

**Tide Gauges Stations for Mauritania, Cape Vert, Senegal and
The Gambia under the MARINEMET Project
Spanish West African Countries Cooperation Program
Technical Requirements Document**

Contents

1.	BACKGROUND	3
1.1	Objective	3
1.2	Description and Location of the Equipment Covered by the Contract	4
2.	COMPANY BACKGROUND	4
3.	TECHNICAL REQUIREMENTS FOR TIDE GAUGES	5
3.1	GLOSS program requirements	5
3.2	Specific Technical requirements for this project	6
4	CONDITIONS OF THE LOCAL SITE	7
4.1	Minimum requirements	7
5	MAINTENANCE REQUIREMENTS	7
5.1	General logistics and operation	7
5.2	Routine or preventive maintenance	8
5.3	Extraordinary maintenance due to damage	10
5.4	Extraordinary maintenance due to accidents	10
5.5	Especial clause: Monitoring reports and delivery of raw datae	11
6	RACCEPTANCE / TRAINING AND TAKE OVER	12
6.1	Factory acceptance test	12
6.2	Training	12
6.3	Site acceptance test	12
7	DOCUMENTATION	13
7.1	Equipment/Software Technical Documentation	13
APPENDIX 1: DOCUMENTS TO BE PROVIDED WITH THE TENDER REPLY AND EVALUATION CRITERIA		14

1.- BACKGROUND

The Government of Spain established a Trust Fund in the WMO Secretariat in 2007 through the State Meteorological Agency (AEMet), at the time the National Meteorological Institute (INM), to support the Cooperation Programme for West African countries. In order to initiate the relevant activities, it organized a Meeting of Directors of the National Meteorological and Hydrological Services (NMHSs) of those countries in Las Palmas (Canary Islands, Spain) between 17 and 23 October 2007. The Meeting decided to create a Forum of Directors of NMHSs of North Africa and West Africa to meet annually, and adopted the Las Palmas Action Plan.

Following Las Palmas Action Plan, an expert meeting on West Africa Marine Meteorology was held in Dakar (Senegal), from 27 to 29 February 2008, at the Direction de Météorologie Nationale. Thirty participants from both NMHS and Maritime/Port authorities from Mauritania, Cape Vert, Morocco, Senegal, Cote d' Ivoire and Spain attended the meeting. This activity was a follow-up of the Las Palmas Action Plan and was supported in the framework of the Spanish cooperation in close collaboration with WMO.

Mauritania, Cape Vert, Morocco, Senegal and Cote d' Ivoire presented a diagnostic of the situation on marine meteorology in their region to provide valuable information on their capabilities to help identify their needs and requirements. An integrated Spanish proposal was presented and discussed. The group noted that the Spanish proposal covered the development of both marine meteorology and oceanographic products and services and would contribute to the needs expressed by the countries in the region to improve marine meteorological services for maritime safety and fisheries management. The Meeting requested WMO Secretariat and AEMET to draft the Terms of Reference (ToR) of this pilot project (MARINEMET) and circulate among the participants and the Ad-Hoc Regional Sub-project Team.

The draft ToR was presented during Meeting of the Conference of Directors of the West African NMHSs held in Niamey, Republic of Niger, 13 to 14 November 2008. The Conference requested WMO Secretariat and AEMET to finalise this ToR that was endorsed at the Niamey Conference of Directors and to commence the Project implementation as soon as possible. It was also requested to include The Gambia in this first stage and to consider as a second stage the expansion to other countries in the Gulf of Guinea.

The ToR of this pilot project were approved in the MARINEMET Project Meeting and Management Workshop for Directors of Meteorological Services in Dakar, Senegal, from July 13th to July 17th, 2009.

To carry out with the MARINEMET objectives, the acquisition of six sea level station is needed:

- Two of those stations, for fixed platforms, having the ability to make measurements of sea level and agitation by means of radar sensors (to be installed in Dakar – Senegal – and Mindelo – Cape Vert)
- The 4 remaining will be standard stations, to be installed in Nouadhibou - Mauritania-, Praia -Cape Vert-, St.Louis -Senegal- and Banjul -The Gambia-.

