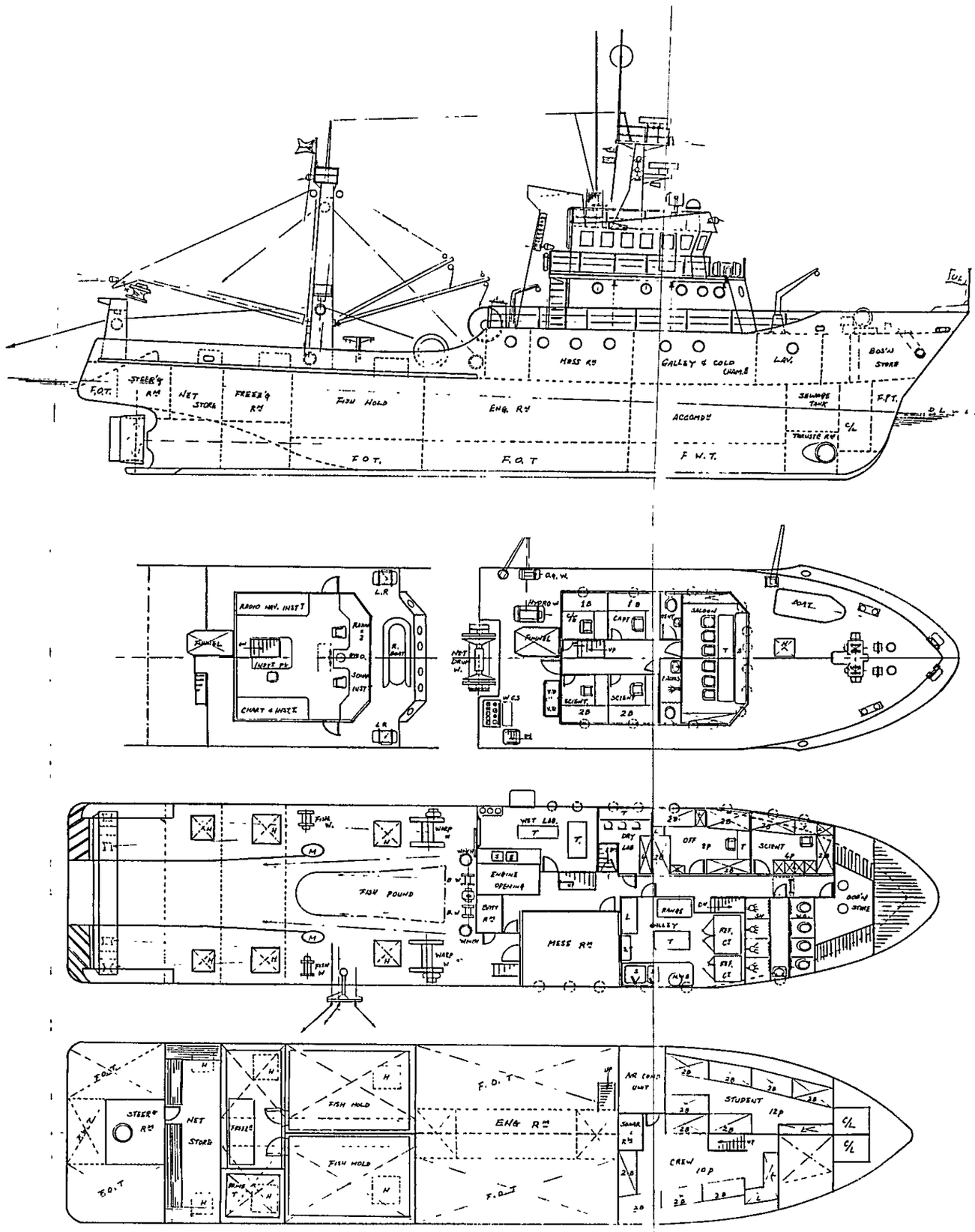
(5) Fishing apparatus

Fishing gear will be fully equipped. Winches for lifting nets, etc. shall be the hydraulic driven type.

2-6 The Oceanographic and Biological Research Equipment for the Research Vessel

a)	Sample collection devices	21 items
b)	Analytical apparatus for specimens	19
c)	Equipment for sample classification and education	6
d)	Equipment for survey by diving	4
e)	Equipment for statistical analysis and office work	5
	Total	55 items

The above listed equipment are all within the range of items necessary for oceanographic survey, study of fisheries resources, training of students aboard and other functions to be performed by this vessel.



PRELIMINARY GENERAL ARRANGEMENT OF
TRAINING AND FISHERY RESEARCH
VESSEL FOR COLLEGE OF FISHERIES
UNIVERSITY OF THE PHILIPPINES

LENGTH	A.O.	about	40'00
BREADTH (moulded)		"	8'60
DEPTH	(")	"	4'60
GROSS TONNAGE		"	360T
MAIN ENG.		DIESEL	1200 PS
SPEED		SERVICE	10 KT
CLASS		"	J.G.
COMPLEMENT			40 PSN

Chapter 3.

