EXPRESSION OF INTEREST (EOI)

Annex 3.1

Technical Note – Project Presentation

Project Title:	**FAME RESEARCH VESSEL**
Nature of the services	Build a fisheries research vessel for the Pacific Community
Location:	Pacific Region
Date of issue:	11/09/2023
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Contents

1 INDEX OF REVISION

1	17/07/2023	General Update	CP & AT	LM	AT
0	30/06/2023	First emission	CP & AT	BL(SPC)	LM
Revision	**Date**	**Modifications**	**Writer**	**Checker**	**Appr.**

2 INTRODUCTION

The purpose of this document is to describe the SPC's requirement for its future fisheries research vessel (the Vessel).

This vessel will be built under the authority of the FAME (Fisheries, Aquaculture and Marine Ecosystems) division of the Pacific Community.

The Vessel purpose is to support fisheries research that underpins tuna fisheries management in the Western and Central Pacific Ocean

The Vessel capability will also include disciplines of oceanography: physical oceanography and biogeochemistry; biological oceanography and ecosystem functioning; undertaken in the coastline to the open sea environment.

The vessel shall be equipped with a high-performance land-sea satellite link.

Facilitate onboard training in marine science fields should be considered in the vessel design.

The Vessel shall be is designed and built for classification by Bureau Veritas.

The description of missions, the general design principle, the dimensions and equipment described in this document are given only for information by the Contracting Authority and are not mandatory at this stage of the process.

3 DEFINITIONS

"**Classification Society", "Class**": means Bureau Veritas,

"**Contracting Authorit**y": means SPC (The Pacific Community),

"**Contractor**": means the tenderer during tender process, then, after signature, the contractor of the construction contract relative to the present call for tender,

"**CTD**": stands for Conductivity Temperature Depth measurement device,

"**FAD**": stands for Fish Aggregating Device,

"**FAME**": stands for Fisheries, Aquaculture and Marine Ecosystems division of the SPC,

"**Supplier**", "**subcontractor**": refers to the company which supplies material or studies to the Contractor as part of the design & construction contract,

"**Vessel**", "**ship**": means the FAME Research vessel.

4 MISSIONS – SCENARIOS

The objective of the project is to build capacity for fishery management and integrated approaches to climate change adaptation.

There is a need for capacity building in the Pacific and a growing effort to increase the level of ocean expertise of Pacific Islanders.

Four functional mission scenarios have been defined which concern each of the capabilities the vessel must address. All mission scenarios require that Contracting Authority systems are onboard but deployed successively. They are detailed below. In addition to scientific research missions, the vessel will also address a complementary educational mission.

4.1 Tuna tagging and fish sampling research cruises (S1)

The research vessel design includes an efficient capability for pole-and-line (P&L) fishing methods to catch, tag and release multiple thousands of tunas per day. The bow area reference is the Japanese P&L bow design, which has been fine-tuned over the last hundred year for commercial fishing operations in the Pacific Ocean.

The vessel will also have the capability to catch and keep alive fish baits that are essential for P&L fishing gear.

Additional fishing gears (horizontal longline, hydraulic reels, troll lines) will allow the capture and tagging of the full-size range of tropical tuna species in various environments and remote areas when live fish bait is not available.

The hydraulic reels will also allow the capture of deep-water fish species that are an important resource in the tropical Pacific region. The size of the vessel allows the exploration of coastal areas but also remote seamounts that have received little historical fishing pressure.

4.2 Ecosystem monitoring (S2)

The vessel will be involved in dedicated research cruises that collect information on essential ecosystem physical parameters and on the lower levels of the food web, such as plankton and tuna prey (micronekton), to monitor ecosystem change, discover new species, map the vast ocean biodiversity and its genetic resources.

The vessel should have the capacity and equipment to operate tows of pelagic nets (micronekton and plankton collection)

4.3 Bathymetry survey (S3)

To navigate safely between islands, appropriate navigation charts are necessary. Bathymetric surveys are needed to create new charts and to update charts created with inaccurate and/or old bathymetric data.

In order to update regional chart bathymetry and improve navigation safety in identified coastal areas, the vessel will be able to deploy scientific multibeam echosounders onboard an auxiliary boat to perform coastal survey operations in shallow areas.

4.4 Equipment deployment (S4)

The vessel will provide capability for:

- supporting specific missions involving diving (diving container carriage).
- the deployment and maintenance of ocean observation equipment for regional monitoring networks and early warning systems. The types of equipment deployed include ocean and weather buoys, floats and ocean gliders, which are components of national, regional or international networks (TPOS, GOOS etc)
- the deployment of coastal anchored FADs and open ocean aquaculture sea cage moorings.

4.5 Complementary educational missions

In addition, in order to promote and participate in Pacific country and territories capacity building, research cruises will have the capacity to include students and instructors, with a mix of ship operations training and regular classroom work.

This "floating university" concept is compatible with and can be complementary to other activities such as ecosystem research cruises and bathymetric surveys. This regional vessel training capacity could also be included within regional maritime academies that train maritime professionals.