The budget equivalent to a standard station will be reserved for the acquisition of supplies.

1.1.- Objective

1.1.1.- The objective of the work and services to which the Contract relates is to carry out all the concepts and elements needed for the installation and operational use of the tide gauges

of the sea level stations included in the MARINEMET project, in accordance with the minimum efficiency ratios required by this document, ensuring:

- 1.1.1.2.- The provision of six complete radar stations measuring sea level, having two of them sea's agitation measurement capability
- 1.1.1.3.- The site selection, installation, putting into operation and maintenance of the measuring point for a period of 4 years.
- 1.1.1.4.- The training of technicians (training courses) of the recipient countries.
- 1.1.1.5.- The delivery of biannual maintenance and raw data reports
- 1.1.1.6.- The quality and continuity of the data recorded, both stored "in situ" and transmitted to the Puertos del Estado Monitoring Centre in Madrid.
- 1.1.1.7.- The good condition of the equipment, including the spare parts and components in the Contractor's logistics fleet.

1.2.- Description and Location of the Equipment Covered by the Contract

1.2.1.- The contract will cover the supply, installation and maintenance of two sea level stations equipped with frequency scanning radar sensors for measuring agitation parameters, located at the ports of Mindelo (Cabo Verde) and Dakar (Senegal), and four sea level stations based on pulse radar (without agitation) at the ports of Nouadhibou (Mauritania), Saint Louis (Senegal), Praia (Cabo Verde) and Banjul (Gambia).

1.2.2.- The six stations will be required to transmit sea level data by satellite (METEOSAT) every 15 minutes, with a 1 minute sampling frequency, to be received by AEMET (Madrid) and, from there, sent to Puertos del Estado (in ESEOO-XML format). In the case of the two stations that include agitation, wave parameters should be calculated and included in the records for transmission every 20 minutes.

2.- COMPANY BACKGROUND

2.1.- The company offering equipment for this project shall have a long history (specify) (10 years or more) and proven track record in design, manufacture and after sales support of meteorological and marine sensors and data collection systems. The company shall have sufficient and documented financial, human and technical resources to implement large-scale system deliveries.

2.2.- If the company supplying equipment to the project has the approved ISO 9001 Quality Assurance System, certified by an accredited authority, the copy of this certificate attached to the technical proposal will be considered an advantage.

2.3.- As a part of their Quality Assurance System, the company should operate the laboratory facilities for sensor testing and calibration. These facilities and the primary standards used shall be traceable to the international standards. The quality assurance system shall be documented in writing in the technical proposal.

2.4.- The company shall have a spare parts policy and sufficient financial resources for ensuring the availability of the spare parts for minimum of ten (10) years after finishing the deliveries of the tendered equipment. In order to show this compliance, the financial statements of the last two (2) years must be included together with the price proposal.

2.5.- The company shall have financial, human and technical resources to successfully complete even most demanding projects. Therefore, the company submitting the proposal shall have the annual revenue minimum of ten (10) times larger than the total value of the tender proposal.

2.6.- It will be an advantage, and taken into consideration, if the company has sufficient technical and other resources for supporting the installed system locally in Mauritania, Cape Vert, Senegal and Gambia. Description of these resources (specify) shall be included in the technical proposal or its appendixes. The bidder will provide details (descriptions, addresses, and contacts) of its branch offices, partners, or affiliates that would provide human and technical support, and assistance to beneficiary countries (Mauritania, Cape Vert, Senegal, The Gambia) during and after the installation of these stations.

2.7.- The interested companies are required to submit detailed description of the proposed hardware and software implementation of the specification of this document. See the Appendix 1 for documents to be supplied together with the tender reply.

3.- TECHNICAL REQUIREMENTS FOR TIDE GAUGES

3.1.- GLOSS program requirements

3.1.1.- All the sea level stations should fulfil the requirements of international programs such as GLOSS (Global Sea Level Observing System) or the different Tsunami Warning Systems, in order to get multi-purpose stations: tide prediction, long-term mean sea levels and extremes, storm surge forecasts, tsunami warning, agitation models, etc. On the other hand, some additional requirements will be added to get an automatic integration on Puertos del Estado and MARINEMET project web pages) and data processing, and for those stations supposed to provide also agitation or wind wave parameters.

