**AERODROME METEOROLOGICAL OBSERVING SYSTEMS STUDY GROUP (AMOSSG) — SECOND MEETING**

De Bilt, 20 to 23 February 2001

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# SUMMARY OF DISCUSSIONS

## 1. HISTORICAL

1.1 The second meeting of the Aerodrome Meteorological Observing Systems Study Group (AMOSSG) was held at the Royal Netherlands Meteorological Institute (KNMI), de Bilt, the Netherlands, from 20 to 23 February 2001.

1.2 The opening of the meeting was attended by Professor Dr. J. de Jongh, the Director of the KNMI, and by Dr. L. Hafkenscheid, the Head of the Observations and Modelling Department. In his opening address, Professor Dr. J. de Jongh emphasized the crucial role the AMOSSG was playing in updating the provisions related to aerodrome observations and reports, in time for the upcoming Meteorology Divisional Meeting, planned to be held in 2002.

1.3 The names and addresses of the participants are listed in Appendix A.

1.4 Ms. Joanne St-Coeur was elected Chairman of the meeting.

1.5 The meeting considered the following items:

**Agenda Item** 1. Opening of the meeting

**Agenda Item** 2. Election of Chairman

**Agenda Item** 3. Adoption of working arrangements

**Agenda Item** 4. Adoption of the agenda

**Agenda Item** 5. Review of the requirements for meteorological observations and reports at aerodromes contained in Chapter 4 to Annex 3

**Agenda Item** 6. Assessment of the current capability of automatic weather observing systems to meet the expected future requirements

**Agenda Item** 7. Development of guidance material on automatic weather observing systems

**Agenda Item** 8. Consideration of the inclusion of modern observing techniques (e.g. remote sensing) in Annex 3

**Agenda Item** 9. Future work programme of the group

**Agenda Item** 10. Any other business.

A list of study notes and information papers issued for the meeting of the groups is given at Appendix B to this summary of discussions.

1.6 The group was given a series of presentations on automated systems which were being tested or used in the Netherlands by the staff of the KNMI (Mr. W. Wauben: Automated visual observations for SYNOPs; Mr. A. van Lammeren: Synergetic cloud algorithm and current cloud remote sensing research; Mr. J. van der Meulen: Exploratory actions on automatic present weather observations (Eumetnet project); and Mr. A. Jacobs: The ability to produce TRENDs from NWP model data and observations).

## 2. AGENDA ITEM 1: OPENING OF THE MEETING
## AGENDA ITEM 2: ELECTION OF CHAIRMAN
## AGENDA ITEM 3: ADOPTION OF WORKING ARRANGEMENTS
## AGENDA ITEM 4: ADOPTION OF THE AGENDA

2.1 These items are covered under section 1: Historical.

## 3. AGENDA ITEM 5: REVIEW OF THE REQUIREMENTS FOR METEOROLOGICAL OBSERVATIONS AND REPORTS AT AERODROMES CONTAINED IN CHAPTER 4 TO ANNEX 3

### 3.1 Introduction

3.1.1 The group recalled that one of the main tasks of the AMOSSG was to review the requirements for meteorological observations and reports at aerodromes contained in Annex 3 — *Meteorological Service for International Air Navigation*, Chapter 4 and that a preliminary review of these provisions had been undertaken by the group at its first meeting. Based on the comments made, the Secretary had prepared an updated draft version of Annex 3, Chapter 4 for revision by the AMOSSG/2 Meeting. In this context, a special effort to improve the clarity of the provisions had been made.

3.1.2 Before reviewing the draft version of Annex 3, Chapter 4, Wil informed the group about the work being undertaken by the European Air Navigation Planning Group (EANPG) and its sub-groups and project teams. He singled out a number of issues under consideration in the European (EUR) Region which were closely related to the work being progressed by the AMOSSG. The group took note of these regional developments; however, it was realized that only those proposals which would be of a world-wide scope and which had first been endorsed by the EANPG would subsequently be referred by the ICAO Secretariat to the AMOSSG for further consideration. It was agreed that the few issues that were of this nature would be addressed under the future work programme.

### 3.2 General features

3.2.1 Next the group undertook a thorough revision of the draft version of Annex 3, Chapter 4. The results of this review is at Appendix C to this summary. The group suggested that a number of provisions should be upgraded to standards in view of their maturity and importance to safety.

3.2.2 It was noted that new sub-headings had been introduced; for purposes of clarity but these would not be retained in Annex 3. However, the group noted that a proposal to split Annex 3 into “core standards and Recommended Practices (SARPs)” and “technical specifications” would be considered by

the Meteorology (MET) Divisional Meeting (2002) and if endorsed, the sub-headings would be re-introduced for the part including technical specifications. Furthermore, the draft Chapter 4 included an initial proposal how to split Sections 4.5 to 4.12 into core SARPs and technical specifications: the requirement to observe and report a parameter, including the units of measurement to be used, and the requirements for representativeness would be left in the part containing the core SARPs while all the rest (e.g. siting, displays, averaging and reporting) would be transferred to technical specifications.

3.2.3 The proposal also attempted to clarify the provisions related to reporting. Under each parameter, these provisions were presented in the following order: first, those applicable to both local routine and special reports and reports in the METAR/SPECI code forms; secondly, those applicable only to local routine and special reports and lastly, those applicable exclusively to reports in the METAR/SPECI code forms. Any provision dealing with purely the reporting format and which had been rendered redundant as a result of the introduction of the templates were proposed for deletion.

3.2.4 The group realized that the draft chapter included a wealth of amendments but that most of them were of an editorial nature and did not need to be addressed in this summary. The following issues, however, were considered to be of some substance and are, therefore, addressed below:

3.3 **Aeronautical meteorological stations and observations**

3.3.1 **Paragraphs 4.1.8 and 4.1.9.** Since displays for temperature and pressure were widely used, it was agreed that they should be included in the Annex 3 provisions. The requirement for the inclusion of back-up procedures in the design of integrated automatic systems was also incorporated in 4.1.8 and 4.1.9.

3.4 **Surface wind**

3.4.1 **Section 4.5.** It was noted that the provisions related to the reporting of variations from the mean wind direction and speed had been totally reorganized for clarity (paragraphs 4.5.8 to 4.5.10 refer).

3.4.2 **Paragraph 4.5.8. c).** The group recalled that at the AMOSSG/1 Meeting gusts had been proposed to be reported whenever they exceeded the mean wind speed by 10 km/h ( 5 kt). However, at this time, it was suggested that this change would not be warranted due to a number of reasons: it would imply substantial software changes which would be costly; it would render meteorological messages lengthy which, in the users' opinion, could unnecessarily load air traffic services (ATS) broadcasts (e.g. ATIS); there was no real operational need for such data since it could be usually obtained from the air traffic control (ATC) unit concerned. Furthermore, if this provision were amended, consideration would also have to be given for amending the criteria for issuing messages in the SPECI code form, which could result in a substantial increase in the number of meteorological messages. Under these circumstances, the group agreed that the existing 20 km/h (10 kt) criteria should be retained. It was further suggested that the term "gust" was not well defined in the *Guide to Meteorological Instruments and Methods of Observation*, WMO — No. 8 and that this issue should perhaps be brought to the attention of WMO. It was agreed that the Secretary would first send the definition of a "gust" as specified in the WMO — No. 8 for information to the group as part of ASMOSSG-Memo/13. If that definition did not meet the requirements of the AMOSSG, Saad agreed that he could bring the problem to the attention of appropriate WMO groups through the WMO Secretariat.

