INTERNATIONAL CIVIL AVIATION ORGANIZATION

WESTERN AND CENTRAL AFRICA OFFICE (WACAF)

ICAO Regional Seminar on ATS/MET/Pilots Coordination

(Yaoundé, Cameroon, 23 – 25 August 2010)

Agenda Item 5: Coordination between ATS units and meteorological offices and stations

COORDINATION BETWEEN ATS UNITS AND METEOROLOGICAL OFFICES AND STATIONS

(Presented by the secretariat)

Summary

This paper addresses the need for guidelines to ensure the necessary coordination between the of air traffic management units and meteorological centres, which could be entered into a letter of formal agreement. A sample letter of agreement between the competent authorities listed in Appendix A to this paper.

REFERENCE

Annex 3 - Meteorological Service for International Air Navigation
Annex 11 - Air Traffic Service
Doc. 4444 - PANS - ATM - Rules of the Air and Air Traffic Services
Doc. 9377 - AN/915 Manual on Coordination between air traffic services, aeronautical information services and weather services.

1 Introduction

1.1 Both ATS units and meteorological offices and stations provide meteorological information for aviation. In many cases the ATS units and the meteorological offices and stations are at the same aerodrome and serve the same aircraft, air routes and/or areas. To achieve the best service for aviation, close coordination of their efforts is necessary, and there is therefore an important need for continuing consultation and coordination between these units, offices and stations at the local level, and for an efficient exchange of information between them.

1.2 The following information and guidance is aimed at improving the coordination between ATS units and meteorological offices and stations, both at the administrative level (i.e. between the ATS authority and the meteorological authority) and at the operational level (i.e. between the ATS units and meteorological offices and stations serving the same aerodrome and the ACCs/FICs and MWOs concerned).

2. Discussion

2.1 At the administrative level, proper coordination can best be achieved by concluding a written Letter of Agreement between the ATS authority and the meteorological authority (see Annex 3, Chapter 4,4.2). Such agreements are especially necessary where the provision of ATS and aeronautical meteorological services are not the responsibility of the same government department. An agreement is a very desirable instrument because:

a) it provides a systematic listing of services and responsibilities which, taking into account the complexity of the subject, can assist greatly in ensuring a complete and efficient meteorological service to air navigation;

b) the meteorological service is often provided by offices and stations of the meteorological authority different from that responsible for the ATS; the preparation of the agreement assists in bringing about a better understanding of the needs and capabilities of the parties involved; and

c) the provision of meteorological service to air navigation may at times involve legal aspects (e.g. during inquiries into incidents or accidents) for which clear and unambiguous allocation of responsibilities is essential.

3. Conclusion

3.1 For the Coordination and harmonization of the provision of services to aircraft, the authorities are urged to consider the conclusion of letters of agreement that identify and define unambiguously the responsibilities of each authority. This is important not only to improve services provided as part of daily activity, but these provisions could also be used in case of aircraft accident or incident legal implication.

3.2 It is recommended that States conclude letters of agreement using **Appendix 2 to Doc. 9377 in Appendix B** of this paper, which clearly and unequivocally defines responsibilities of ATS units and meteorological services for the guidance and harmonization of national and international air navigation services.

APPENDIX A

ATS/MET COORDINATION

1. Indicative Element of the ATS/MET Coordination

1.1 In fact, agreements between the ATS and meteorological authorities concerned are not only desirable and useful but are also explicitly called for in the various Standards and Recommended Practices (SARPs) and Procedures of Annexes 3, 11 and 12 and the PANS-ATM. In some other cases, the need for agreements is strongly justified.

1.2 The Letter of Agreement should normally specify the following:

a) arrangements for meetings, at operational and administrative levels, between the heads of ATS units and meteorological offices and stations to discuss requirements for meteorological information, methods of meeting these requirements and changes in local procedures necessitated by changes in operations. The arrangements should also provide for the involvement, as necessary, of AIS, communications, airport management and operator representatives for coordination purposes;

b) in broad terms the:
   1) requirements for meteorological information;
   2) means to be used for exchanging/supplying that information;
   3) responsibilities and functions of the ATS units and meteorological offices and stations involved; and
   4) designation of the meteorological offices associated with individual ATS units and search and rescue services centres;

c) arrangements for automatic air-reporting (via data link) and manual air-reporting (via voice communications) in the FIRs/control areas concerned, including:
   1) the selection of ATS/MET reporting points;
   2) arrangements for automatic air-reporting, including the climb-out phase of flight (i.e. contracts for ADS/SSR Mode S reports containing meteorological information) and relevant automated dissemination procedures; and
   3) if applicable, designation procedures for air-reporting on air routes with high-density traffic; taking into consideration the relevant provisions in Annex 3, Chapter 5 and Appendix 4, described in 4.2 of this manual;

