

Supply of a vibrocorer

Sébastien MORVAN

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1. Introduction

1.1. Purpose of this document

This document specifies the requirements for the supply and the tests of a vibrocorer for the French oceanographic fleet.

1.2. Reference documents

The main documents associated with this functional program are:

- [1] Coring areas to validate the system
- [2] General arrangement of the vessel *Côtes de la Manche*
- [3] General arrangement of the vessel *Anita Conti*

2. Presentation of the requirement

2.1. Scope of works

The requested service can be summarized as follows:

- Manufacturing of a vibrocorer and associated equipments
- factory, quay and sea trials,
- Documentation,
- Supply of spare parts / consumables,
- Training in the use and maintenance of the vibrocorer.

2.2. Applicable codes and regulations

The following regulations apply in last revision: CE certification.

2.3. Documentation and plans

During the design phase, the supplier will send the documents for approval to Ifremer. The deadline for approving documents will be 10 working days.

All documents submitted by the supplier will be in French or in English. Upon delivery of the vibrocorer to the site, the documentation will be delivered in 1 hard copy and digital copy. All drawings will be provided in *.dwg format and in PDF format. 3D models (*.stp) will also be provided to Ifremer.

The following minimum documents must be provided to Ifremer by the supplier in 1 hard copy plus a computer version (MICROSOFT OFFICE for reports, AUTOCAD for drawings and STEP for 3D models).

- an overall drawing of the installation with integration on deck,
- an installation and handling notice specifying the weights, centers of gravity and congestion of the main components as well as the handling points considered,
- an electrical interfaces notice specifying the nature of the currents and signals as well as the type of electrical cables desired,

- test procedures considered.
- the instructions for use and maintenance,
- test and proceeds reports,
- the special instructions,
- test and acceptance tests.

2.4. Commissioning

The supplier will assist crewmembers in the use and maintenance of the entire supply. This commissioning will take place during the dock and sea trials.

The commissioning will be organized for 5 people during sea trials and will include:

- a theoretical part with a review of systems and functions
- a practical part during which all operations will be validated
- adjustment of sensor parameters and communication
- Replacement of main components (motors, steel pipe, plastic tube, etc.).

3. Requirements

3.1. Main functions and requirements

3.1.1. Generalities

The main requirements for the vibrocorer are:

- length of corer 3+3m (two parts) with possibility to increase to 9m
- maximum working depth 250m
- Liner material Non-transparent plastic (PVC, PEHD...)

The motors must be sized to extract coarse sediments such as coarse sand, gravel and pebbles. Their vibration force should be adapted to this important requirement.

The coring operations will carry out

- Directly with the rear A-Frame, the vibro-corer will remain in a vertical position throughout the operation
- Directly with the rear A-Frame, the vibro-corer will start the operation in a horizontal position on deck and will be deployed to the sea in vertical position
- With the vessel's oceanographic crane to the lateral T-frame. The crane will launch the vibro-corer, then the lateral T-frame or rear A-frame will complete the operation down to the seafloor

The vibrocorer's frame should be adaptable and modular, based on the corer's length. When we'll operate the 3m configuration, the width base support shouldn't be more than 3,7m and for the 6m configuration it shouldn't be more than 5m.

At sea, the capacities of our gantries and crane are:

- Winch and Gantry (For 3m configuration on RV *Côtes de la Manche*): SWL 5t
- Winch and Gantry (For 6m configuration on RV *Anita Conti*): SWL 7t

- Crane (for 6m configuration on RV *Anita Conti*): 6t@6,5m (operation with lateral T-frame) and 2,1t@14m (operation with rear A-frame)

For information, the general arrangement of our vessel *Côtes de la Manche* and *Anita Conti* are attached to this document (appendix [2] and [3])

The vibrocorer will be supplied with a 20ft container in which we can store all the components, spare parts, and consumables (plastic pipes). This container will be fitted with custom structures for the correct storage of these components.