3.5 **Visibility**

3.5.1 **Deleted paragraph 4.6.2.** The attention of the group was drawn to the fact that existing paragraph 4.6.2 calling for manual insertion had been proposed for deletion in view of the conclusions made at the AMOSSG/1 Meeting (paragraphs 5.3.1 a) and b) refer).

3.5.2 **Paragraph 4.6.3.** With regard to this paragraph, a particular problem was encountered: the meaning of "immediate vicinity" used to qualify the area for which the reports in the METAR/SPECI code forms should be representative was not considered to be clear. It was first suggested that all references to "vicinity" in this connection were unnecessary as it could involve excessively extensive areas and that reports in the METAR/SPECI code forms should simply be representative of the aerodrome. However, in view of the importance for VFR operations of information about visibility in the vicinity of the aerodrome, the group concluded that the most appropriate solution, for the time being, would be to replace the ambiguous term "immediate vicinity" by "vicinity" — a term well defined under "Present weather". It was noted that similar adjustments would also have to be made under Sections 4.8 and 4.9.

3.5.3 **Paragraphs 4.6.4 to 4.6.6.** The meeting also took note of proposed new paragraphs 4.6.4 to 4.6.6 applicable for instrumented measurements of visibility dealing with the siting, displays and averaging of visibility observations which had been added.

3.5.4 **Paragraph 4.6.7.** A proposal was made that the reporting steps for visibility between 3 000 m and 5 000 m should be modified from 100 m to 500 m based on two grounds: first, it was considered that it would not be feasible to observe visibility with such high resolution; and second, the existence of a genuine operational requirement for such information was questioned. Some participants cautioned the group not to propose changes of this nature due to their cost implications unless a solid operational reason for it could be identified. Therefore, the group agreed that no change should be proposed at this stage and that this issue should be included in the future work programme for consideration by the AMOSSG/3 Meeting. It was further agreed that the possibility of using a 500 m reporting steps up to 10 km should also be looked into in this context.

3.6 **Runway visual range**

3.6.1 **Section 4.7.** The use of "observe" in the context of RVR was questioned; it was suggested that perhaps the term "assess" would be more appropriate. As this issue had already been considered in some length by the RVRSG and addressed in the *Manual of Runway Visual Range Observing and Reporting Practices* (Doc 9328), it was agreed that no amendments would be proposed at this meeting; however, the Secretary would look into the matter and propose changes, where warranted, to the draft version of Annex 3, Section 4.7 for further consideration by the AMOSSG/3 Meeting.

3.6.2 **Paragraphs 4.7.2 and 4.7.4.** The reason for the inclusion of take-off operations in Recommendation 4.7.2 rather than Standard 4.7.1 and their exclusion from Standard 4.7.4 was questioned. As a response, it was postulated that precise needs for instruments for take-off operations were not specified in any case in regulatory material and that therefore, the present formulation in Annex 3 would also seem to be satisfactory. To ensure that this was indeed the case, the Secretary was tasked to verify the matter with OPS experts in the ICAO Secretariat and report back to the group by the AMOSSG/3 Meeting.

3.6.3 **Paragraph 4.7.4.** The group noted that the requirements for representativeness had been explicitly associated with the category of operation. The group recalled that this link was currently implicit in Annex 3 while it was spelled out in the regional air navigation plans.

3.6.4 **Paragraph 4.7.15.** A member informed the group that in his State certain aircraft operations regularly requested RVR information from the range 1 500 m to 2 000 m and suggested therefore that there would be an operational requirement for such information. The group shared this point of view. Nevertheless, it felt that the provision of RVR from the 1 500 m to 2 000 m range should not be made mandatory since a large number of existing RVR systems would not be able to provide RVR values beyond 1 500 m. As Recommendation 4.7.15 was simply an enabling clause which would not oblige States to modify their existing systems, the group agreed to increase the reporting range of RVR up to 2 000 m.

3.7 **Present weather**

3.7.1 **Paragraph 4.8.2.** It was agreed that references to "climb-out" and "approach" areas should be deleted since these terms were not well defined in ICAO provisions. Moreover, in many instances it would be quite impossible to obtain any observations, independently of the method of observation, from these areas due to their extensive spatial dimensions.

3.7.2 **Paragraphs 4.8.5 and 4.8.6.** The group noted that new paragraphs 4.8.5 to 4.8.6 applicable for instrumented observations of present weather dealing with the siting and displays of instrumented systems had been added.

3.7.3 **Paragraph 4.8.9.** It was pointed out that the reference to thunder "heard" was not any longer appropriate at aerodromes where the thunder could often be masked by ambient noise or where instrumentation could be used for these observations. Therefore, the appropriate provision was amended to take account of instrumentation or the use of visible observations.

3.7.4 **Paragraph 4.8.10.** A proposal was made to replace the qualitative terms "light", "moderate" and "heavy" by precipitation rates. It was suggested that this information could be of use for meteorologists for forecasting purposes and for airport authorities for assessing the state of runways. The users, however, indicated that there was no such operational requirement and that precipitation rates would not always be well understood by pilots. Furthermore, it was recalled that WMO had developed quantitative criteria as to what constituted "light", "moderate" and "heavy" precipitation which could be readily used by automatic observing systems. Therefore, the group agreed that there was no operational justification to include it in Annex 3 at this stage.

3.8 **Cloud**

3.8.1 **Section 4.9.** It was noted that the terminology currently used, i.e. "cloud" had been questioned by the Meteorological Group (METG) of the European Air Navigation Planning Group (EANPG) which had proposed the use of "sky condition" instead. In this context, the group recalled that, according to the working arrangements between ICAO and WMO, the definitions of "all purely meteorological terms" was the responsibility of the WMO while ICAO would be responsible for the definitions of "all purely aeronautical terms". The group agreed that the terms used in cloud observations were of a "purely meteorological" nature and therefore, by definition, the responsibility of WMO. Since there was no WMO definition for the term "sky condition" while the terms "cloud amount", "cloud type", "height of cloud base" and "vertical visibility" were all well-defined in the WMO provisions (e.g. *Guide to Meteorological Instruments and Methods of Observation*, WMO — No. 8 and *International Meteorological Vocabulary*, WMO — No. 182), it was concluded that there was no justification to introduce "sky condition" and that existing terminology (i.e. "cloud amount" "cloud type", "height of cloud base" and "vertical visibility") should continue to be used.

3.8.2 **Paragraphs 4.9.5 and 4.9.6.** The group noted that new paragraphs 4.9.5 to 4.9.6 dealing with the siting and displays of instrumented systems applicable for instrumented observations of cloud had been added.

3.8.3 **Paragraph 4.9.8 b).** It was emphasized that for detecting cumulonimbus clouds by automated means, it would be essential that objective criteria be agreed upon as to what constitutes a CB-cloud and TCU-cloud. It was realized that the development of criteria of this nature was the responsibility of WMO. Therefore, the group concurred that this issue should be referred to for further consideration by the upcoming WMO PROMET Meeting (October 2001).

3.9 **Contents of reports**

3.9.1 **Section 4.13.** It was noted that in the draft amendment, the paragraph concerning the contents of reports had been proposed to be upgraded to a standard to align its status with similar paragraphs related to the contents of aerodrome and landing forecasts. However, the inclusion of supplementary information would be in a separate paragraph which would continue to be a recommendation only. The group agreed to this course of action.