   Note 1.— The selection of ATS/MET reporting points should be coordinated with the ICAO Regional Office accredited to the State concerned. The list of ATS/MET reporting points should be published in the State's AIP, in accordance with the provisions of Annex 15 and the Aeronautical Information Services Manual *(Doc 8126).*

   Note 2.— Doc 7030 and the relevant ANPs should be also consulted for the procedures regarding air-reporting.

d) where necessary, arrangements regarding the dissemination of information received and/or obtained on pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud, with special emphasis given to information/notifications of these events from non-aeronautical sources and, in the case of FIRs and control areas having active volcanoes, to the arrangements for information from the State vulcanological agency;

Note.— Further guidance is provided in the Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List *(Doc 9766) and the* Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds *(Doc 9691). These documents also apply to e) below.*

e) arrangements between the ATS and meteorological authorities regarding the dissemination of information on the release into the atmosphere of radioactive materials and toxic chemicals;

f) arrangements for the periodic familiarization of ATS, search and rescue, and meteorological personnel with each other's facilities, functions and procedures;

g) where necessary, arrangements for meteorological training of ATS personnel; and

h) arrangements for the provision of aeronautical climatological information to support ATS activities, e.g. development of ATS procedures.

1.3 Details concerning 5.1.5 b) to e) should be discussed, in terms of individual aerodromes or the ATS units and the meteorological offices not located at aerodromes, by representatives of the ATS units and the meteorological offices concerned. Separate agreements should be drawn up as annexes to the overall Letter of Agreement.

1.4 The following items should be covered by these agreements, i.e. annexes to the Letter of Agreement:

a) the information to be supplied routinely by meteorological offices and stations to ATS units, including the format and frequency of the information;

b) the information to be supplied non-routinely by meteorological offices and stations to ATS units (e.g. local special reports, SPECI, SIGMET and AIRMET information, aerodrome and wind shear warnings and alerts), including criteria and local arrangements for the preparation of local special reports and aerodrome, and wind shear warnings and alerts;

c) the transmission of meteorological information in the form of digital data, including WAFS digital grid point data from MET to ATS computers (and vice versa) specifying the sources, formats and volumes of the data, transmission protocols, interfaces, etc.;

d) the provision in ATS units of displays related to integrated automatic systems and the circumstances under which certain meteorological information need not be supplied by the meteorological offices or stations to ATS units (i.e. when the information is independently available at ATS units);

e) instruments/displays connected to the same sensors (e.g. of automatic meteorological observing stations, and RVR systems at ATS units), their use, calibration and maintenance;

f) the making of supplementary (visual) observations by ATS personnel in accordance with the provisions of Annex 3, 4.2 d) (discussed in 4.1.1 and 4.1.2 of this manual) and their supply to meteorological offices and stations;

g) meteorological information obtained in ATS units from aircraft taking off, landing and en route, via voice communications (i.e. routine and special air-reports and non-routine aircraft observations), and relayed to meteorological offices, stations and MWOs;

Note.— Similar arrangements regarding the automatic dissemination of air-reports by data link are dealt with in the agreement between the ATS and MET authorities.

h) provision and use of meteorological information obtained from ground weather radar or from radar used by ATS (if applicable) and from meteorological satellites;

i) dissemination of information obtained on pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud, including volcanic ash advisories;

j) dissemination of tropical cyclone advisories;

k) dissemination and use of information concerning the release into the atmosphere of radioactive materials and toxic chemicals;

l) means to be used for the supply, exchange and dissemination of information under a) and b) and f) to k); and

m) detailed allocation of responsibilities to designated associated meteorological offices and meteorological stations for the supply of information to the ATS units concerned.

1.5 Experience has also shown that the development of additional national guidance material on the coordination between air traffic and meteorological services can help to keep all concerned currently informed of the various procedures and their application.

1.6 A sample Letter of Agreement between an ATS authority and a meteorological authority is given in **Appendix B**.

2 Coordination between TWRs and APPs and their Associated Meteorological Offices and Stations

2.1 The meteorological office(s) and stations associated with a TWR or an APP are responsible for the supply of required meteorological information to these ATS units. The ATS units are responsible for determining what meteorological information shall be transmitted to an aircraft, when and by what means.

2.2 To meet the needs of arriving and departing aircraft, the information given above is to be supplied to TWRs and APPs. If available, weather radar information is also required, particularly when towering cumulus, cumulonimbus and thunderstorms are frequent.

2.3 Coordination between the ATS units and the meteorological offices and stations concerned should take into account the type of air traffic, as well as the availability and use of duplicate meteorological observing instruments and displays of automated meteorological observing stations in these units. Also, agreement should be reached on:

a) the use by ATS personnel of the information obtained from such instruments and displays;

b) the reporting of meteorological phenomena of operational significance, if observed by ATS personnel;

c) the use of reports of non-routine aircraft observations (e.g. on turbulence or wind shear) received from aircraft landing or taking off; and

d) the calibration and maintenance of the meteorological instruments and displays used at these ATS units.