3.1.2.- The aim of any tide gauge recording should be to operate a gauge which is accurate to better than 1 cm at all times; i.e. in all conditions of tide, waves, currents, weather etc. This requires dedicated attention to gauge maintenance and data quality control. In brief, the major requirements for GLOSS stations are (Manual on Sea Level Measurement and Interpretation, IOC Manuals and Guides N° 14, Volume IV: An update to 2006. UNESCO):

- i) A sampling of sea level, averaged over a period long enough to avoid aliasing from waves, at intervals of typically 6 or 15 minutes, or even 1 minute or less if the instrument is to be used also for tsunami warning (IOC 1997 states: 'but in all circumstances the minimum sampling interval should be one hour', which these days is an insufficient sampling for most agencies);
- ii) Gauge timing be compatible with level accuracy, which means a timing accuracy better than one minute (and in practice, to seconds or better, with electronic gauges);
- iii) Measurements must be made relative to a fixed and permanent local tide gauge bench mark (TGBM). This should be connected to a number of auxiliary marks to guard against its movement or destruction. Connections between the TGBM and the gauge zero should be made to an accuracy of a few millimetres at regular intervals (e.g. annually);
- iv) GLOSS gauges to be used for studies of long term trends, ocean circulation and altimeter calibration need to be equipped with GPS receivers (and monitored possible by other geodetic techniques) located as close to the gauge as possible;
- v) The readings of individual sea levels should be made with a target accuracy of 10 mm;
- vi) Gauge sites should, if possible, be equipped for recording tsunami signals,

implying that the site be equipped with a pressure sensor capable of 15-seconds or 1-minute sampling frequency, and possibly for recording wave conditions, implying 1-second sampling frequency;

vii) Gauge sites should be also equipped for automatic data transmission to data centres by means of satellite, Internet etc., in addition to recording data locally on site;

viii) Sea level measurements should be accompanied by observations of atmospheric pressure, and if possible winds and other environmental parameters, which are of direct relevance to the sea level data analysis.

3.1.3.- Apart from these requirements demanded by GLOSS is necessary that the tide gauges that will be acquired by these Technical Requirements expire with the following technical requirements:

3.2.- Specific Technical requirements for this project:

3.2.1.- With respect to this project, these requirements should be fulfilled by means of radar sensors with 1-min sampling frequency at all the stations (no need of extra pressure sensors). Some of these stations will also provide agitation or wind-wave parameters, for which a different type of radar is needed, (CWFM: Continuous Wave Frequency Modulation). No CGPS will be included. This would be the list of detailed technical requirements to be fulfilled by the stations installed within this project:

3.2.1.1.- Sea level measurements with millimetre resolution

3.2.1.2.- Minimum output: date, hour (seconds), sea level (mm), battery voltage level

3.2.1.3.- Maximum raw data sampling of 1 Hz (better 2, 4 or 8 Hz) (just for stations including agitation)

3.2.1.4.- Internal computation of wave parameters for validation of agitation models (just for the stations including agitation)

3.2.1.5.- Final data sampling (averaged value) configurable from 1 second to several minutes

3.2.1.6.- Accuracy of 1 cm for 1 second data and 1 mm for averaged measurements (1 minute), for a maximum sea level range of 20 meters

3.2.1.7.- High precision internal clock, automatically updated by GPS, at least daily, if possible hourly

3.2.1.8.- 1-min data transmission each 15 minutes through METEOSAT, with redundancy of systems of data transmission based on technologies such as ADSL, GPRS or Internet connection (several serial ports available) desirable. Data reception at AEMET (Spain), ANAMS (Senegal), ONM (Mauritania), INMG (Cape Vert) and DWR (The Gambia)

3.2.1.9.- Datalogger with in situ data storage capacity for at least 120 days of raw data, if possible more, and if possible with data base capability (optional)

3.2.1.10.- Integration of data on the WIS (WMO Information System) with redundancy of data availability