3.10 **Specific tasks**

3.10.1 The group also reviewed progress made in the specific tasks identified by the AMOSSG/1 Meeting. They are addressed item by item in paragraphs 3.11 to 3.17 below.

3.11 **Revision of the manual insertion of elements in case of a system failure**.

3.11.1 The present formulation was considered adequate and no changes were proposed.

3.12 **Introduction of prevailing visibility (including the revision of the reporting of visibility in local reports and reports in the METAR/SPECI code forms)**

3.12.1 The group recalled that the AMOSSG was tasked by the Commission to develop a proposal related to the introduction of *prevailing* visibility in *lieu* of minimum visibility. When developing the proposal on prevailing visibility, the group was also expected to review:

a) the criteria related to the inclusion of directional variations in visibility included in reports in the METAR/SPECI code forms; and

b) the reporting of visibility in local routine and special reports, taking due account of forward-scatter meters and new ATS data link services.

3.12.2 The group undertook preliminary review of the proposal developed by the Secretary. It was noted that the proposal was based on the concept used in North America, in accordance with the instructions given by the Commission.

3.12.3 The group noted that the proposal replaced the minimum visibility by the prevailing visibility in reports in the METAR/SPECI code forms, in aerodrome forecasts in the TAF code form and in the trend forecasts. It was pointed out that prevailing visibility was proposed to be used also in trend forecasts appended to the local routine and special reports. The group considered that this would be justified since from the operational point of view, the visibility values were primarily related to circling minima for which a runway specific visibility would not be appropriate.

3.12.4 It was noted that the reporting of visibility in local routine and special reports, taking due account of forward-scatter meters and new ATS data link services ( sub-item b) under 3.12.1 refers) had already been taken into account in the proposal included at Appendix C and addressed in paragraph 3.5.3.

3.12.5 The group agreed in principle that prevailing visibility as used in North America should be introduced in Annex 3. However, the group felt that some details needed still further consideration. In particular, the following issues were singled out:

a) Systematic inclusion of minimum visibility. A point of view was expressed that for general support of meteorologists it could be useful if the minimum visibility were included systematically in all reports, not only in cases of important directional variations. The group realized that, if accepted, this proposal would imply that the minimum visibility would continue to be used as the parameter for landing minima and that no operational advantage compared to the present situation would have

been achieved. Therefore, the group could not concur with the proposal;

b) Inclusion of the direction of the minimum visibility. The group was aware of the fact that, whenever the minimum visibility was included, its direction should also be indicated. In this context, it was suggested that this requirement was meaningless, difficult to be complied with at large aerodromes and could sometimes be dangerous and should therefore, be eliminated. The users, however, pointed out that the directional information was indeed used by operators and was considered to be of some operational importance. The group agreed, therefore, that the direction of the minimum visibility should be retained in the provisions at this stage; and

c) Detection of prevailing visibility by automated systems. The group noted that the definition of prevailing visibility, as specified in North America, was geared to human observations and could not be readily applied to automated systems. Therefore, it was suggested that perhaps the development of another definition applicable for automated systems should be considered. The group realized, however, that in a parallel case concerning RVR, Annex 3 contained only one definition and that this definition for RVR was biassed towards human observations. In principle it seemed undesirable to develop parallel definitions for one specific parameter. Under these circumstances, the group agreed that a new provision applicable for automated systems, rather than another definition, should be developed by the Secretary for inclusion in the draft Section 4.6 of Annex 3 to be considered by the AMOSSG/3 Meeting.

3.12.6 The proposal as amended by the group is at Appendix D to this summary.

3.13 **Reassessment of the light intensity to be used to assess RVR in reports in the METAR/SPECI code forms**

3.13.1 No specific proposals on this sub-task had been made by the group; therefore, it was agreed that the issue be rediscussed at the AMOSSG/3 Meeting based on input from members and their advisers.

3.14 **Currency of the reference to the "middle marker site"**

3.14.1 The group recalled that the currency of the reference to the "middle marker site" in Annex 3 had been questioned at the AMOSSG/1 Meeting and that the Secretary had been tasked to look into the matter. The results of the investigation showed that the term was still in use in Annex 10 — *Aeronautical Telecommunications*, Volume I — *Radio Navigation Aids* (paragraphs 3.1.7.3.1 b) and 3.1.7.6.2.1 refer). However, to accommodate aerodromes where a middle marker beacon was not used, the siting of sensors for height of cloud base observations was proposed to be specified also with relation to the "a distance of 900 to 1 200 m (3 000 to 4 000 ft) from the landing threshold at the approach end of the runway".

3.15 **Revision of the weather phenomena to be presented under "present weather" and "recent weather" (including the use of "VC")**

3.15.1 Earle presented the results of the work of the sub-group which had been tasked to examine the possibility of simplifying the way in which "present" and "recent" weather were reported. The sub-group had considered the issue from various angles: from the forecaster, technological and operational perspectives. The AMOSSG expressed its gratitude to the sub-group for the extensive work undertaken. However, a number of participants regretted the lack of operational input and considered that consequently these aspects had not been fully covered. It was further suggested that the paper addressed mostly issues which were under WMO's responsibility and should therefore be addressed by the WMO

Commission for Aeronautical Meteorology (CAeM). Saad agreed that he would find out whether the paper could be referred to the CAeM for further consideration.

3.15.2 In the paper, the migration to the table-driven codes (BUFR, CREX) within WMO was also discussed. In view of WMO' s plans to discontinue the use of alpha-numeric codes in a few years' time and ICAO's plans to implement the digital Aeronautical Telecommunication Network (ATN), it was considered rather urgent that the future of the aeronautical meteorological codes be addressed within an ICAO forum. The Secretary thought that this issue may well be raised at the upcoming MET Divisional Meeting (2002) and felt that it would be desirable that some initial work would be undertaken before the world-wide meeting. It was noted that the migration issue was closely related to the work carried out by the AMOSSG; therefore, the group agreed that this aspect should be included in the future work programme of the group.

3.15.3 With regard to concrete proposals for amending the list of present weather phenomena, the group noted that little progress on this sub-task had been made by the sub-group. The sub-group had carried out an initial review of the weather phenomena to be reported under "present weather" and "recent weather" but had reached few definite conclusions. In fact, the only proposal which was acceptable to the AMOSSG was the merging of "hail" and "small hail" into one category. There were proposals to eliminate "drizzle", "snow grains", "ice pellets", "ice crystals", "shallow" , "patches", "partial" and "vicinity"; however, sound operational reasons were put forward for retaining each of these phenomena and no further progress could be made at this meeting. Under these circumstances, it was agreed that additional work would be required and that the consideration of the issue would be postponed till the AMOSSG/3 Meeting. It was emphasized that the proposal to be presented at the AMOSSG/3 Meeting must be developed in close cooperation with the users and operators and that the review should not be technologically driven.

3.16 **Generalization of the use of "NSC"**

3.16.1 The group recalled that the Air Navigation Commission had agreed that the wider use of "NSC" for clouds with high cloud base heights be considered. In this respect, it was noted that Amendment 72 to Annex 3 already aligned the practice of reporting clouds with the one used in aerodrome forecasts in the TAF code form in that "NSC" could be used if no clouds of operational significance (i.e. below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater, no cumulonimbus and no restriction on vertical visibility) were observed. However, Amendment 72 did not clearly specify whether clouds with bases above 1 500 m (5 000 ft) should be included in meteorological reports when lower clouds (i.e. clouds below 1 500 m (5 000 ft)) were present and included in these reports.