2.4 The meteorological reports required from the relevant aerodrome meteorological station should be supplied promptly. This requires at least a direct telephone line and a direct teleprinter. At many aerodromes use is made of more rapid and automatic means of supplying the information, such as closed-circuit television, local aeronautical computer systems and local area networks. Depending on the size of the aerodrome, the volume of air traffic and the technical means available, much of the information can also be supplied by the use of surface wind, runway visual range, cloud base and atmospheric pressure displays in the ATS units. At aerodromes where traffic levels are high or where there are precision approach operations, use is made of automatic observing

stations or integrated automatic information systems that display, in real time, measured meteorological elements as well as manually inserted meteorological elements which cannot be observed by automatic means. Transmitting local reports from the meteorological station by switchboard telephone often proves to be unsatisfactory and even direct telephone lines involve time-consuming copying of messages and the risk of errors. Special arrangements should be made to ensure the prompt transmission of available weather radar and, if agreed, meteorological satellite information to controller positions, preferably in a format already processed and interpreted, e.g. in chart form. Such information can be displayed at the ATS units separately or on the ATS display at controller positions.

2.5 In cases where an air traffic control unit operates a primary radar but the associated meteorological office does not operate a weather radar, consideration should be given to installing a monitor display in the meteorological office which, preferably, taps the radar signals direct from the antenna prior to their subsequent modification for use in radar control (e.g. modification by moving target indicator (MTI) circuits). When an independent weather radar in the meteorological office or a parallel monitor with the air traffic control radar in the meteorological office is unserviceable, arrangements should be made for the meteorological office to be informed when significant weather echoes are observed on air traffic control radar so that a meteorologist can access this information.

2.6 Even the fastest method of transmitting meteorological information to the ATS units may at times be too slow to permit this information to be kept up to date during rapidly changing weather situations. For these and other reasons (such as the fact that controllers have an unobstructed view of the aerodrome from the control tower), it is essential that appropriate ATS units, in particular TWRs, be able and authorized to carry out the supplementary observing and reporting of meteorological phenomena of operational significance, such as a sudden deterioration in visibility due to the onset of precipitation. The occurrence of low-level wind shear and other significant meteorological phenomena reported by aircraft taking off and landing should also be closely followed by ATS personnel. In addition to transmitting this information immediately to aircraft likely to be affected by it, the ATS unit should also transmit it as soon as possible to its associated meteorological office and station.

2.7 It has already been mentioned that instrument displays for surface wind are required to be available in the appropriate ATS units (Annex 3, Appendix 3, 4.1.2.1). As regards runway visual range and pressure values, Annex 3, Appendix 3, 4.3.3.1 and Annex 3, Appendix 3, 4.7.1 specify that when these elements are determined by instrumental means, displays are required to be located in the appropriate ATS units. Displays of visibility, height of cloud base, and air-temperature and dew-point temperature (Annex 3, Appendix 3) are also desirable.

2.8 Where more than one sensor is used to obtain representative observations of an element (e.g. in the case of multiple-instrument RVR, visibility or anemometer systems), displays deriving data from these sensors, appropriately labelled to identify the sensors to which they relate, should be located in the appropriate ATS unit. The same applies to the information on the remote displays of automatic meteorological observing stations. In addition, the information on controller displays derived from automatic meteorological observing stations should be the full information available as displayed in the local meteorological station or an agreed subset thereof.

2.9 If a local ATS unit is equipped with a surface wind remote-sensing display, that instrument should show wind direction in degrees magnetic and the mean wind speed and direction averaged over two minutes as well as the wind speed variations indicated during the previous ten minutes. For wind observations reported by the meteorological station at the aerodrome, it should be noted that the wind direction is given in degrees true and must therefore be converted at the ATS unit into degrees magnetic before transmission to departing and arriving aircraft. In METAR and SPECI, including those for VOLMET broadcast, the surface wind observations are averaged over ten minutes, except when the ten-minute period includes a marked discontinuity in the wind direction and/or speed.

Note.— For details concerning surface wind reporting, see Annex 3, Chapter 4, 4.6.1 and Appendix 3, 4.1.

2.10 At many aerodromes, meteorological information for aircraft approaching and landing is transmitted, together with operational data, by means of D-ATIS or ATIS broadcasts. The specifications for such services are contained in Annex 11. Agreements between the local meteorological stations and the ATS units should, in those cases, deal also with the provision of the meteorological information required for these services and the methods of keeping it up to date. In the case of ATIS, information from the local meteorological report is used, and hence the surface wind observations contained in these broadcasts are averaged over two minutes. The surface wind direction values broadcast through ATIS should be given in degrees magnetic.

