**Training and Documentation**

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 Training and Documentation works 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.

# Training

1.

## General

1. The Contractor shall provide training for Purchaser’s personnel to educate designated operational and technical personnel the appropriate skills to install, operate and maintain the equipment.
2. The Contractor shall provide a training program. The training program shall cover all activities necessary to install, operate, configure and maintain the System and all System Components. The Contractor will propose the contents of the training program.
3. Training courses shall be given in <language> and all Contractor’s instructors shall be fluent in this language. All training material and trainee handbooks shall be in <language>.
4. The Contractor shall prepare and submit training manuals before the training. The Contractor shall submit the training manuals and the proposal of the contents and schedule of the training *at least one (1) month prior* to the start of the training. The Contractor shall supply the necessary hardware and software for the courses in time so that the courses can start on the dates to be agreed upon. If additional facilities are needed to give the courses, Contractor will notify the Purchaser at least one (1) month before the training will be given.
5. The Contractor shall take written and/or practical tests, as appropriate, during or after the training. The Contractor shall provide for each trainee a ‘Certificate of Graduation’. Two (2) copies of each certificate shall be provided to the Purchaser.
6. The Contractor shall provide a time schedule for the training courses, to be approved by the Purchaser.
7.

##  Training categories

Four types of training are required.

1.

### Installation Training

1. Contractor shall provide training for Purchaser’s technicians that will enable them to install all System Components.
2. The training shall supply Purchaser’s technicians with technical background information on all System Components.
3. The training shall supply Purchaser’s technicians with essential information on the functionality and operation of the System Components.
4. The training shall provide a practical part in which Purchaser’s technicians will be trained to completely install and dismantle all System Components.
5. The training shall include training on all diagnostic tools available for all System Components.
6. The training (or parts thereof) will be given with the aid of simulation systems, when applicable.

The number of trainees shall be decided during the project.

### Maintenance Training

1. Contractor shall provide training for Purchaser’s technicians that will enable them to maintain the System Components.
2. The training shall provide a practical part in which Purchaser’s technicians will be trained to completely install and dismantle all System Components and to perform all maintenance activities.
3. The training shall include training on all diagnostic tools and mechanical/software tools that are used to facilitate maintenance of the System Components and to monitor the operational status of the System and System Components.
4. The training (or parts thereof) will be given with the aid of simulation systems, when applicable.

The number of trainees shall be decided during the project.

### System Operator Training

1. Contractor shall provide training for Purchaser’s functional maintenance personnel and system operators that will enable them to perform functional maintenance and configuration of System Components, and to perform system management tasks.
2. The training shall include training on all diagnostic tools available for the functional maintenance and system management tasks of the System and System Components.
3. The training (or parts thereof) will be given with the aid of simulation systems, when applicable.
4. Parts of the configuration of the System for operational purposes shall be realised during and as an essential part of the System Operator Training.

The number of trainees shall be decided during the project.

### 1.3.3 User Training

1. Contractor shall provide training for Purchaser’s users of the Systems and System Components, that will enable them to use the Systems and System Components operationally and produce all output required for operational use.
2. The training shall include training on all diagnostic tools available for operational use of the Systems and System Components.
3. The training (or parts thereof) will be given with the aid of simulation systems, when applicable.

The number of trainees shall be decided during the project.

# Training Schedule

To be proposed by Contractor.

# Documentation

1.

## General

Based on the system specifications and the interface requirements, the Contractor shall produce the final design documents. These documents will be the basis for building the new meteorological network.

Manuals are required for the guidance of personnel, who will install, configure, operate and/or maintain the System and System Components. The information included in each manual shall convey all the information necessary to enable users to readily detect and correct any abnormal situations. The manuals will also serve the purpose of Reference, in which all technical and operational possibilities of System and System Components are described and how the reader can apply them. All manuals shall be written in the <language> language and shall be supplied in hardcopy format as well as in electronic format

All final documentation shall be supplied in hardcopy format as well as in electronic format on USB stick in the following formats:

* **Documents, spreadsheets, presentations:** Microsoft Office 2016, Office 365 or newer (Word, Excel, Powerpoint);
* **Graphs, Drawings:** Microsoft Visio, latest version; AutoCad, latest version.
* **Project Management (Gantt Charts):** Microsoft Project, latest version

## Document categories

### Design Report

The design documents shall contain a detailed descriptions of the whole System and all System Components. These descriptions shall be given in terms of functionality, hardware and software specifications. The design documents shall be submitted to Purchaser for approval and will be the final document stating what goods shall be supplied by the Contractor and agreed upon by the Purchaser

### Installation Manuals

Purchaser’s technicians must be able to install and/or dismantle the System Components. The Installation Manuals shall provide all information necessary to perform these tasks. The manuals shall be written in a clear manner and explain unambiguously what steps to follow to perform installation activities resulting in fault-free System Components. Debugging schemes shall be included.

### System-Operator Manuals

This documentation deals with the instructions and procedures for system -operators to handle System Components and System Parts. The manuals will describe in detail the operational performance and the means of control for the operators, for software as well as hardware components.