3.16.2 The present proposal attempted to clarify the provisions by limiting the reporting of clouds to those of operational significance under all circumstances. It was felt that this proposal was justified and would not compromise safety since information on high clouds had been absent from reports whenever the term "CAVOK" has been used, and no difficulties had been encountered.

3.16.3 It was noted that in accordance with the above proposal, automated weather observing systems should report "NSC" rather than "SKC" when no cloud was detected within ceilometer measurement limits.

3.17 **Reassessment of the requirement for reporting "TCU"**

3.17.1 It was noted that the inclusion of towering cumulus (TCU) as a cloud type to be reported had been introduced as a result of a proposal made during the Communications/Meteorology/Operations (COM/MET/OPS) Divisional Meeting (1990) and that it had not been part of the initial proposal made by the Expert Group of Aeronautical Meteorological Codes (1989) of the Commission for Aeronautical

Meteorology (CAeM). Furthermore, it was noted that there was no stated operational requirement for "TCU" in other ICAO Annexes (e.g. Annex 11 required information about "CB" but remained silent about "TCU"). It was also pointed out that "TCU" could not be detected by fully automated systems. Nevertheless, the users felt that the "TCU" could be a useful early indicator of the subsequent development of "CB" and should therefore be retained in local routine and special reports. The group agree to this course of action.

## 4. AGENDA ITEM 6: ASSESSMENT OF THE CURRENT CAPABILITY OF AUTOMATIC WEATHER OBSERVING SYSTEMS TO MEET THE EXPECTED FUTURE REQUIREMENTS

### 4.1 Introduction

4.1.1 The group recalled that during the AMOSSG/1 Meeting, an initial assessment of the capability of automatic weather observing systems to meet the **current** requirements as stated in ICAO Annexes had been undertaken. During this review, four critical parameters had been identified: visibility, cloud (amount and type), present weather and recent weather which, according to the provisions in Annex 3 — *Meteorological Service for International Air Navigation*, could not be fully observed by automated systems without human intervention. The group had concluded that while substantial progress had been made in this area, out of these critical parameters, only visibility could now be observed with instrumented systems; fully automatic systems still fell short of detecting a) present weather; b) cloud amount; c) cloud type; and d) recent weather (included in the supplementary information).

### 4.2 Discussion

4.2.1 Under this agenda item, the group reviewed the situation against the **expected future** requirements, which had been addressed under Agenda Item 5 and which are reproduced in Appendix C to this summary.

4.2.2 It was noted that the situation was unchanged from the AMOSSG/1 Meeting as no substantial simplification to the critical parameters had been made: the use of towering cumulus ("TCU") as a cloud type would continue in local routine and special reports and the changes made to the list of present and recent weather phenomena had been marginal.

### 4.3 Specific tasks

4.3.1 The group also reviewed progress made in two specific tasks identified by the AMOSSG/1 Meeting addressed under 4.4 and 4.5.

### 4.4 Monitoring of results from research on the automatic detection of cloud types: Cb and TCU

4.4.1 The group concluded that in this area, progress was being made and automated systems were coming close of being able to detect Cb-clouds in a reliable manner; however, the automatic systems could not yet distinguish TCU-clouds.

### 4.5 Intensity thresholds for weather phenomena

4.5.1 The group was aware that, in accordance with the working arrangements between ICAO and WMO, WMO was the organization responsible for defining the quantitative intensity thresholds for weather phenomena and that the progress in this area would, therefore, depend entirely on work carried out by appropriate WMO Commissions. It was noted that work had been undertaken by WMO

Commissions; in particular, the PROMET sub-group of the WMO Commission for Aeronautical Meteorology (CAeM) developed a number of proposals concerning precipitation intensities which had since been endorsed as guidance material by the appropriate WMO bodies. The salient results from the work undertaken by WMO were highlighted by Saad who presented an overview of WMO activities related to the development and implementation of automated meteorological observations including progress in coding visibility, present weather and intensity of precipitation.

### 4.6 Conclusions

4.6.1 As a result of these deliberations, the group concluded that the situation had not substantially changed since the last meeting and that taking into account the **expected future** requirements as shown in Appendix C, the following parameters still could not be observed with fully automatic systems, i.e. without human intervention: a) cloud amount; b) occurrence of cumulonimbus and towering cumulus clouds; c) some of the elements to be reported under present weather; and d) some of the elements to be reported under recent weather.

## 5. AGENDA ITEM 7: DEVELOPMENT OF GUIDANCE MATERIAL ON AUTOMATED WEATHER OBSERVING SYSTEMS

### 5.1 Introduction

5.1.1 The group recalled that the need for guidance material had been addressed by the AMOSSG/1 Meeting where it had been agreed that the Secretary would develop an initial proposal by the second meeting.

### 5.2 Discussion

5.2.1 The group reconfirmed that there was a need for guidance related to the use of automated observing systems. However, the group agreed that it would not be appropriate to include lengthy and detailed descriptions of automated weather observing systems in ICAO regulatory documents like Annex 3 — *Meteorological Service for International Air Navigation*. Therefore, the development of guidance material (i.e. a manual or a circular) would seem to be the best solution.

5.2.2 It was noted that there would be two options on how to proceed: either include a chapter in an existing ICAO Manual (e.g. *Manual of Aeronautical Meteorological Practice* (Doc 8896)) or develop a new, stand-alone document. The group agreed that, in view of the fairly wide scope of the subject, it would seem preferable if a new, stand-alone *Manual on Automated Weather Observing Systems at Aerodromes* were developed.

5.2.3 The group exchanged views on the time schedule to be followed. It was concluded that it would not be realistic to develop a draft Manual before the proposed MET Divisional Meeting (2002) is convened due to two main reasons:

a) procedural reasons. The corresponding Standards and Recommended Practices (SARPs) would only be developed as part of Amendment 73 to Annex 3 for consideration by the MET Divisional Meeting (2002); and

b) practical reasons. The development of such a manual would be a major undertaking and active and prolonged participation by the members and advisors of the AMOSSG would be required.

In view of this, the group agreed that the development of a manual on automated weather observing

systems should be proposed to the MET Divisional Meeting (2002), together with the associated proposal to amend Annex 3.

5.2.4 A draft outline of the content of the proposed *Manual on Automated Weather Observing Systems at Aerodromes* was reviewed by the group. It was agreed that, for initial planning purposes, the new manual would consist of the following chapters:

Introduction
Definitions and explanation of terms
Automatic observations of
- surface wind
- visibility
- RVR
- present weather
- cloud
- temperature and dew-point temperature
- atmospheric pressure
- supplementary information

Integrated automated observing systems
Reporting practices

It was noted that the structure of the second edition of the *Manual of Runway Visual Range Observing and Reporting Practices* (Doc 9328) had been used as a model.

5.2.5 The group noted that the outline was of a preliminary nature and that it did not include any details. It was suggested that issues such as maintenance and back-up procedures should be well covered in the new manual under "Integrated automated observing systems". Also the importance of using common data processing for all the displays of meteorological information no matter whether they were located at the meteorological station or at an ATS unit should be highlighted. The importance of close coordination with WMO in developing the manual was emphasized.