3 Coordination between ACCs/FICs and the Associated MWOs

3.1 The meteorological information required by ACCs/FICs from the associated MWOs normally comprises the information given in Chapter 3, 3.4 and, in particular, 3.4.1. Where available, weather radar or composite weather radar and, if agreed, meteorological satellite information should also be supplied to ACCs/FICs.

3.2 Reliable telecommunications facilities between ACCs/FICs and the associated MWOs are essential. The facilities required comprise a direct telephone line and printed and/or video display communications. Depending on the volume of traffic, the needs of the ACCs/FICs concerned and the technical means available, meteorological information can also be supplied to the ACCs/FICs through:

a) exchanges between national ATS and meteorological computerized information systems, including national OPMET data banks;

b) local aeronautical computer systems using local area networks;

c) closed-circuit television;

d) facsimile transmission; or

e) direct access through AFTN to international OPMET data exchange systems, or international OPMET data banks. Weather radar and meteorological satellite information is relayed, as necessary, to ACCs/FICs.

3.3 Difficulties sometimes arise when an aircraft requests non-routine information, e.g. concerning a distant aerodrome. The MWO concerned should be on the alert for such non-routine requests and take action within the meteorological office as necessary to provide a timely reply.

3.4 Proper coordination between ACCs/FICs and the associated MWOs should also include clearly stated and agreed upon procedures for the handling of air-reports.

3.5 Close coordination is also required between the associated MWOs and ACCs/FICs and the AIS units concerned to ensure that information on volcanic ash provided in SIGMET and ASHTAM/NOTAM is consistent. In particular, information received from vulcanological agencies should be exchanged without delay between the MWOs, ACCs/FICs and AIS units.

3.6 If the MWOs associated with the ACCs/FICs concerned are required to be involved in the exchange/dissemination of information concerning a release into the atmosphere of radioactive materials or toxic chemicals following a nuclear or chemical accident, the necessary coordination measures should be developed to cover these emergencies.

3.7 It is not uncommon to assign meteorologists to work in ATS units handling large numbers of aircraft movements or to be available at certain meteorological centres as coordinators for such ATS

units (e.g. ACCs, FICs and air traffic flow management centres (ATFMCs)) and the associated MWOs. These meteorologists have immediate access to up-to-date meteorological information in the area for which the ATS unit is responsible, particularly weather radar data, satellite data, actual and forecast meteorological charts and all relevant air-reports. This information enables them to provide instantaneous advice and warnings to controllers, permitting the latter to make maximum use of meteorological data in controlling/informing aircraft or assisting in traffic flow management, with the minimum of distraction from their tasks.

APPENDIX B

SAMPLE LETTER OF AGREEMENT BETWEEN THE ATS AND METEOROLOGICAL AUTHORITIES

Directives for the coordination between ATS and the meteorological offices and stations and responsibility for the provision of meteorological service for international and national air navigation

Effective date: . . . . . .

1. OBJECTIVE

1.1 The objective of this Letter of Agreement between [the ATS authority][1] and [the meteorological authority][2] is to establish the directives for the necessary coordination between ATS units and meteorological offices and stations to ensure the provision of the meteorological service required for civil (international and national) air navigation, in accordance with international agreements (see 1.4) and [national air navigation regulatory documents].

1.2 This Letter of Agreement also specifies the responsibility of ATS units in relation to the transmission to meteorological offices and stations of air-reports and other meteorological information obtained from aircraft in flight or resulting from observations made by ATS personnel at aerodromes.

1.3 This Letter of Agreement also includes the responsibilities of ATS units and meteorological offices and stations in relation to the mutual exchange of information on pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud, and information on the release into the atmosphere of radioactive materials and toxic chemicals [if applicable].

1.4 The directives detailed in this document are in accordance with the Standards and Recommended Practices and Procedures of ICAO, contained in Annex 3 — *Meteorological Service for International Air Navigation*, Annex 11 — *Air Traffic Services*, Annex 12 — *Search and Rescue*, Annex 15 — *Aeronautical Information Services* and in the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444), as well as the provisions contained in the *Regional Supplementary Procedures* (Doc 7030), relevant regional air navigation plans and in the aeronautical information publication of [name of State] (AIP-[name of State]). These directives are also based on the guidance material in the *Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services* (Doc 9377), the *Aeronautical Information Services Manual* (Doc 8126) and the *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List* (Doc 9766).

[1] Name of the ATS authority.
[2] Name of the meteorological authority.

1.5 This Letter of Agreement includes ..... [3] Annexes, including detailed directives and arrangements pertaining to individual aerodromes and to ATS units and meteorological offices not located at aerodromes.