3.2.1.11.- Redundancy of power supply (batteries, solar panels, etc)

3.2.1.12.- Redundancy of equipments (e.g. a radar and a pressure sensor, optional)

3.2.1.13.- Possibility of configuration of additional channels for future integration of other parameters (meteo, etc)

3.2.1.14.- Software for remote access and configuration

3.2.1.15.- Not internal quality control for averaged 1-min values (just admitted for 2, 4 or 8 Hz data)

3.2.1.16.- Software for conversion to ESEOO-XML format (at AEMET or at the station) for automatic integration on Puertos del Estado Data Base and web page, including wave parameters each 20 minutes for those stations providing agitation parameters

3.2.2.- In case of radar sensor, it needs to be fitted to a support arm, that can be locally-manufactured or provided by the maker.

3.2.3.- The contract will include as well as the work of installation, the works of routine maintenance of all the stations during a period of 4 years, in order to get an optimal operation of the sensors and data transmission to the reception centres (AEMET, Puertos del Estado, ANAMS, ONM, INMG, DWR), and guarantee a complete data series of the best quality;

4.- CONDITIONS OF THE LOCATION SITE

4.1.- Minimum requirements:

Before installation there is a need to check the characteristics and adequacy of the location site that should fulfil the following minimum requirements:

4.1.1.- Vertical quay (essential for any radar sensor)

4.1.2.- Minimum depth of 3 meters at low tide (if more, better)

4.1.3.- Old and stable quay or dock on rock (not sediments) is always preferred for long-term measurements (unless it is a very recent harbour),

4.1.4.- Although satellite communication is mandatory, it would be reasonable to have GPRS or internet connection capability nearby for data transmission redundancy. Also possibility of reliable standard power supply is recommended.

4.1.5.- The place should be under surveillance of the local personnel of the harbour, not of common use of the normal public and not close to load/unload of dangerous products or substances. Also the quay at this point should not be of use for boat docking.

4.1.6.- The station should not be exposed to very strong winds and waves

5.- MAINTENANCE AND MONITORING REQUIREMENTS

In order to carry out adequate maintenance of the stations mentioned in this Document of Technical requirements, and prior to their installation, it is important for the Project Management to coordinate with the Countries the appointment of one or more persons responsible for the stations (at least one person from the Meteorological Service and another from the Port Authority for each Country).

The services and supplies corresponding to the various elements within the scope of the contract concerning the sea level stations must meet the technical requirements set out below:

5.1.- General logistics and operation

5.1.1.- Monitoring the measuring point to ensure the continuity and quality of the data:

5.1.1.1.- The Contractor shall be responsible for continuously monitoring the functioning of the sensors and the data capture and transmission system, to ensure its security and to control the quality of the data transmitted. For this purpose, the Contractor will be entitled to access all the data transmitted automatically to the AEMET and Puertos del Estado monitoring centres, whenever transmission is in operation.

5.1.1.2.- Independently of AEMET and Puertos del Estado's own data monitoring and security controls, the Contractor shall be solely responsible for the consequences of failure to carry out this monitoring work, in terms of both repairing damage and the compliance with technical requirements described in this document.

5.1.1.3.- In the event of a data transmission problem, the Contractor should establish whether it was caused by damage to the equipment or by a communication breakdown. To this end, he must take appropriate steps to obtain clarification, either by direct inspection or by requesting information from third parties. Notwithstanding the Contractor's responsibility for extraordinary maintenance work due to natural or accidental causes, in the event of the confirmed loss of the equipment, he must inform the Contract Director immediately, so that efforts to recover or replace it can be coordinated.

5.1.1.4.- The introduction of equipment with new features, or changes in software or sampling periods will not alter these obligations.

5.1.1.5.- The Contractor will establish a daily checking procedure for the data transmitted, in order to take the necessary measures to fulfil the contractual obligations concerning data quality. In the event of any station suffering a temporary break in data transmission for reasons unconnected with the Contractor, he should restore correct functioning with the assistance of third parties, normally Port Authority personnel, by requesting the information needed to ensure the quality of the data.