Remarks and Recommendations of the Survey Team

Chapter 3. Remarks and Recommendations of the Survey Team

3-1 Remarks of the Fishery Training and Research Vessel

This project is based on the national economic development plan and the fishing industry promotion measures of the Republic of the Philippines, and the implementation of this project is one of the urgent tasks being urged during the first phase. The University of Philippines (College of Fisheries), which is the proposed recipient of the fishery training and research vessel, is an institution that boasts many remarkable achievements in the field of research and survey on marine biology, fisheries resources and other subjects directly relevant to the promotion and development of the fishing industry of the Philippines to which it has contributed greatly during the past 20 years. Needless to say, for the Philippines whose specialized research institutions for fisheries and fishery products are not yet fully developed, the results of survey and research performed by the College of Fisheries, UP are invaluable indeed. The sophisticated knowledge and technical skill of the faculty members of the College are the first rate and highly evaluated, so that even at present, maintenance, control and operation of existing fishery training and research vessels are being carried out satisfactorily. Some of their past survey and research results are truly outstanding. Not only are they enthusiastic in

the pursuit of their survey and research activities, but they are sincere in their guidance and training of undergraduate students, sparing effort to develop capability that may someday lead the Philippine fishing industry.

The granting of the fishery training and research vessel from Japan in compliance with this project seems quite appropriate and the effects induced from its operation are also expected greatly.

Arrangements for adequate maintenance, control and effective utilization of the vessel as well as securing its crew and mooring space seem quite satisfactory. As no difficulty is foreseen in these respects, the survey team anticipates smooth operation and effective utilization of the vessel.

3-2 Recommendations

As stated above, the granting of this vessel to the University of Philippines (College of Fisheries) under this project is judged to be appropriate and reasonable. The survey team has no apprehension whatever with respect to its custody and operation. However, in order to further enhance the merits of its utilization and smooth operation, the team wishes to urge that the following matters be carefully studied and executed with discretion.

3-2-1 Custody and Operation of the Vessel

(1) The budget appropriation for the maintenance, control operational expenses (including manpower costs) shall include a special budget, in addition to the ordinary budget, in order to provide for contingencies such as damage to the hull, engine breakdown or malfunctioning, mending of instruments and loss of fishing gear.

(2) Full-time administrative personnel in charge of custody and administration of this vessel shall be appointed to direct the vessel's entry and departure from port on the spot and conduct periodical maintenance work in the repair dock regularly. They shall also be responsible for smoothly performing the purchasing and replenishing of the ship's store and supply so as to eliminate any hinderance to the operating schedule of the vessel.

(3) In reserving a mooring berth for this vessel, care must be taken to secure adequate space to avoid damage to the vessel by contacting with other vessels. Access of outsiders to the vessel shall be prohibited while the vessel is moored. Also, electrical equipment for navigation, etc. shall be covered while the ship is stationary to avoid damage or trouble by tampering.

(4) For docking, a shipyard or repairer shall be selected, where periodical maintenance and inspection of the hull shall be performed.

3-2-2 Inboard Facilities and Equipment

(1) A person of specialized technical skill shall be appointed to be in charge of electrical equipment so that no damage or failure attributable to erroneous manipulation or inexperience shall occur.

(2) Since accidents are prone to occur on the fishing deck due to the use of winches, throwing and lifting of fishing gear and so forth, instruction and guidance shall be provided so that student apprentices aboard are trained in small groups, while the clustering of too many students on the fishing deck at any one time shall be prohibited to prevent human hazards.

(3) Special attention shall be paid against leakage of R-22, which is used as refrigerant for the inboard freezing equipment installed. Since the refrigerant R-22 is odorless, it may cause human hazard by anoxia if leakage continues in a closed section. Inspection by detector, therefore, must be performed every day without fail.

3-2-3 Oceanographic and Biological Survey and Research Equipment

Various equipment and instruments provided on the training and research vessel are indispensable to the survey of the fishing grounds and the ocean, an activity in which this vessel shall play the central role, and also to the education and training of students. Since such equipment and instruments must be manipulated aboard a ship sometimes placed at the mercy of vehement pitching and rolling due to strong winds and currents, they must be of simple design to the extent permissible, yet of high precision, easy to operate and durable. As their minute mechanisms, particularly the electric circuits and the wiring, are easily eroded by sea water, the utmost care must be taken to preserve them in good condition. Also, since these various equipment and instruments will be installed on deck along with other fishing facilities, a special arrangement must be devised to insure their function and coordination so that they may be used safely and effectively within the limited space aboard the ship.

Since the College of Fisheries, UP is already experienced in the use of some of these equipment and instruments which they are using in conjunction with trawl and purse seine fishing facilities aboard their research vessel Albacore, we believe the college faculty will have no

difficulty in operating them satisfactorily on the new research vessel as well.

As long as the equipment mounted on the ship are effectively utilized, we have no doubt that they will contribute greatly to furthering research on fisheries resources and fisheries education in the Republic of the Philippines.

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