2. REVISIONS

2.1 When, for special or unforeseen reasons, a significant change in the coordination between the two parties involved or the services mentioned in this Letter of Agreement becomes necessary, the respective officers-in-charge, through mutual agreement, may effect temporary changes or amendments, provided that these changes are not intended to last more than ..... [4] days.

2.2 Permanent revisions to this Letter of Agreement may be made by the authorities who approve and sign this agreement. A complete cancellation of this Letter of Agreement may be made, in writing, by the parties to the agreement within a notice period of ..... [5] days.

3. GENERAL

3.1 The objective of meteorological service is to contribute to the safety, regularity and efficiency of civil air navigation.

3.2 [The meteorological authority] has responsibility for executing and coordinating activities to meet the meteorological requirements necessary for civil air navigation in [the Contracting State concerned].

3.3 On the basis of the decision [reference] by [the Contracting State concerned], [the meteorological authority] establishes an adequate number of meteorological offices and stations to meet the relevant requirements for the provision of meteorological service for civil air navigation.

3.4 The aeronautical meteorological service provided by these offices and stations to ATS units comprises:

a) meteorological stations making routine and special observations and issuing local routine and special reports and METAR and SPECI. In addition, these stations make non-routine observations and prepare volcanic activity reports [if applicable];

b) meteorological offices and/or aerodrome meteorological offices providing forecasts for aerodromes (such as TAF and trend forecasts, relevant warnings for aerodromes and their vicinity), as well as forecasts of en-route weather conditions, meteorological consultation, flight briefings and documentation; and

c) a meteorological watch office (the ..... MWO), providing meteorological watch for the ..... FIR/UIR established in [the Contracting State concerned], including the preparation, issuance and dissemination of SIGMET information and AIRMET information [if applicable] concerning specified en-route weather phenomena which may affect the safety of aircraft operations.

[3]. Number of annexes agreed upon by the two parties to the Letter of Agreement.
[4]. Figure to be agreed upon locally; six days appears to be a suitable period.
[5]. Figure to be agreed locally; 180 days appears to be a suitable period.

3.5 The objectives of ATS are to:

a) prevent collisions between aircraft in the air or on the manoeuvring area of an aerodrome;

b) prevent collisions between aircraft on the manoeuvring area and obstructions on that area;

c) expedite and maintain an orderly flow of air traffic;

d) provide advice and information useful for the safe and efficient conduct of flights; and

e) notify appropriate organizations regarding aircraft in need of search and rescue aid and assist such organizations as required.

3.6 ATS comprises three services, as follows:

a) air traffic control service;

b) flight information service; and

c) alerting service.

3.7 The air traffic control service includes the provision of:

a) air traffic control service for controlled flights, except for those parts of such flights provided within the approach control service and the aerodrome control service;

b) approach control service to that portion of controlled flights associated with the arrival of an aircraft at, or its departure from, the various controlled aerodromes; and

c) aerodrome control service for aerodrome traffic, except for those parts of flights provided within approach control service.

3.8 The flight information service provides advice and information useful for the safe and efficient conduct of flights.

3.9 The alerting service notifies the appropriate organizations regarding aircraft in need of search and rescue aid and assists such organizations as required.

Note.— The established FIR/UIR and control area6 and the related FIC/ACC, as well as the established TWRs and APPs, are given in the AIP, GEN 3.3, of [the Contracting State concerned].

4. RESPONSIBILITIES

4.1 General

In order to provide an efficient air traffic service and in view of the fact that the ATS units are an important factor in the liaison between aircraft in flight and the meteorological offices and stations, [the meteorological authority] and [the ATS authority] will collaborate to ensure a fast and efficient coordination.

[6]. It is assumed that the Contracting State concerned has established in its airspace one FIR/UIR and one control area within the FIR/UIR. The required ATS is provided from one FIC/ACC which is served by one MWO.

4.2 Responsibilities of [the meteorological authority] and the meteorological offices and stations

General

4.2.1 [The meteorological authority], through the meteorological offices and aeronautical meteorological stations listed in Table A2-1, is responsible for the provision of up-to-date information on existing and forecast meteorological conditions to those ATS units that need it in order to carry out their functions. The necessary meteorological information will be supplied to individual ATS units from the associated meteorological offices and relevant meteorological stations at aerodromes. Table A2-2 provides a list of the associated meteorological offices designated by [the meteorological authority] to serve individual ATS units and rescue coordination centres and sub-centres.

4.2.2 Meteorological offices will be located, or suitable arrangements will be made, so that meteorological briefings for ATS personnel, as well as consultations between meteorological and ATS personnel, are facilitated and fast and reliable communications are established in order to effect coordination in the most efficient manner possible.

4.2.3 The meteorological information provided will, as far as possible, be in a format that facilitates easy interpretation by ATS personnel, and the frequency of meteorological reports, forecasts, warnings, etc., will cover the needs of each of the ATS units. Table A2-3 provides a list of meteorological information to be supplied to ATS units, its format and the frequency with which it is to be supplied to individual ATS units.