5.1.2.- Calibration, servicing and adjustment of the equipment, sensors and transmission media

5.1.2.1.- The Contractor shall be responsible for servicing or calibrating the various elements of the tide gauge stations at the required frequency of twice a year, to comply with the manufacturer's recommendations, and whenever incomplete or poor quality records indicate a malfunction.

5.2.- Routine or preventive maintenance

5.2.1.- To ensure that network performance meets the contractual requirements in terms of the quality and continuity of both transmitted and stored recorded data, routine or preventive maintenance shall be defined as all the work, services and supplies needed to maintain the tide gauge stations in the best technical conditions, including each of the elements thereof.

5.2.1.1.- Sensors at the foot of the quay

5.2.1.2.- Transmission means

5.2.1.3.- Receiving stations at the Port Authority

5.2.2.- Preventive maintenance will include the supply and replacement of components of limited durability (if unavailable from the same manufacturer, other components with similar features) and the delivery of raw data collected from the stations in the format specified in this document.

5.2.3.- During the contract period, routine or preventive maintenance will include the following activities.

5.2.4.- Throughout the contract period, each station is to be visited at least every six months for routine maintenance. During these visits, notification of which must be given to the Port Authority, to the designated personnel concerned in each of the recipient countries and to AEMET, the correct functioning of the equipment and transmission systems will be tested by means of the following checks:

5.2.4.1.- The stability of the tide gauge zero: The gauge zero should be determined to a minimum accuracy of 1 cm. This is done by taking simultaneous measurements of the water level, using a perfectly calibrated additional sensor. These will be compared with the measurement taken from the station sensor over at least half a tide cycle (including at least one high tide and one low tide). In addition, manual checks should be carried out using electrical contact tape. The measurement will consist of determining the distance to the water from a point whose level above zero is known to an accuracy of 1 millimeter (the "contact point"). Various measurements should be taken to find an average value and to eliminate the agitation effect. It is advisable to do this at a time when the sea is very calm; however, at certain stations where this is difficult, it is possible to use a calibration tube parallel and similar to the one on the sensor, if this measures within a tube or well. In this case, test measurements should be taken both inside and outside the well, to eliminate the problem of tide time lag. All these measurements should be shown in the routine maintenance reports.

5.2.4.2.- Checking that the benchmarks established close to the tide gauge during its installation are correct.

5.2.4.3.- Leveling the tide gauge benchmark with the "contact point" to an accuracy of 1 mm.

5.2.4.4.- Checking the correct functioning of the tide gauge clock and the computer, if present, located inside the hut or in the Port Authority office. The time should be GMT or solar.

5.2.4.5.- Checking that data is correctly received and recorded in the computer, if any, which will be located inside the hut or in the Port Authority office. If there is no computer, it should also be checked that data recording in the memory unit is proceeding smoothly.

5.2.4.6.- Inspection of the tidal curve recorded in the hours before and after maintenance, to detect any increase in the number of out-of-range peaks or values and to ensure that the station is left in perfect working condition.

5.2.4.7.- If a problem with the tide gauge zero is observed, the Contract Director should be notified immediately, so that, once the causes of the problem have been investigated, he can decide whether or not it would be advisable to change the sensor's reference.

5.2.5.- Monitoring of recorded data, including daily checks on the smooth running of data transmission to Madrid and the quality of the data.

5.2.6.- All maintenance operations are to be documented as set out in **Special Clause, developed in paragraph 5.5 of this document.**

5.2.7.- The cost of consumables needed for these routine maintenance operations will be payable by the contracting company.

5.2.8.- The Contractor shall be liable for any damage to the equipment (which is the property of each country from the time it is received) occurring during routine maintenance operations. Repairs to or replacement of equipment, irrespective of ownership, required as a result of damage occurring during maintenance operations, whether in the course of the necessary work or during handling and transport, will be at the Contractor's expense.

5.2.9.- Logistics associated with this maintenance work shall be entirely at the Contractor's expense, and will include the following items:

5.2.9.1.- Consumables and perishable goods.

5.2.9.2.- Insurance cover for all maintenance operations, including transport.