3.1.2. Painting

The chosen paint system will be from *International*.

- a sandblasting Sa 2.5 (see ISO 8501-1),
- a coat of zinc silicate 60 µm,
- a coat of anticorrosive primary epoxy ≥ 70 µm,
- an epoxy undercoat..... ≥ 150 µm,
- two layers of polyurethane finish 2x50 µm.

The final thickness of the paint film will not be less than 400 µm.

Stainless steel parts will not receive paint.

3.1.3. Handling and installation on board

The equipment will be equipped with slinging lugs provided on the frames so that the handling operations take place without risk of permanent deformation or significant elastic deformation. If these operations require special tools (eyebolts, rudder, slings, etc.), it is to be provided by the supplier. &

3.1.4. Electrical protections

The degree of protection of electrical equipment and materials will not be less than IP68 @300m/30bar

The electrical connectors used will be SUBCONN® (model METAL SERIES) or equivalent. Each connector will have a screwed protection cap.

3.2. Interfaces

The supplier must establish during the studies a coordination plan that will specify all the interfaces and their specifications.

3.2.1. Electrical interfaces, strong currents

The source of electrical energy will available on board have the following characteristics:

- 380/400V, 50Hz
- 230V, 50Hz

The electrical cable (from vessel to the vibrocorer) must be reeled on a specific drum supplied with the vibrocorer.

3.2.2. Scientific network

Sensors data (inclinometer, penetration rate, penetration distance and power consumption during operation) have to be relay to the scientific network by RS422 or ethernet cables during operation.

3.2.3. Command control

A control command box will be supply with:

- Vibrocorer's commands
- Datas' visualization (inclinometer, penetration rate, penetration distance and power consumption during operation)

3.3. Equipment tests

The supplier of the equipment must notify Ifremer at least two calendar weeks in advance of the scheduling of the Factory Acceptance Test and send them detailed information about the equipment.

Ifremer will advise the supplier two calendar weeks before the Harbour Acceptance tests and Sea Acceptance Tests.

The programme of these tests will be agreed upon by Ifremer and the supplier during the studies. Ifremer's representatives will attend all the tests, paying particular attention to the acceptance tests.

3.3.1. Factory acceptance tests (FAT)

The objective of the factory acceptance tests is to verify that the equipment's expected functional and operational characteristics are achieved as expected.

The equipment will be weighed and measured.

Accessibility of the various components, and compliance with drawings, diagrams and specifications, will be checked for both general devices and command-control systems.

The assembly, functional tests and disassembly will also be checked.

3.3.2. Harbour acceptance tests (HAT)

The HAT will take place just before the sea acceptance tests. These tests are intended to allow:

- Assembly of the vibrocorer on board;
- Deployment of the vibrocorer from the vessel to the surface of the sea;
- Training.

Ifremer will provide the logistics for these tests.

3.3.3. Sea acceptance tests (SAT)

The tests at sea are intended to verify:

- that the equipment achieves the performance requirements,
- the proper functioning of the entire installation under operational conditions.

Ifremer will provide the logistics for these tests.

The supplier shall assign at least one person to the conduct of such trials at sea for a period of two days at sea. The supplier's representatives shall be accommodated and fed on board the vessel. This trial period will also be used to close the training of staff present during this phase of acceptance tests.

3.3.4. Performance to be achieved

The final acceptance of the vibrocorer is conditioned by:

- A penetration similar or better than that obtained previously with other vibro-corers on the coring sites (see reference document [1]). A margin of 10% will be accepted on the penetration rate.
- Opening of cores on board to check sediments
- The quality of the sediment samples (deformation, disturbance) taken have to comply with our database (see reference document [1])
- The correct extraction of coarse sediment such as sand, gravel, pebbles, etc...

Otherwise, the supplier will have to review the design and restart the SAT.

3.4. Spare parts and consumables

Some spare parts and consumables will be supplied with the vibrocorer. The supplier must complete an Excel file detailing the spare parts and consumables that can be supplied.