## 6. AGENDA ITEM 8: CONSIDERATION OF THE INCLUSION OF MODERN OBSERVING TECHNIQUES (E.G. REMOTE SENSING) IN ANNEX 3

### 6.1 Introduction

6.1.1 The group was aware that at its first meeting, a proposal had been made that the provisions of Chapter 4 of Annex 3 — *Meteorological Service for International Air Navigation* should be expanded to allow the use of modern observing techniques (e.g. remote sensing) to detect for example significant weather phenomena at the aerodrome and its vicinity and pass this information to air traffic services (ATS) units and users in graphical format. This information would apply to the climb-out and approach areas and would assist in reporting supplementary information but could not replace the information already included in local routine and special reports and reports in METAR/SPECI code forms. It would be provided subject to an agreement between the meteorological authority, ATS authority and users concerned. The group had agreed that Gérard would provide the proposal to the Secretary who would develop proposed wording for a new section to be included under Chapter 4 of Annex 3.

### 6.2 Discussion

6.2.1 It was noted that since the first meeting, Gérard had been transferred to other functions within his administration and he would not continue to participate in the work of the AMOSSG. Therefore, no proposal had been received from him on this subject for consideration by the group.

6.2.2 When discussing the issue, the group was made aware of the fact that remote sensing equipment (e.g. weather radar and satellite receiving equipment) was at the present time considered to be part of core services and facilities, the use of which was shared by aeronautical and other users of meteorological services and that no specific reports based on data from remote sensing equipment intended exclusively for aeronautical users were required. In this context, the users emphasized that from their point of view, the situation had not changed and that they would be opposed to the inclusion of explicit requirements for these systems in ICAO provisions due to the substantial cost implications.

6.2.3 The group exchanged views how to proceed and agreed that there was a need to pursue work on this sub-task as a part of the future work programme.

## 7. AGENDA ITEM 9 FUTURE WORK PROGRAMME OF THE GROUP

### 7.1 Introduction

7.1.1 The group recalled that, based on discussions on this subject at the AMOSSG/1 Meeting, the Secretary had developed a matrix of future tasks which had been included in the AMOSSG Web-site for information.

### 7.2 List of future tasks to be undertaken by the group

7.2.1 The group reviewed the list of its future tasks. The updated version is at Appendix E to this summary. The list included new sub-items stemming from the 42nd Meeting of the European Air Navigation Planning Group (EANPG), held in December 2000. In particular, two conclusions, noted by the Commission, i.e. Conclusion 42/14 — Cancellation of aerodrome forecasts; and Conclusion 42/17 — Annex 3 provisions for meteorological observations and reports, would have to be progressed with the assistance of the AMOSSG.

7.2.2 It was noted that some of the tasks called for in Conclusion 42/17 had already been dealt with by the AMOSSG. In particular, the group agreed that the following issues had already been adequately addressed by the group and that no specific item in the future work programme would be required:

a) strengthening of the requirements for representativeness. Paragraphs dealing with representativeness for surface wind, visibility, RVR, present weather and temperature observations had all been proposed for amendment (Appendix C refers) which would clarify some of the ambiguities encountered in the present edition of Annex 3. Moreover, it would be quite impossible to be too specific in Annex 3 since the local conditions vary substantially and additional guidance would have to be part of the proposed manual;

b) strengthening of the requirements to accept manual insertion in automated systems. This sub-task had been considered by Will and Jean-Paul and the formulation included in Amendment 72 was considered to be adequate;

c) availability of back-up procedures for automated systems. It was agreed that this issue had already been sufficiently addressed with the amendments made to 4.1.8 and 4.1.9; and

d) the introduction of the term "sky condition" as a concept for all parameters included in the cloud part of meteorological reports. The group recalled that this issue had been discussed at this meeting (paragraph 3.2.4 f) refers) and that it had been concluded that there was no justification to introduce "sky condition" and that existing terminology (i.e. "cloud amount" "cloud type", "height of cloud base" and "vertical visibility") should continue to be used.

7.3 **AMOSSG/3 Meeting**

7.3.1 The group recalled that at the AMOSSG/1 Meeting it had been indicated that most of the tasks of the study group should be completed by the end of year 2001 in view of the upcoming conjoint ICAO MET Divisional Meeting / 12th Session of the WMO Commission for Aeronautical Meteorology (CAeM). At that time, the meeting was expected to be held in May. However, since the AMOSSG/1 Meeting, the dates proposed for the MET Divisional Meeting were now in September 2002. Under these circumstances, the group agreed that the final AMOSSG Meeting before the MET Divisional Meeting could be held in early 2002 (January) in *lieu* of late 2001 (November) which would allow the group to have the maximum time available for preparing its draft amendment to Annex 3 to be presented for the MET Divisional Meeting.

8. **AGENDA ITEM 10 ANY OTHER BUSINESS**

8.1 As a result of the possibility of using common instrumentation for both RVR and visibility, the siting of this common instrumentation was raised. It was proposed that perhaps a forward-scatter meter located at the central parts of an aerodrome could be the most appropriate since this would provide representative visibility values for reports in the METAR/SPECI code forms. However, it was pointed out that in this case of RVR, values from the central location would not be representative of touch-down zone as required in Annex 3 and the information provided could be misleading in case of spatial fluctuations of RVR. It was therefore suggested that it would be preferable to site the common instrumentation along the runway to be able to obtain appropriate RVR values. No final conclusion were drawn; it was noted that Earle may provide an information paper on this issue for the AMOSSG/3 Meeting.

8.2 The group expressed its most sincere thanks to Wil for the excellent arrangements made for this meeting. It also wished to transmit its gratitude through Wil to the Director of the KNMI for the generous hospitality shown during the whole week. The group felt that all this had greatly contributed to the smooth running of the meeting and the successful results achieved.

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# APPENDIX A

## NAMES AND ADDRESSES OF THE MEMBERS, ALTERNATES AND ADVISERS ATTENDING THE SECOND MEETING OF THE AMOSSG (AMOSSG/2 MEETING)