4.6 Mobile equipment's

A preliminary list of mobile equipment required for each of the typical missions to be carried out on the vessel is given below:

Mobile equipment	Mission scenario			
	S1	S2	S3	S4
CTD profiler	✓	✓	✓	
CTD winch	✓	✓	✓	
Multibeam echosounder			✓	
Pole and lines	✓			
Danglers/jgs	✓			
Longline fishing reel	✓			
Shooter	✓			
Plankton net		✓		
Plankton / hydrology winch		✓		
Micronekton trawl + gear		✓		
Pelagic trawl + gear		✓		
Trawl winches		✓		
Trawl reel / net drum		✓		✓
Nets / lines hauler	✓	✓		
Diving container				✓

Legend: ✓ in place for simulaneous use

All equipment not in use for a specific type of mission are considered stored onboard and ready for installation using vessel own capacities, except for the diving container.

5 BASIC REQUIREMENTS

5.1 General characteristics

The ship will be a monohull vessel. The design is inspired by Japanese pole & line commercial fishing vessels and latest research vessels.

It will have capacity and desk surface to allow various methods of tuna fishing, tagging and sampling, as well as laboratories and scientific spaces enabling scientists to prepare and treat onboard measurements and samplings.

The vessel will comply with the following general dimensions and characteristics:

- length overall: Around 45 m,
- hull breadth: Around 10 m,
- depth to main deck: Not more than 9 m,
- maximum design draught with retracted drop-keel: Not more than 3.5 m,
- maximum design draught with lowered drop-keel: Not more than 4.5 m,
- freeboard at maximum draught to main deck Between 1.5 and2 m,

A Diesel-electric drive with batteries power back-up will be chosen both for its operational flexibility and its noise performances.

The design and construction will comply to regulation for [ship of gross tonnage above 500 / fishing vessel above 45m in length] in all cases, even if [the gross tonnage is below 500 / the length is above 45m], to allow a future jumboization.

The Vessel will be designed for operation and maintenance with maximum 26 people onboard including up to 20 crew and up to 12 special personnel (or a combination of passengers and special personnel).

5.2 Exploitation conditions

A 255 days per year total exploitation duration shall be considered for design process. This vessel will be designed to operate unrestrained, and in particular over the WCPO (Western and Central Pacific Ocean). The ship's activity is distributed as follows:

- Equatorial area (10N-10S) for tuna tagging and sampling cruises (S1)
- Subtropical and equatorial areas (15N-20S) for ecosystem monitoring (S2)
- All areas of WCPO for other missions (S3 & S4)

5.3 Building materials

The vessel will be built of steel. Aluminium alloy may be used for superstructures.

5.4 Handling / deck equipment

The vessel will be equipped with a stern A-frame and an offshore crane, as well as locations for removable containers (for diving or specific mission).

5.5 Fishing equipment

The vessel will receive fishing gear and equipment to allow tuna resource monitoring (non-exhaustive list):

- bait catching with Bouke Ami net, including live bait tanks, light generating raft, auxiliary dinghy
- pole & line tuna fishing with dedicated platforms and water spraying
- longline fishing (reel, shooter, etc.)
- danglers & reels fishing
- nets / lines hauler
- A-Frame and cable winch (5 Ton class)

5.6 Scientific equipment

The vessel will receive mono-beam echosounders and ADCP's transducers integrated in a drop-keel.

The vessel will allow the deployment of (non-exhaustive list):

- plankton nets,
- micronekton and pelagic trawls (trawl winches, net drum, etc.),
- on-board CTD probe / water sampler

5.7 Autonomy, lifecycle, and maintenance

The Vessel shall be built to be operated for 40 years with mid-life retrofit.

She will be designed with an operational capability of more than 255 days at sea per year, an annual range of 25000 to 30 0000 nautical miles and a minimum endurance of 25 days at transit speed of 10 knots.

The food and beverage autonomy will be of 3 weeks to 1 month with 26 persons onboard.

The vessel will be optimized for operation and maintenance under Marshall Islands flag with 12 to 20 crew, without major overhaul for 36 months.

She will be designed in such a way that she will be the most autonomous, flexible and modular than possible.

6 GENERAL DESCRIPTION OF ENERGY CONSUMPTION AND ENVIRONMENT IMPACT REDUCTION PRINCIPLES

Taking a new step in reducing the environmental impact requires acting on both the initial design of the new vessel and its operation.

The objective set for this new vessel is to operate with a reduction in CO2 emissions of up to 50% compared to current equivalent vessels, by working on efficient use, optimal operational planning and by adopting technological solutions.

Measurements of electrical consumption in different operating phases that are representative of an oceanographic vessel shows that the priority actions to reduce the overall environmental impact are to reduce propulsion consumption, optimize the management of heat energy and reduce lighting consumption. The following minimum is foreseen in priority:

- **Energy and propulsion**. A diesel-electric installation with battery power back-up in option will be chosen for both its operational flexibility and its noise performances. The possibility of using biofuels will be studied (min: B7, target: B30). Wind propulsion complementary to the main propulsion may be implemented. The vessel will be designed "ready for" the implementation of new future

technologies when they become more reliable. To this end, the design will technically accommodate the possible addition of a future ship section (jumboizing, e.g., a new or additional propulsion system and its auxiliaries).

- The vessel will use low polluting technologies to comply with environment requirements and shall be built with a limited environmental impact. The vessel requires the largest possible share of recycled or bio-sourced construction materials.
- The ship's energy optimization will be particularly advanced, via insulation solutions and the recovery of energy lost as heat.