5.2.9.3.- Transport of both equipment and spare parts, consumables and ancillary items.

5.2.9.4.- Specialist technical staff qualified to carry out the operations, including business expenses, daily subsistence allowances, travel costs, etc.

5.2.10.- Routine or preventive maintenance will include, among others, the following elements:

5.2.10.1.- Ancillary parts, consumables and perishable goods (batteries, hard disks, cables, uninterruptible power supply systems, etc.) required for routine maintenance operations, provided in sufficient quantities and long enough in advance to ensure an adequate level of immediately available stocks. This item will include all procurement, transport, import and customs costs.

5.2.10.2.- Management of the store and inventory of contract equipment stock, keeping an up-to-date record of the condition of the equipment's various sensors and means of transmission, including identification numbers and incident reports (damage, repairs, replacements, items in or out of service, changes of location).

5.2.10.3.- Installation of new software, at the Contract Management's (AEMET) request.

5.2.10.4.- Change in station configuration, as decided by the Contract Director (e.g. frequency of sampling or transmission system).

5.2.10.5.- Preparation of raw data in the required format and its computer-based transmission to AEMET, together with the corresponding report.

5.3.- Extraordinary maintenance due to damage

5.3.1.- Extraordinary maintenance due to damage will be defined as all the work, services and supplies needed to repair damage, faults or breakdowns resulting from any non-accidental causes whatsoever, to any equipment covered by this contract, in order to maintain the network in operation and comply with the contractual requirements to maintain the measuring point and the quality and continuity of the recorded data, both transmitted and stored.

5.3.2.- Except in cases of force majeure agreed with the Contractor, the maximum period for repairing damage will be 10 days from the day on which it occurs (14 days in the case of damage occurring simultaneously at several stations), except when the damage cannot be detected using the daily monitoring mechanisms or by checking information from other sources.

5.3.3.- The contracting company will be responsible for the cost of the consumables required for these extraordinary maintenance operations. The logistics costs associated with this extraordinary maintenance will be payable in full by the contracting company under the same contract conditions as those set out in point 5.2 concerning routine or preventive maintenance.

5.3.4.- If the maintenance operations mentioned under this point are carried out after the maximum period, withholding of payment shall be effected until the work is completed.

5.4.- Extraordinary maintenance due to accidents

5.4.1.- Extraordinary maintenance due to accidents or other causes, not mentioned above, during installation or routine maintenance will be assumed by the tenderer on its own or by means of insurance coverage purchased by it. In any event, the relevant claims must be covered in respect of the following:

- A. Total loss
- B. Theft and robbery, including damage caused in their commission, or as a consequence thereof;
- C. Repairs due to breakdowns and damage due to accidents and natural causes;
- D. Recovery of equipment;
- E. Replacement of equipment lost due to accidents and natural causes or vandalism.
- F. Reinstallation of said equipment at the installation site.

5.4.2.- If the maintenance operations mentioned under this point are carried out after a one month's delay, withholding of payment shall be effected until the work is completed.

5.5.- Special Clause: Monitoring reports and delivery of raw data:

5.5.1.- The Contractor will send AEMET (as Contract Director) routine and specific periodic monitoring reports on the work carried out in connection with all aspects of the monitoring process.

5.5.1.1.- Routine monitoring reports will be four-monthly and will cover the following points:

- Work and actions carried out during the period in question, showing the repairs or renovations carried out by the Contractor in the course of routine or preventive maintenance. The report will include operations sheets showing the checks made to ensure that the equipment is functioning correctly after the work has been carried out. The report will describe how the work was carried out, indicating any incidents and variations with respect to the procedures set out in the contract, and any subcontractors involved.
- Photographs showing the condition of the components and the operations carried out.
- The condition and age of the perishable elements of the station (batteries, etc.).
- The quality of the data transmitted during the period in question within the framework of the Contractor's monitoring procedures, including the detection of any damage to or malfunctioning of sensors, and the remedial measures taken.

These reports must be in AEMET's possession 3 weeks from the end of the four month period.