| NOMINATED BY | NAME | POSTAL ADDRESS | FAX/TELEX/CABLE |
|---|---|---|---|
| **AUSTRALIA** | Mr. Bryan Boase<br>(member) | Regional Aviation and Defence Manager<br>(Western Australia)<br>Bureau of Meteorology<br>P.O. Box 1370<br>West Perth<br>WESTERN AUSTRALIA 6872 | Tel.: +61 8 92632205<br>Fax: +61 8 92632297<br>E-mail: b.boase@bom.gov.au |
| **CANADA** | Mrs. Joanne St-Coeur<br>(member) | Planning Officer<br>Policy and Corporate Affairs<br>Meteorological Service of Canada<br>North Tower, 4th Floor<br>Les Terrasses de la Chaudière<br>10, rue Wellington<br>Hull, Quebec<br>CANADA K1A 0H3 | Tel.: +1 819 997-4027<br>Fax.: +1 819 994-8854<br>E-mail: joanne.st.coeur@ec.gc.ca |
| | Mr. Earle Robinson<br>(adviser) | National Manager<br>Strategic Engineering Divsion<br>Atmospheric Monitoring & Water Survey Directorate<br>Meteorological Service of Canada<br>4905 Dufferin Street<br>Downsview, Ontario M3H 5T4<br>CANADA | Tel: +1 416 739 4586<br>Fax: +1 416 739 4261<br>E-mail: earle.robinson@ec.gc.ca |
| **FINLAND** | Mr. Ossi Korhonen<br>(member) | Chief Meteorologist<br>ATM Division<br>Air Navigation Services Department<br>Civil Aviation Administration<br>Lentäjäntie 3<br>01530 Vantaa<br>FINLAND | Tel: +358 9 8277 2274<br>Fax: +358 9 8277 2292<br>E-mail: Ossi.Korhonen@fcaa.fi |
| | Mr. Pekka Utela<br>(adviser) | Product Line Manager<br>Surface Weather Division<br>P. O. Box 26<br>FIN-00421 Helsinki<br>FINLAND | Tel: +358 9 894 92575<br>Fax: +358 9 894 92568<br>E-mail: pekka.utela@vaisala.com |
| **FRANCE** | Mr. Denis Lambergeon<br>(alternate) | Météo-France<br>Direction Générale (D2I/Aéro)<br>1, Quai Branly<br>75340 Paris, Cedex 07<br>FRANCE | Tel: +33 1 45 56 74 94<br>Fax: +33 1 45 56 7005<br>E-mail: denis.lambergeon@meteo.fr |
| | Mr. Roger Coatmeur<br>(adviser) | Direction de la Navigation Arienne<br>Bureau DNA/2 “Reglementation”<br>50, rue Henry Farman<br>75720 Paris Cedex 15<br>FRANCE | Tel: +33 1 58 09 47 28<br>Fax: +33 1 58 09 49 20<br>E-mail: coatmeur_roger@dna.dgac.fr |
| **NETHERLANDS** | Mr. W.il van Dijk<br>(member) | Royal Netherlands MET Institute<br>(KNMI)<br>Project Manager<br>Observations & Modelling Department<br>P.O. Box 201, 3730 AE De Bilt<br>NETHERLANDS | Tel: +3l 30 2206324<br>Fax: +3l 30 2210407<br>E-mail: dijkvanw@knmi.nl |

| NOMINATED BY | NAME | POSTAL ADDRESS | FAX/TELEX/CABLE |
|---|---|---|---|
| | Mr. Kees Blom<br>(adviser) | KNMI<br>Operational Service Coordinator (Schiphol)<br>P.B. 7625<br>1118 ZJ Luchthaven Schiphol<br>Havenmeesterweg 305<br>NETHERLANDS | Tel.: +31 20 316 33 25<br>Fax: +31 20 648 47 79<br>E-mail: blom@knmi.nl |
| **ASECNA** | Mr. Benoît Okossi<br>(alternate) | Chef Bureau Normalisation<br>Réglementation et Procédures MET<br>BP 10.622<br>Dakar<br>SENEGAL | Tel.: + 221 633 00 99<br>Fax : + 221 849 68 07<br>E-mail: benokossi@sentoo.sn |
| | Mr. Louis Finke-Fictime<br>(adviser) | Ingénieur général de la météorologie<br>Chargé de Mission<br>75, rue la Boétie<br>75008 Paris<br>FRANCE | Tel.: +331 44 95 07 19<br>Fax : +331 42 25 73 11<br>E-mail: paris-info@asecna.com |
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| | Mrs. Aino Laaksonen<br>(adviser) | Chief Meteorologist<br>Operations Control<br>International Relations<br>Finnair Oyj<br>Mail code OHM/62<br>FIN-01053 Finnair<br>FINLAND | Tel: +358 9 818 5628<br>Fax: +358 9 818 6700<br>E-mail: aino.laaksonen@finnair.com |
| **IFALPA** | Mrs. Carole Couchman<br>(alternate) | Regional Officer<br>Interpilot House<br>Gogmore Lane<br>Chertsey KT16 9AP<br>UNITED KINGDOM | Tel.: +44 1932 571711<br>Fax.: +44 1932 570920<br>E-mail: carolecouchman@ifalpa.org |
| **WMO** | Mr. Saad Benarafa<br>(member) | Aeronautical Meteorology Unit<br>World Weather Watch Applications Department<br>World Meteorological Organization<br>7 bis, avenue de la Paix, Case postale 2300<br>CH-1211, Geneva 2<br>SWITZERLAND | Tel: +41 22 730 84 08<br>Fax: +44 22 730 80 21<br>E-mail: benarafa_s@gateway.wmo.ch |

The meeting was served by the Secretary of the AMOSSG, Dr. Olli M. Turpeinen, Technical Officer in the MET Section of the Air Navigation Bureau of ICAO. The meeting was also attended by Mr. Björn Hellroth, Regional Officer MET/AIS of the European and North Atlantic Office.

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# APPENDIX B

## I LIST OF STUDY NOTES

| No. | Date | Agenda Item | Subject | Presented by |
|---|---|---|---|---|
| 1 | 15.09.00 | 4 | Adoption of the agenda | Secretary |
| 2 | 23.11.00 | 5 | Review of the requirements for meteorological observations and reports contained in Chapter 4 to Annex 3 | Secretary |
| 3 | 23.01.01 | 6 | Assessment of the current capability of automatic weather observing systems to meet the expected future requirements | Secretary |
| 4 | 23.01.01 | 7 | Development of guidance material on automatic weather observing systems | Secretary |
| 5 | 23.01.01 | 8 | Consideration of the inclusion of modern observing techniques (e.g. remote sensing) in Annex 3 | Secretary |
| 6 | 23.01.01 | 9 | Future work programme of the group | Secretary |
| 7 | 12.01.01 | 5 | Review of the requirements for meteorological observations and reports contained in Chapter 4 to Annex 3 | O. Korhonen |
| 8 | 25.01.01 | 5 | Review of the requirements for meteorological observations and reports contained in Chapter 4 to Annex 3: Manual insertion in automated systems | W. van Dijk |
| 9 | 29.01.01 | 5 | Review of the requirements for meteorological observations and reports contained in Chapter 4 to Annex 3: Review of reportable present weather phenomena | E. Robinson |

## II LIST OF INFORMATION PAPERS

| | | | | |
|---|---|---|---|---|
| 1 | 26.01.01 | — | Working Arrangements for the Meeting | Secretary |
| 2 | 11.01.01 | 6 | Assessment of the current capability of automatic weather observing systems to meet the expected future requirements: WMO activities related to automated meteorological observations | S. Benarafa |

| No. | Date | Agenda Item | Subject | Presented by |
|---|---|---|---|---|
| 3 | 25.01.01 | 5 | Review of the requirements for meteorological observations and reports contained in Chapter 4 to Annex 3: Progress report PT/METAOP | W. van Dijk |
| 4 | 25.01.01 | 5 | Review of the requirements for meteorological observations and reports contained in Chapter 4 to Annex 3: Review of Annex 3, Chapter 4 | W. van Dijk |
| 5 | 8.02.01 | 5 | Review of the requirements for meteorological observations and reports contained in Chapter 4 to Annex 3: Progress report of the EANPG (METG) activities concerning meteorological parameters required for aerodrome operations | Secretary |
| 6 | 12.02.01 | 5 | Review of the requirements for meteorological observations and reports contained in Chapter 4 to Annex 3: Analysis of Annex 3 visibility requirements | M. Leroy |
| 7 | 12.02.01 | 5 | Review of the requirements for meteorological observations and reports contained in Chapter 4 to Annex 3: Redefinition of Prevailing Visibility | M. Landreville |
| 8 | 23.02.01 | 5 | Review of the requirements for meteorological observations and reports contained in Chapter 4 to Annex 3: Description of the United States approach to automated surface observations | K. Browne |

