Appendix 3

PART 1
General principles

1. Purpose of the Global Observing System

The purpose of the Global Observing System (GOS) is to provide high-quality standardised observations of the state of the atmosphere and related surface parameters for the preparation of weather analyses, forecasts and warnings in support of the World Weather Watch (WWW) and for other applications under WMO programmes and related environmental programmes of other organisations.

2. Definition of the Global Observing System

2.1 The GOS is the co-ordinated system of standards and procedures for meteorological and associated observations, allowing for world-wide provision and uniform interpretation of the data. The GOS also supports standards for newly developing observing systems and for historical observations.

2.2 The GOS is designed as a feasible response to the requirements of users.
Note: Requirements of users are included in attachment I.

3. Organisation of the Global Observing System

3.1 The GOS provides standards for:

- Observing programmes;
- Networks and configurations of stations:
- Design of stations;
- Observing practices;
- Instrumentation;
- Maintenance of stations.

3.2 Standards can be defined at 3 levels.

- Global standards are agreed at WMO level and form part of the WMO Technical Regulations.
- Regional standards, as agreed by WMO Regional Associations, are applicable within the Region of concern.
- National standards.

3.3 The GOS consists of two subsystems.

- The space-based subsystem is composed of satellite observing systems.
- The surface-based subsystem includes all other observing systems.

4. Implementation of the Global Observing System

4.1 All activities for the implementation of the GOS on the territories of individual countries is the responsibility of the countries concerned.

4.2 As the costs of implementation often are disproportional to the national resources, but also for other reasons, co-operative assistance may be provided through the WMO Voluntary Co-operation Programme (VCP) or other international programmes. Also bilateral or multilateral arrangements may be supportive.

4.3 Implementation of the GOS in areas outside the territories of individual countries should be based on voluntary participation of countries in contributing facilities and services, either individually or jointly.

5. The Manual on GOS

5.1 The global and regional standards for the GOS are laid down in the Manual on GOS, in Volume I and II respectively. The Manual is an annex to the WMO Technical Regulations.

5.2 The scope of the Manual is limited to Regulatory Material. For more extended information, a list of relevant publications is included in Attachment I.

5.3 The attachments to the Manual are not forming a part of annexes to the Technical Regulations.

5.4 The Manual consists of the following Parts:

1. General principles
2. The surface-based subsystem
3. The space-based subsystem

PART II
The surface-based subsystem

1. Stations

1.1 Basic definitions

A Station is a place where meteorological observations are made on a regular basis. The observations may be taken in-situ or remotely, or at (horizontal or vertical) distance.

A Fixed Station is a Station with an invariant location.

A Mobile Station is a Station mounted on a movable carrier (e.g., a ship, aircraft or buoy).

A Surface Station is a Station where observations are made of conditions near (or below) the earth's surface.

An Upper Air Station is a Station where observations are made in the upper air by means of sensors attached to balloons or rockets.

A Radar Station is a Station where weather radar observations are made.

A Wind Profiler Station is a Station where upper wind observations are made by means of a wind profiler.

1.2 Classes of stations

Stations may be classified according to their functionality in following classes.

- Synoptic stations for use in real-time weather analysis and forecasting (including stations providing observations at asynoptic times).
- Climate stations providing information for climatological purposes.
- Atmospheric Composition stations providing information on the chemical composition of the atmosphere.
- Aeronautical stations providing local real-time terminal conditions for aviation.
- Agricultural stations providing local observations for agriculture and agricultural research.
- Nuclear watch stations, providing real-time observations for emergency response to nuclear accidents.
- Special purpose stations, providing information for purposes other than recorded above.

For the latter category, no mandatory criteria are established within the scope of the GOS.

1.3 Requirements for stations

A summary of the requirements to parameters to be observed is recorded in Attachment II.x. It allows for the following definition of levels of performance.

- A Principal Station is a station meeting the target requirements.
- A Basic Station is a station meeting the minimum requirements.

1.4 Information on stations

Members shall inform the WMO Secretariat on relevant information of stations as recorded in Attachment II.z1 (fixed stations) and II.z2 (mobile stations).

Members shall inform the WMO Secretariat on the establishment and closure of stations and on any significant changes at least 6 months before.

Members shall check the contents of Publication No 9, Volume A regularly and inform the WMO Secretariat urgently on necessary corrections.

2. Networks

A network is a configuration of stations, together allowing for analysis of parameter values in 2-, 3- or 4-dimensions.

2.1. GOS Network requirements

2.1.1 Global network requirements for actual weather analysis are the following:

	Spatial resolution	Time resolution
Surface observations	250 km	6 hours
Upper air observations	500 km	12 hours

Note: See also attachment II.1

2.1.2 Global network requirements for climate analysis are the following:

	Spatial resolution	Time resolution
Surface observations	500 km	1 day
Upper air observations	1500 km	1 day

Note: See attachment II.y

2.1.3 Global network requirements for Global Atmospheric Watch are the following:

	Spatial resolution	Time resolution
Observations	5000 km	n/a

Note: See attachment II.x

2.2 GOS Basic Synoptic Network (GBSN)

2.2.1 The GBSN consists of Synoptic Stations providing basic meteorological information on a real-time basis, normally including at least air pressure, air temperature and wind from observations near the earth surface and in the upper air.

2.2.2 The GBSN stations include fixed stations (a defined set of stations at a fixed location) and mobile stations (e.g., ships, aircraft, drifting buoys).

2.2.3 The fixed stations in the GBSN are the stations which compose the Regional Basic Synoptic Networks. In the decision on these networks, the requirements of the GOS shall be observed.

2.2.4 GBSN station selection criteria are recorded in section X.

2.3 GOS Climate Networks

2.3.1 The GCOS Surface Network (GSN) is composed of Climatological Surface Stations with a long historical record and without major changes of the environment over the period of record.

2.3.2 The GCOS Upper Air Network (GUAN) is composed of Synoptic Upper Air Stations with a long historical record.

2.3.3 The selection criteria for the GCOS networks are laid down in section Y.

2.3.4 The Regional Basic Climatological Networks shall comprise the GOS Climate Network stations.

2.4 Global Atmospheric Watch (GAW)

2.4.1 The GAW is designed to include at least 30 stations providing observations of the chemical air composition for global research.

2.5 Selection of stations for networks

2.5.1 Candidate stations shall be selected primarily from Complete Stations of the class concerned, in such a way that the minimum spacing criterion is met. The minimum spacing criterion should be about 50% of the required average spacing.

2.5.2 The network shall be completed by adding Basic Stations, based on the basic spacing criterion, being about 75% of the required average spacing..

2.5.3 Other stations shall not be included.

3. Requirements for sites and observing practices