5.5.1.2.- Specific or extraordinary monitoring reports must be prepared in the case of accidents and serious breakdowns resulting, for example, from a break in data transmission, electricity supply problems, the movement or loss of equipment, changes in location of equipment requested by the Director of the Contract, etc.

In addition to the points set out above for routine maintenance, these specific reports will include expert opinions on the breakdowns and their causes. They will also indicate the measures taken to safeguard the equipment and the time needed to restore it to normal.

5.5.2.- Photographs are to be included in the Contractor's reports, especially in cases where equipment components have been lost or show damage, evidence of knocks, etc.

5.5.3.- Specific reports on sensor calibrations will also be prepared when necessary.

5.5.4.- Raw and processed data concerning the equipment gathered during routine maintenance operations must be delivered to AEMET no later than three (3) weeks from the time the Contractor collects it. Delivery of the data must be computer-based, and include

relevant information concerning the sensor (type and identification number, sampling frequency, etc.).

5.5.5.- The Contractor will also include with the raw data a written report on the status of the data and any problems detected (file errors, data loss, etc.), as well as the remedial measures taken. The Contractor must remedy problems concerning the recording or reading of these data (e.g. dates) before delivering them to AEMET. Reports will be sent via the Project Management, presented on A4 paper (1 copy), and also in computer-based "pdf" format.

5.5.6.- Notwithstanding the above information, the Contractor will officially notify the Contract Director at the earliest opportunity of any relevant incidents in the functioning of the equipment.

6.- ACCEPTANCE / TRAINING AND TAKE OVER

6.1.- Factory Acceptance Test

6.1.1.- The Supplier shall propose and offer Factory Acceptance Test possibility at Supplier's factory prior to deliveries. Factory Acceptance Test procedure document and sheets to be provided at least two weeks prior to Tests upon request by customer. See the *Guide to Meteorological Instruments and Methods of Observation* (WMO-No. 8, Part III) and the *Manual on Sea Level Measurements and Interpretation* (JCOMM Technical Report No. 31 / WMMO TD No. 1339). WMO will send a representative to participate.

6.2.- Training

6.2.1.- The Supplier shall offer the training at its premises after the FAT and before the SAT as follows: one (1) week training for the group of French speaking countries (Mauritania and Senegal) two (2) people from each country and one (1) week training for the group of English speaking countries (Cape Verde and Gambia) two (2) people from each country.

6.3.- Site Acceptance Test

6.3.1.- The Supplier shall propose and offer Site Acceptance Test possibility after the instruments have been installed. See the *Guide to Meteorological Instruments and Methods of Observation* (WMO-No. 8, Part III) and the *Manual on Sea Level Measurements and Interpretation* (JCOMM Technical Report No. 31 / WMMO TD No. 1339). WMO will send a representative to participate.

7.- DOCUMENTATION

7.1.- Equipment/Software Technical Documentation

7.1.1.- The Supplier shall deliver all the cable drawings, installation instructions and User's Guides of all of the equipment and sensors.

7.1.2.- The technical manuals shall include all the information required to the operation, installation, calibration and maintenance of the equipment and system components, and shall cover the following topics:

a) Operation

(as a minimum) equipment general description, power-up procedures, operation procedures, description of the failures that the user could detect by visual inspection.

b) Maintenance

(as a minimum) technical description of each equipment and functional description of each sensor, diagram of the interconnection and cabling between the equipment and guide for failure diagnostic and correction.

c) Installation

(as a minimum) description of the tools set required for each equipment installation, mounting and dismounting procedures, adjustments and calibration procedures.

d) Software

(as a minimum) software operation instructions, procedures of installation, necessary data and parameters loading, logged files accessing and system configuration tools.

APPENDIX 1: DOCUMENTS TO BE PROVIDED WITH THE TENDER REPLY

The offer shall contain the documentation listed in this chapter. The lack of the documentation will be technically assessed as NON FULFILL because of the lack of information providing the necessary elements for the proper evaluation of the proposed system and its supplier.