## III LIST OF DISCUSSION PAPERS

| | | | | |
|---|---|---|---|---|
| 1 | 21.02.01 | — | Summary of Discussions (20.2.01) | Secretary |
| 2 | 22.02.01 | — | Summary of Discussions (20-21.2.01) | Secretary |
| 3 | 23.02.01 | — | Summary of Discussions (20-22.2.00) | Secretary |

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# APPENDIX C

## AMENDMENT PROPOSALS TO CHAPTER 4 (relevant parts) OF ANNEX 3

## INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

## METEOROLOGICAL SERVICE FOR INTERNATIONAL AIR NAVIGATION

## BASED ON THE CONSOLIDATED AMENDMENT 72 TO ANNEX 3

**NOTE:**
**still subject to adoption by ICAO Council and WMO Executive Council**
**(applicable November 2001)**

| | |
|---|---|
| ***Editorial Note: —*** | The dashed line indicates the limit between "core" Standards and Recommended Practices (SARPs) and "technical specifications". If the split of Annex 3 is carried out, the notes under the templates should be replaced by references to the relevant "requirement or technical specification". The sub-headings have been introduced for clarity and they would only be retained in the part including the "requirement or technical specifications". |

## CHAPTER 4. METEOROLOGICAL OBSERVATIONS AND REPORTS

• • • • •

4.1.8 At aerodromes, with runways intended for Category II and III instrument approach and landing operations, automated equipment for measuring or assessing, as appropriate, and for monitoring and remote indicating of surface wind, runway visual range~~, and cloud~~ height of cloud base, air and dew-point temperatures and pressure values shall be installed to support approach and landing and take-off operations. These devices shall be integrated automatic systems for acquisition, processing, dissemination and display in real time of the meteorological parameters affecting landing and take-off operations. The design of ~~these~~ integrated automatic systems shall observe Human Factors principles and include back-up procedures. Provision shall be made for the manual insertion of meteorological parameters in case of failure of the integrated automatic systems.

*Note 1.— Categories of precision approach and landing operations are defined in Annex 6, Part I.*

• • • • •

4.1.9 **Recommendation.—** *At aerodromes, with runways intended for Category I instrument approach and landing operations, automated equipment for measuring or assessing, as appropriate, and for monitoring and remote indicating of surface wind, runway visual range~~, and cloud~~ height of cloud base, air and dew-point temperatures and pressure values should be installed to support approach and landing and take-off operations . These devices should be integrated automatic systems for acquisition, processing, dissemination and display in real time of the meteorological parameters affecting landing and take-off operations. The design of ~~these~~ integrated automatic systems should observe Human Factors principles and include back-up procedures. Provision should be made for the manual insertion of meteorological parameters in case of failure of the integrated automatic systems*

4.1.~~9~~10 **Recommendation.—** *Where an integrated automatic system is used for the dissemination/display of meteorological information, it should be capable of accepting the manual insertion of data covering those meteorological elements which cannot be observed by automatic means or cannot be ensured by other means.*

• • • • •

## 4.5 Observing and reporting of surface wind

*Introductory Note. — Selected criteria applicable to meteorological information referred to in 4.5 to 4.12 for inclusion in aerodrome reports are given in tabular form in Attachment C.*

4.5.1 **Recommendation.—** *The mean direction and the mean speed of the surface wind should* shall *be measured, as well as significant variations of the wind direction and speed*, and reported to the nearest 10 degrees true and nearest 1 kilometre per hour (or 1 knot), respectively.

REPRESENTATIVENESS:

4.5.2 **Recommendation.—** *When local routine and special reports are used for departing aircraft, the surface wind observations for these observations should be representative of conditions along the runway; when local routine and special reports are used for arriving aircraft, the surface wind observations for these reports should be representative of the touchdown zone. Surface wind observations for local routine and special reports should be representative of conditions at a height of ~~6 to~~ 10 m (~~20 to~~ 30 ft) above the runway.*

**4.5.3 Recommendation. —** *~~Surface wind observations made for~~ For reports in the METAR/SPECI code forms, the surface wind observations should be representative of conditions at a height of ~~6 to~~ 10 m (~~20 to~~ 30 ft) above the whole runway where there is only one runway and the whole runway complex where there is more than one runway.*

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SITING:

4.5.~~3~~4 **Recommendation.—** *Representative surface wind observations should be obtained by the use of sensors appropriately sited as determined by local conditions. Sensors for surface wind observations for local routine and special reports should be sited to give the best practicable indication of conditions along the runway, e.g. lift-off and touchdown zones. At aerodromes where topography or prevalent weather conditions cause significant differences in surface wind at various sections of the runway, additional sensors should be provided.*

*Note. — Since, in practice, the surface wind cannot be measured directly on the runway, surface wind observations for take-off and landing ~~should~~ are expected to be the best practicable indication of the winds which an aircraft will encounter during take-off and landing.*

DISPLAYS:

4.5.~~4~~5 Surface wind ~~indicators~~ displays relating to each sensor shall be located in the meteorological station with corresponding ~~indicators~~ displays in the appropriate air traffic services units. The ~~indicators~~ displays in the meteorological station and in the air traffic services units shall relate to the same sensors, and where separate sensors are required as specified in 4.5.3, the ~~indicators~~ displays shall be clearly marked to identify the runway and section of runway monitored by each sensor.

4.5.~~7~~6 **Recommendation.—** *Where multiple sensors are installed, the ~~2-minute time averages~~ mean values of, and significant variations in, the surface wind direction and speed for each sensor ~~used in local routine and special reports~~ should be ~~monitored~~ derived and displayed by automatic equipment.*

AVERAGING:

4.5.~~5~~7 ~~**Recommendation.—**~~ The averaging period for wind observations ~~should~~ shall be:

~~b~~a) 2 minutes for local routine and special reports and for wind~~ indicators~~ displays in air traffic services units; and

~~a~~b) 10 minutes for reports in the METAR/SPECI code forms, except that when the 10-minute period includes a marked discontinuity in the wind direction and/or speed, only data occurring since the discontinuity should be used for obtaining mean values, hence the time interval in these circumstances should be correspondingly reduced.

*Note.— A marked discontinuity occurs when there is an abrupt and sustained change in wind direction of 30° or more, with a wind speed of 20 km/h (10 kt) before or after the change, or a change in wind speed of 20 km/h (10 kt) or more, lasting at least 2 minutes.*

REPORTING:

4.5.~~6~~8 ~~**Recommendation.—**~~ In local routine and special reports and in reports in the METAR/SPECI code forms:~~;~~

a) the units of measurement used for the wind speed shall be indicated;

b) variations in the mean wind direction~~ should~~ shall be~~ given~~ reported as follows, if the total variation is 60° or more~~;~~:

1) when the total variation is between 60° and 180° and the wind speed is more than 6 km/h (3 kt) such directional variations~~ should be expressed~~ shall be reported as the two extreme directions between which the wind has varied during the past 10 minutes~~.~~: and

2) when the total variation is 180° or more; or when the total variation is between 60° and 180° and the wind speed is 6 km/h (3 kt) or less, the wind direction shall be reported as variable with no mean wind direction.

c) variations from the mean wind speed (gusts) during the past 10 minutes~~ should~~ shall be reported ~~only~~ when~~ the variation from~~ the maximum wind speed exceeds the mean speed~~ is~~ by 20 km/h (10 kt) or more; such~~ speed~~ variations~~ (gusts) should~~ shall be~~ expressed~~ reported as the maximum ~~and minimum~~ wind speed~~s~~ attained; and

d) when a wind speed of 200 km/h (100 kt) or more is reported, it shall be indicated as 200 km/h (100 kt).