4.2.4 In providing local reports and current altimeter setting information to ATS units at aerodromes, consideration will be given to the type and volume of air traffic and the availability of meteorological instruments/displays and/or automated observing system displays in the units concerned.

Table A2-1. List of meteorological offices and aeronautical stations providing meteorological service to civil aviation

Office	*Located at*	*Location indicator*
Aerodrome meteorological office	Donlon International	YUDL
Aerodrome meteorological office	Kental Aerodrome	YUDK
Meteorological watch office	Donlon (City)	YUDD

Aeronautical meteorological station at	*Location indicator*
Donlon International	YUDL
Donlon West	YUDW
Biggin	YUDB
Gales	YUDG
Kental	YUDK
Tursa	YUDT

Note.— All names, locations and location indicators are fictitious. Appendix 2 A2-5

Table A2-2. Designation of meteorological offices associated with individual ATS units and search and rescue services centres

Aerodrome	*ATS unit*	*Meteorological office associated with the ATS unit*
Donlon International	TWR	Donlon International
Donlon International	APP	Donlon International
Donlon West	TWR	Donlon International
Biggin	TWR	Donlon International
Biggin	APP	Donlon International
Gales	TWR	Donlon International
Kental	TWR	Kental
Kental	APP	Kental
Tursa	TWR	Kental
	ACC/FIC Donlon	CVM Donlon
	RCC/RCS Donlon	CVM Donlon

Note.— All locations are fictitious.

4.2.5 Detailed information on the location, vertical extent, direction and speed of movement of significant meteorological phenomena in the proximity of aerodromes, which may present a danger to aircraft operations, particularly in the areas of the initial climb-out and approach, will be provided to the appropriate ATS units with the utmost speed. This information will be derived from weather radar observations, remote-sensing equipment and meteorological satellite data available in [the meteorological authority].

4.2.6 Meteorological offices and/or meteorological stations will provide other information as agreed locally concerning, for example, surface wind, rapid deterioration of weather conditions or sudden fluctuations of temperatures that could adversely affect the operation of certain types of aircraft, either en route or on take-off and landing.

4.2.7 Meteorological offices will provide the meteorological information needed to meet non-routine requests from aircraft in flight (e.g. requests from distant aerodromes for meteorological reports).

4.2.8 Computer-processed meteorological information in digital form will be provided to ATS computerized centres in accordance with the arrangements agreed between [the meteorological authority] and [the ATS authority] concerning its content, format and transmission. Details of these arrangements are specified in [relevant Annexes to this Letter of Agreement].

4.2.9 Copies of meteorological flight documentation supplied to flight crews will be kept for a period of at least 30 days (i.e. stored as hard copies or in computer memory), from the date of issue and will be made available on request for inquiries or investigations and, for these purposes, will be retained until the inquiry or investigation is completed.

Table A2-3. Aeronautical meteorological information supplied to ATS units

Information	***Distributor***	***Destination***	***Communications Means***	***Fréquency***
METAR et MET REPORT with trend forecast*, as required	Aeronautical MET station [trend forecast prepared by MET office	TWR APP ACC FIC COM Station	Note 1 Note 1 Note 1 Note 1 Note 2	Hourly**
SPECI et SPECIAL with trend forecast*, as required	Aeronautical MET station [trend forecast prepared by MET office]	TWR APP ACC FIC COM Station	Note 1 Note 1 Note 2 Note 2 Note 2	When warranted
TAF	MET office	TWR APP ACC FIC COM Station	Note 1 Note 1 Note 1 ou 2 Note 1 ou 2 Note 2	Every 3 or 6 hour
Aerodrome warnings .	MET office	TWR APP COM station Aerodrome services	Note 1 Note 1 ou 2 Note 2	When warranted

** Trend forecasts to be added to local reports and METAR/SPECI for those stations so identified in the air navigation plan.*

*** Or half-hourly if so decided by regional air navigation agreement.*

Note 1.— Communications by intranet, closed-circuit TV, video display unit, or similar. If none of these are available, or during unserviceability periods, communications by phone, followed if possible by confirmation by other means.

Note 2.— Communications by teleprinter.