1. An ISO9001 Quality Assurance System Certificate issued by proper authorities will be considered as an advantage.
2. Description of the Quality Assurance Programs (QAP) used both in design and manufacturing of the offered equipment, including those supplied by a third party.
3. Description of the calibration facilities and internationally traceable standards used in design and manufacturing of the offered equipment.
4. Financial statement of the company from the last three (3) years showing that the annual revenue is at least ten times of the total amount of the offer.
5. Description of at least five (5) similar projects executed during the last five (5) years.
6. All the technical specifications shall be addressed by the Bidder one by one in the form of List of Compliance (LOC) in accordance with the sequence presented above. The compliance must be detailed in technical terms, merely stating 'complied' or 'OK' will not be sufficient reply. General, elusive or vague statements of compliance are not acceptable. The statement shall clearly detail any deviation or exception to the required technical specifications.
7. Wherever necessary, technical information and explanation shall accompany the statement. The supplier should note that in cases where technical information and explanation is vital, the failure to furnish such details in explicit manner may lead to the rejection of the proposal as non-compliance.
8. The Supplier shall present in his proposal, for evaluation by the Contractor, the energy power balance analysis of the Tide Gauge system in order to demonstrate that the batteries and solar panels fulfill the requirements.
9. The Supplier shall include with his offer the description and contact details/reference for the operational AutoTrac systems.
10. To facilitate the process of evaluation documentation should be provided.
11. Complete and accurate data sheets for the offered equipment in French and English.
12. Data sheets will include technical specifications in French and English for the equipment offered and not be simple brochures.
13. Data will be provided in the requested units.
14. Documentation should include as a minimum.
 - Make and model of equipment offered
 - Basic principles of operation
 - As applicable and requested in the spec: Range, Accuracy, resolution, response threshold, response time, Linearity
 - MTBF (or as requested included in the entire calculation of the system)
 - An example of a calibration certificate for the equipment offered, and details of the calibration process to acceptable standards

- Basic non-proprietary mechanical and electrical drawings
15. The bidder shall provide detailed justification for replacement technologies offered, clearly demonstrating equivalence or superior performance and advantages.
 16. The bidder shall provide a Power Budget analysis to demonstrate the effectiveness of the components chosen for the power system –battery, solar panel, regulator – to meet the requirements
 17. The bidder shall provide a detailed training proposal, outlining a syllabus for the training, schedules, and all associated costs.
 18. Full software documentation.

Evaluation criteria

The evaluation criteria will encompass four broad categories: technical, management, business performance and cost. For each category several factors will be used as follows:

Technical

Each proposal will be evaluated for compliance with the specifications, focusing on the proposed system design and technical approach, the system functional performance in terms of data handling and data processing, reliability/maintainability/availability, systems failure/outage recovery and operation, site implementation plans, field support team, and accommodation of future update or growth. Configuration flexibility and openness of the system architecture will be regarded as important requirements. Compliance with the specifications;

Management

Each proposal will be evaluated based on the capabilities of offeror's personnel, the quality and completeness of schedules and plans, the corporate experience, resources and capabilities. The resources, quality, and availability of field system support, qualifications of key concerned personnel, and experience with equipment installation and maintenance in the countries involved in this procurement will also be evaluated. ISO 9001 certification will be considered an advantage. In this case, the bidder shall include copy of the ISO 9001 Certificate and its scope.

Business Performance

Each proposal will be evaluated based on the record of quality products or services, and conformance to specifications; record of problems and effectiveness of corrective actions; adherence to schedules and responsiveness to customer requests; commitment to customer satisfaction, good business practices and integrity.

Cost

The cost proposal must be entirely compatible with the technical proposal. WMO reserves the right to make an award considering any combination of factors provided that it determines that to do so would result in the best value to the concerned WMO Member.

THE UNITED STATES OF AMERICA
DO hereby certify that the following is a true and correct copy of the original as the same appears on the records of the Department of the Interior, Bureau of Land Management, Washington, D. C.

TO ALL WHOM THESE PRESENTS SHALL COME, I GREET YOU IN THE LORD AND IN THE LOVE OF OUR COMMON COUNTRY.

AND WHEREAS the said [Name] has been duly qualified and sworn as a Justice of the Peace for the County of [County Name], State of [State Name];

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