### Configuration Manuals

Configuration of System Components shall be an important task in the new meteorological network: it determines the operation of the entire network and of the individual components. The configuration manuals shall contain clear descriptions of how various components of the network have to be configured by persons qualified for these tasks.

### User Manuals

1. The User Manuals consists of a set of documentation starting with a description of the total integrated system. This document provides an overview of the operation of the total system.
2. The next set of manuals to be supplied shall ‘descend’ down to lower levels of System Components.
3. The User Manuals shall contain instructions for users of the System and System Components (hardware and/or software) on how to operate them.
4. The User Manuals shall describe in detail operational performance of the System and the means of control for operators. Additionally, the manuals will provide information on the interpretation of computer-generated diagnostics, analyses, and tools.
5. The User Manuals shall contain detailed descriptions of all software features, menus and graphics.
6. System References shall be included in the manuals.

### Technical Reference Manuals

The Technical Reference Manuals shall describe all System Components in detail and shall at least contain the following information:

1. A general description, including the major electrical characteristics and the equipment’s physical construction and dimensions.
2. A detailed description of the electrical or electronic circuitry and its basic principles of operation; this description should be adequate by including schematic diagrams, presented in a logical order together with tables or other indication of critical voltages (or other parameters) with emphasis on important check-points where and if necessary.
3. Although Installation Manuals have been mentioned separately, they may be considered to be part of the Technical Reference Manuals.
4. Operating instructions and methods for preventive and corrective maintenance to ensure that the equipment can be maintained to the standards that are demanded by the performance specifications of the equipment; a logical step by step process recommended for trouble shooting. The proposed maintenance procedures shall be in agreement with the requested proposal for Maintenance of the integrated meteorological network, which will be given by the Contractor in the Maintenance Conditions, Appendix 10 of the Agreement.

### Software Manuals

<Note that this section is only for software kept in Escrow and/or if the Purchaser will buy/own the software code, with the rights to modify the code.>

The manuals provide complete descriptions and top level flow charts of the software functions and a well commented source codes. The source codes will be used exclusively for operation and maintenance purposes.

### As-Built Drawings

At the completion of the installation of the System and System Components, the Contractor shall supply as-built drawings to the Purchaser. These drawings shall be self-explanatory and independent of other documents. They shall at least indicate

1. Full dimensional details of how all major assemblies of the supplied System Components are physically installed and mechanically and/or electrically integrated.
2. Interconnecting cable layout.
3. Detailed wiring diagrams indicating power, grounding and circuit connections.
4. The title of each drawing and all included text and annotations shall be in <language>.
5. Definitions may be given on the drawing or on a summary sheet at the front of the documents.
6. The number and scale of each drawing shall be clearly indicated, in addition to the issue number of each drawing.
7. All drawing shall at least be of a 1:50 scale.

### Training Manuals

For each part of the System and System Components that requires training before it can be installed, operated, maintained or configured, Training Manuals shall be supplied. The Contractor shall propose the contents of the Training Manuals.

The following quantities of documentation are required:

|  |  |
| --- | --- |
| **Document** | **Quantity** |
| Design Document | Two (2) sets hardcopy, one (1) electronic. |
| Installation Manuals | Three (3) sets hardcopy, one (1) electronic. |
| System Operator Manuals | For each system component, two (2) sets hardcopy, one (1) electronic. |
| System-Configuration Manuals | For each configuration site two (2) sets hardcopy, one (1) electronic. |
| User Manuals | For each user site two (2) sets hardcopy, one (1) electronic. |
| Technical Reference Manuals | At the maintenance department two (2) sets hardcopy, one (1) electronic. |
| Software Manuals | For each user site two (2) sets hardcopy, one (1) electronic. |
| As-Built Drawings | Two (2) sets hardcopy, one (1) electronic. |
| Training Manuals | One for each trainee, one (1) set electronic. |

# Validation of documentation by Purchaser

The Purchaser shall validate all documentation. Contractor will send all documents to the Purchaser to be reviewed within a certain period of time after contract award, mutually agreed upon by Purchaser and Contractor.

# Reproduction

Purchaser reserves the right to reproduce for own use in whole or in part any or all technical publications supplied by the Contractor.

# Review and approval

Upon receipt of the documentation, <x> weeks before the relevant FAT, the Purchaser shall review the documentation for adequacy, completeness and compliance with the requirement specifications. Within thirty (30) days after delivery, the Purchaser shall notify the Contractor of approval, or approval contingent on comment incorporation. Purchaser shall provide the Contractor with a description of necessary changes required for approval. The Purchaser shall supply the description of required changes to the Contractor within thirty (30) days from the date of receipt of the documentation. If no comments are received within thirty (30) days, the documentation shall be considered approved. The Contractor will study the required changes and submit a reaction to the Purchaser within thirty (30) days. After agreement has been reached the Contractor will incorporate the changes.

# Delivery

The Contractor shall *deliver one (1) month before* the SAT or Final SAT all relevant documentation (final versions).