Renseignements à fournir	***Fournisseur***	***Destination***	***Moyen de Communications***	***Fréquence***
Upper wind and temperature forecasts	MET office and/or MWO (data to be obtained through the WAFS)	ACC FIC	Note 2 Note 2	Every 6 hours (if required
Significant en-route weather forecast	MET office and/or MWO (data to be obtained through the WAFS)	ACC FIC	Note 2 Note 2	Every 6 hours
SIGMET and AIRMET	MWO	TWR APP ACC FIC Station COM	Note 1 Note 1 et 2 Note 1 et 2 Note 1 et 2 Note 2	When warranted
Wind shear warnings and alerts	MET office	TWR APP	Note 1 Note 1	When warranted
Avis de cyclone tropical	TCAC/MWO	ACC FIC	Notes 1 et 2	When warranted
Tropical cyclone advisory	VAAC/MWO	ACC/FIC	Notes 1 et 2	When warranted
Information on accidental release of radioactive material, i.e. location of the accident and forecast trajectories of the radioactive material	MWO (normally, the information obtained from the WMO RMSC concerned	ACC/FIC	Notes 1 et 2	When warranted
Information on volcanic eruptions and volcanic ash for which a SIGMET has not yet been issued.	CVM VAAC	TWR APP ACC FIC	Notes 1 et 2	When warranted

4.2.10 Aeronautical climatological information (i.e. in particular, aerodrome climatological tables and summaries) will be provided to [the ATS authority] as agreed between the two parties to this Letter of Agreement.

Information for aerodrome control towers (TWRs)

4.2.11 Up-to-date local reports with trend forecasts, including current pressure data for the setting of altimeters, and TAF, related to the aerodrome concerned, will be provided to the aerodrome control tower of each aerodrome.

4.2.12 Local special reports with trend forecasts, including current pressure data for the setting of altimeters, issued in accordance with Annex 3, Chapter 4, 4.4, and the list of criteria for special observations referred to in Annex 3, Appendix 3, 2.3, and amendments to TAF will be communicated to the TWR in accordance with locally established procedures as soon as they are issued, i.e. without waiting for the next local routine report or forecast.

4.2.13 Aerodrome warnings issued in accordance with Annex 3, Chapter 7, 7.3 and Appendix 5, 5 and 6, and the list of criteria for the issuance of these warnings in Annex 3, Appendix 6, 5.2, wind shear warnings and alerts and relevant SIGMET information and AIRMET information [if appropriate] will be communicated to the TWR without delay.

4.2.14 TWRs will be equipped with displays for surface wind and runway visual range (RVR), [other meteorological elements/phenomena, as appropriate]. The displays will relate to the same points of observation and will obtain data from the same sensors as those to which the corresponding displays in the meteorological station are connected.

4.2.15 Local special reports will not be issued for changes in values of meteorological elements displayed continuously at TWRs (as per 4.2.14).

4.2.16 Information received on pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud, for which SIGMET information has not been issued, will be communicated to individual TWRs by their associated meteorological offices [if applicable].

Note.— Annexes ..... to this Letter of Agreement include detailed arrangements relating to TWRs at [list of aerodromes].

Information for approach control offices (APPs)

4.2.17 Up-to-date local reports with trend forecasts, including current pressure data for the setting of altimeters, and TAF related to the aerodromes concerned will be provided to the ATS units that provide approach control services.

4.2.18 Local special reports with trend forecasts, including current pressure data for the setting of altimeters, and amendments to TAF will be communicated to APPs, in accordance with locally established procedures, as soon as they are issued (i.e. without waiting for the next local routine report or forecast).

4.2.19 Relevant SIGMET information and appropriate special air-reports, AIRMET information [if appropriate], aerodrome warnings and wind shear warnings and alerts will be provided to APPs without delay.

4.2.20 APPs providing the service for final approach, landing and take-off will be equipped with displays for surface wind, RVR and atmospheric pressure, [other meteorological elements/phenomena, as appropriate]. The displays will relate to the same points of observation and will obtain data from the same sensors as those to which the corresponding displays in the meteorological station are connected.

4.2.21 Local special reports will not be issued for changes in values of meteorological elements displayed continuously at APPs (as per 4.2.20).

4.2.22 Information received on pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud, for which SIGMET information has not been issued, will be communicated to individual APPs by their associated meteorological offices [if applicable].

Note.— Annexes ..... to this Letter of Agreement include detailed arrangements relating to APPs at [APP's location or location indicators].

Information for the [location or location indicators] area control centre/flight information centre (ACC/FIC)

4.2.23 Up-to-date routine and special reports (METAR and SPECI with TREND forecasts) and TAF related to aerodromes located within the ..... FIR/UIR, as well as other forecasts for the airspace for which the ..... ACC/FIC are responsible, will be provided to these centres, giving special emphasis to significant meteorological conditions and weather deterioration occurring, as soon as it can be determined. Such reports and forecasts will also relate to all other areas that may be determined on the basis of regional air navigation agreement.

4.2.24 SIGMET information and appropriate special air-reports and AIRMET information [if appropriate] pertaining to the ..... FIR/UIR, and also to those FIRs/UIRs or portions of FIRs/UIRs which lie within two hours' flying time from the boundaries of the ..... FIR/UIR, will be provided to the ..... ACC/FIC.

