**Maintenance Conditions**

for the

**Procurement of Meteorological Observation Systems**

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# INTRODUCTION

Many NMHS already have template documents to cover all aspects of the procurement of all or part of an Observation Network.

In the absence of these, this document is provided as an example Maintenance Conditions which may be adapted.

Text in red italics should be replaced by information relevant for this Procurement.

The aim of the example documents is to provide guidance. Most NMHS have their own documents/templates/formats should be used for this purpose. These example documents allow a NMHS to check their own documentation against these examples to ensure their Procurement considers the relevant aspects.

These documents have not been checked or approved by WMO legal. They are provided as examples only and should not be used without specific endorsement by the NMHS’s own legal departments.

# Maintenance conditions

## General

The following maintenance levels are distinguished:

### First level maintenance

* daily and weekly checks of the System and System Components by system operators.

### Second level maintenance

* preventive maintenance as required;
* corrective maintenance troubleshooting;
* repair by replacement of defective modules or sub-modules within the System and System Components.

### Third level maintenance

* repair of defective modules or sub-modules of System and System Components by authorised personnel from manufacturer.

### Fourth level maintenance

* repair by the manufacturer.

## Maintainability

The maintenance concept for the System is repair by replacement of Line Replaceable Units (LRUs). The repair of LRUs shall be accomplished by sending defective LRUs to the manufacturer.

## Specific Requirements

1. The Contractor shall guarantee that maintenance of the System and System Components will be carried out in such a way that it will not interfere with the operation of the remaining parts of the System and System Components, nor with maintenance of the other System Components in the System.
2. System Components shall be equipped with protection against hazardous voltages.
3. System Components shall have MTBFs as specified in the Statement of Work.
4. The System and System Components shall be built in a modular way. Replacement, cleaning and/or other maintenance activities of modules shall be easy and fast, with a minimum risk of damage.
5. Test facilities to control the operation of the System and System Components, shall be provided.
6. The time between consecutive maintenance and/or calibration (if applicable) of System Components, shall be at least twenty-six (26) weeks.
7. Sufficient, accurate and reliable control of main functions of System Components shall be possible with field maintenance systems at the sites where the System Components are located for operational purposes.
8. Lightning protection, where applicable, has to meet requirements from local regulations and standards, Contractor to demonstrate.

## Spare Components

The spare components have to be available at least ten (10) years after acceptance of the system. A proposal for spare parts shall be supplied by the Contractor in the Recommended Spare Parts document.

# Contractor Logistic Support

## Definitions

**Preventive maintenance**

User-maintenance, for instance daily and weekly checks of the system with the use of only the on-line tools/software. Special site maintenance and higher preventive maintenance is not foreseen in this project.

**Corrective maintenance**

*Corrective site maintenance*, carried out by specialist personnel, with trouble-shooting as far as defective Line Replaceable Units (LRU) and Repair by Replacement of the defective LRUs. This includes the replacing of chassis level parts, minor assemblies, subassemblies and circuit card assemblies, splicing and patching of cables

*Corrective higher maintenance* with trouble-shooting as far as defective Shop Replaceable Units (SRU) and Repair by Replacement of the defective SRU’s using Automated Test Equipment. Higher maintenance comprises the repair, modify, overhaul, reclaim and/or rebuild of parts, assemblies, subassemblies, components and items. It furthermore comprises of corrective site maintenance beyond the capability of the Purchaser, due to lack of skills, test equipment or special tools.

## Contents of CLS

### Reliability Evaluation

For *reliability* evaluation, the Contractor shall provide reliability block diagrams and mathematical models showing failure rates and redundancies for the main components in an end-item.

The *Contractor* shall furthermore present quantitative values for the reliability parameter: Mean Time Between Failure (MTBF)[[1]](#footnote-1).

### Maintainability Evaluation

For *maintainability* evaluation, the Contractor shall provide to the subsystem level of Mean Time To Repair (MTTR) in man-hours. Specified to the main components of an end-item.

### Recommended Maintenance Plan

Contractor shall make proposals for a Recommended Maintenance Plan for all System Components. The Recommended Maintenance Plan can result in either maintenance activities that can be performed by Purchaser’s personnel, or maintenance activities that have to be performed by especially trained and/or skilled persons other than Purchaser personnel.

Purchaser holds the right to make own arrangements for maintenance contracts other than those proposed by Contractor. In that case Contractor shall be consulted and without reasonable ground, he shall not reject Purchaser’s proposal. Warranty conditions for the System and System Components will not be affected in any way by such arrangements.

The Contractor shall present a Recommended Maintenance Plan. This plan is subject to Purchaser’s review and approval. The Contractor shall use the following items to establish a Recommended Maintenance Plan:

The System shall demonstrate high reliability and require minimal preventive maintenance. The equipment shall meet the reliability and availability figures that are provided in the Requirement Specifications document.

The Recommended Maintenance Plan shall be based on Contractor Logistic Support, which means that the Contractor shall base its Recommended Maintenance Plan on:

* preventive site maintenance that shall be performed by Purchaser’s site personnel and shall be performed without having impact on the operational availability;
* corrective site maintenance up to the level of exchanging LRUs shall be performed by specialist Purchaser’s site personnel;
* corrective higher maintenance shall be performed by Contractor personnel, the Turn Around Time for to be repaired or to be exchanged items shall be 2 months or less;
* faults that endanger the operational availability and that cannot be solved by corrective site maintenance require corrective higher maintenance with on-site intervention of the Contractor, a reaction time of 4 hours during service hours;
* providing emergency telephone maintenance assistance to on-site maintenance activities, during normal office hours of the Contractor;
* the Contractor’s responsibility for supplying the quantity of spare material to meet the requirements of site maintenance and operational availability, and to permanently keep the level of spare material up to the level required;
* a spare parts stock on-site shall ensure a 3-day period of normal operation. This requirement shall be the basis for the level of initial spares starting at PSA.

The Contractor shall guarantee a technical lifetime for the total system of 10 years, starting at the conclusion of FPA. During these 10 years the Contractor shall:

* provide the Purchaser with information about updates on COTS hard- and software products;
* provide the Purchaser on request with information about the impact -functionality, technically and financially- of the above mentioned updates;
* provide the Purchaser with information about the maintainability of the COTS products and suggestions about the premature replacements of COTS products when this could be justified on functional, technical or financial grounds.

The Contractor shall give in his offer a price for the Recommended Maintenance Plan for the whole 10 years starting at FSA. This period of 10 years shall be divided in:

* 2 years’ warranty,
* 2 periods of 3 years, last period of 2 years.

Every period, except warranty, shall be priced individually according to the provided work breakdown structure.

The Contractor shall provide a software warranty period of 2 years, starting at FSA. After the software warranty period software maintenance is required within CLS. This will be based on a response time of 4 hours during service hours (9:00 to 17:00 from Monday to Friday, excluding public holidays). The costs of software maintenance will be based on a fixed annual fee and an hourly fee, the latter depending on the level of expertise of the maintenance engineer that is required (prices to be specified in Pricing document).

1. The MTBF calculations shall be provided by the Contractor. [↑](#footnote-ref-1)