4.2.25 Current pressure data for setting altimeters [e.g. the lowest QNH in the FIR specified by the FIC/ACC] will be provided to the ..... ACC/FIC to be available for low-level flight operations.

4.2.26 Information received on pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud, for which SIGMET information has not been issued, will be communicated to the ..... ACC/FIC by the ..... MWO [if applicable].

4.2.27 Volcanic ash advisories will be communicated to the ..... FIC/ACC in accordance with regional air navigation agreement.

4.2.28 Information received from [the designated national and/or international sources] concerning the release into the atmosphere of radioactive materials and toxic chemicals will be communicated to the ..... ACC/FIC by the ..... MWO.

Note.— Annex ..... to this Letter of Agreement includes detailed arrangements relating to the ..... ACC/FIC.

4.3 Responsibilities of [the ATS authority] and ATS units

4.3.1 [The ATS authority] makes the necessary arrangements for ATS units to:

a) transmit routine and special air-reports received by voice communications to the ..... MWO;

b) automatically transmit routine air-reports by data link communications to WAFCs London and Washington;

c) automatically transmit special air-reports received by data link communications to the ..... MWO, WAFCs London and Washington. The special air-reports will be transmitted without delay and the routine air-reports will be transmitted as soon as practicable.

4.3.2 Reports of non-routine observations from aircraft in flight (Annex 3, 5.6 refers) will be transmitted without delay to the ..... MWO and meteorological offices and stations concerned. (Annex 11, 2.20.1 a) and b) refer.)

4.3.3 [The ATS authority], in coordination with [the meteorological authority], establishes a list of ATS/MET reporting points, coordinates the list with the ICAO Regional Office ..... and submits the list to the AIS office concerned for inclusion in the aeronautical information publication of [the State concerned].

4.3.4 Supplementary meteorological observations made by personnel in local ATS units, as well as the meteorological information that the meteorological offices and stations have requested them to obtain will be supplied without delay to the meteorological offices and stations concerned.

4.3.5 Meteorological information obtained from ATS radar will be provided to meteorological offices and stations whenever necessary and feasible and, in particular, when information from weather radar is not available. This information should be relayed to the associated meteorological offices and stations as soon as possible and should contain the time of observation, location, extent, distance and intensity of the identified significant weather areas. In this regard, it is recognized that it is not mandatory for radar controllers to maintain watch over significant weather areas [if applicable].

4.3.6 ATS units will transmit to the associated meteorological offices and to the ..... MWO, as appropriate (and to the ..... VAAC [if so agreed with the VAAC]), without delay, information received on pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud for which SIGMET information has not been issued. (Annex 11, 2.20.1 c) refers) [if applicable.]

4.3.7 Within the frame of the FIS, relevant ATS units will transmit to aircraft pertinent:

a) SIGMET information up to a distance normally corresponding to two hours' flying time and appropriate special air-reports for which SIGMET information has not been issued. The transmission to aircraft of such air-reports will continue for ..... from the time of issuance of the respective air-reports;

b) AIRMET information [if appropriate] up to a distance of ..... hours' flying time;

c) information concerning pre-eruption volcanic activity, volcanic eruptions and volcanic ash clouds received from [the sources specified in arrangements developed by the ATS, AIS, vulcanological and meteorological authorities in the State concerned] until the respective SIGMET and/or ASHTAM or NOTAM are issued [if applicable];

d) information received from [the source designated in the State concerned] concerning the release into the atmosphere of radioactive materials or toxic chemicals, in accordance with arrangements developed by [the ATS and AIS authorities] in coordination with the meteorological authority [if applicable]; and

e) as necessary, weather conditions at departure, destination and alternate aerodromes reported in relevant METAR and SPECI, with TREND forecasts and TAF.

5. DISSEMINATION OF METEOROLOGICAL INFORMATION

5.1 Bearing in mind that meteorological information is of vital importance to the safety of aircraft in flight, it is necessary that the units providing ATS always keep aircraft informed of the current weather conditions. Table A2-3 outlines the requirements for supplying aeronautical meteorological information to the various ATS units as well as the means of communication to be utilized so that this information reaches the ATS units in good time.

6. ATS UNITS AND METEOROLOGICAL OFFICES AND STATIONS — COORDINATION MEETINGS

6.1 Regular and/or ad hoc coordination meetings between the chiefs of the ATS units and chiefs of meteorological offices and stations, and other interested parties, aimed at improving the services provided to aircraft, will be convened as appropriate and at least every ..... months.

7. COURSES FOR METEOROLOGISTS AND AIR TRAFFIC CONTROLLERS

7.1 Courses or on-the-job training for meteorological and ATS personnel will be organized periodically with the objective of familiarizing them with the activities performed by both services.

7.2 Periods and dates for these courses will be agreed by [the ATS authority] and [the meteorological authority] taking into account the availability of personnel and the necessary equipment.