When the 10-minute period includes a marked discontinuity in the wind direction and/or speed, only variations~~ in~~ from the mean wind direction and mean wind speed occurring since the discontinuity~~ should~~ shall be reported. The variations~~ in~~ from the mean wind direction and mean wind speed~~ should~~ shall be derived:

~~b~~1) for automated systems from the actual measured values of wind direction and speed, and not from the 2-minute and 10-minute running averages required under 4.5.~~5~~7.; and

~~a~~2) for non-automated systems from the wind direction and speed~~ indicators~~ displays or from the anemograph recorder trace if available~~; and/or~~.

*Note.— See note under 4.5.5.*

4.5.~~8~~9 **Recommendation.—** *In local routine and special reports:*~~;~~

~~*the name of the element should be given. The wind direction and speed and significant variations thereof should be given; the wind direction should be given in three figures rounded to the nearest 10 degrees true; this should be followed by "/" and by the wind speed; the units used for speed should be kilometres per hour or knots and should be indicated in the written form of the message.*~~

*a) if the wind is observed from more than one location along the runway, the locations for which these values are representative should be indicated,~~ as necessary~~;*

*a) when there is more than one runway in use and the wind related to these runways is observed, the available wind values for each runway should be given~~, as necessary~~, and the runways to which the values refer should be reported~~.~~;*

*c) when~~ directional~~ variations from the mean wind direction are to be reported in accordance with 4.5.8 b) 2), the two extreme directions between which the wind has varied should be reported~~ in degrees.~~;*

*d) when variations from the mean speed (gusts) are to be reported in accordance with 4.5.8 c), ~~they should be reported as the maximum and~~ the minimum value~~s~~ of the speed attained should also be reported.~~ in kilometres per hour or knots. When the wind speed is less than 2 km/h (1 kt), this should be indicated as calm. When a wind speed of 200 km/h (100 kt) or more is reported, it should be indicated as 200 km/h (100 kt). No mean wind direction should be indicated for variable winds with a total variation of 60° or more when:~~*

~~*a) variations in wind direction are less than 180° and the mean wind speed is 6 km/h (3 kt) or less ; the two extreme directions between which the wind has varied should be indicated; or*~~

~~*b) variations in wind direction are 180° or more; or where it is not possible to report a mean wind direction, for example, when a thunderstorm passes over the aerodrome; the wind should be indicated as variable with no reference to the two extreme directions between which the wind has varied.*~~

*4.5.~~9~~10* ***Recommendation.—*** *In reports in the METAR/SPECI code forms, when variations from the mean wind direction are to be reported in accordance with 4.5.8 b) 2), extreme directions between which the wind has varied should not be reported.*

~~*a) variations from the mean wind direction should be given if the total variation is 60° or more but less than 180° with mean speeds above 6 km/h (3 kt);*~~

~~*b) maximum wind speed should be included only if it exceeds the mean speed by 20 km/h (10 kt) or more;*~~

~~*c) minimum wind speed should not be given.*~~

### 4.6 Observing and reporting of visibility

4.6.1 ~~**Recommendation.—**~~ The visibility~~ should~~ as defined in Chapter 1 shall be measured or observed~~ by reference to objects or lights whose distance from the point of observation is known~~, and reported in metres and kilometres in accordance with the reporting steps specified in 4.6.7.

~~Note 1.— The definition of visibility is given in Chapter 1.~~

*Note ~~2~~ — Guidance on the conversion of instrument readings into visibility is given in Attachment D.*

~~4.6.2 **Recommendation.**— *Where observations are made using automatic observing equipment, provision should be made for manual insertion of the visibility value(s) in the corresponding displays.*~~

REPRESENTATIVENESS

4.6.~~3~~2 **Recommendation.**— *When local routine and special reports are used for departing aircraft, the visibility observations for these reports should be representative of the take-off~~/climb-out~~ area; when local routine and special reports are used for arriving aircraft, the visibility observations for these reports should be representative of the ~~approach~~ /landing area.*

4.6.3 **Recommendation.**— ~~*Visibility observations made for*~~ *For reports in the METAR/SPECI code forms, the visibility observations should be representative of the aerodrome and its ~~immediate~~ vicinity; in such observations special attention should be given to significant directional variations.*

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SITING

4.6.4 **Recommendation.** — *When instrumented systems are used for the measurement of visibility, representative visibility observations should be obtained by the use of sensors appropriately sited as determined by local conditions. Sensors for visibility observations for local routine and special reports should be sited to give the best practicable indications of visibility along the runway.*

DISPLAYS

4.6.5 **Recommendation.** —*When instrumented systems are used for the measurement of visibility, visibility displays relating to each sensor should be located in the meteorological station with corresponding displays in the appropriate air traffic services units. The displays in the meteorological station and in the air traffic services units should relate to the same sensors, and where separate sensors are required as specified in 4.6.4, the displays should be clearly marked to identify the area, e.g. runway and section of runway, monitored by each sensor.*

AVERAGING

4.6.6 **Recommendation.** —*When instrumented systems are used for the measurement of visibility, the averaging period should be*

*a) 1 minute for local routine and special reports and for visibility displays in air traffic services units; and*

*b) 10 minutes for reports in the METAR/SPECI code forms except when the 10-minute period immediately preceding the observation includes a marked discontinuity in the visibility, only those values occurring after the discontinuity should be used for obtaining mean values.*

*Note.— A marked discontinuity occurs when there is an abrupt and sustained change in visibility, lasting at least 2 minutes, which reaches or passes through criteria for the issuance of special reports in the SPECI code form given in 4.3.4 e).*

REPORTING

4.6.~~4~~7 **~~Recommendation.—~~** In local routine and special reports and in reports in the METAR/SPECI code form, ~~the name of the element should be given and the units used for visibility should be specified clearly.~~ the visibility shall be reported in steps of 50 m when ~~When~~ the visibility is less than 800 m~~; it should be expressed in steps of 50 m~~ in steps of 100 m, when it is 800 m or more but less than 5 km ~~in steps of 100 m~~; in kilometre steps, when the visibility is 5 km or more but less than 10 km ~~in kilometre steps~~; and it shall be given as 10 km when ~~it~~ the visibility is 10 km or more~~, it should be given as 10 km~~, except when the conditions for the use of CAVOK apply.

*Note.— Specifications concerning the use of CAVOK are given in 4.13.2.*

4.6.8 **Recommendation.—** *In local routine and special reports the units of measurement used for visibility should be specified.*

4.6.9 **Recommendation.—** *In local routine and special reports, when instrumented systems are used for the measurement of visibility:*

*a) if the visibility is observed from more than one location along the runway as specified in 4.6.~~3~~2, the values representative of the touchdown zone should be reported first, followed, as necessary, by the values representative of the mid-point and stop-end of the runway, ~~these~~ and the locations for which these values are representative should be indicated~~, as necessary.~~; and*

*b) when there is more than one runway in use and the visibility is observed related to these runways, the available visibility values for each runway should be ~~given~~ reported~~, as necessary,~~ and the runways to which the values refer should be indicated.*

~~*Note 1.— Specifications concerning the use of CAVOK are given in 4.13.2.*~~

~~*Note 2.— Guidance on currently attainable accuracy for observing visibility is given in Attachment B.*~~

4.6.~~5~~10 **Recommendation.—** *In reports in the METAR/SPECI code forms, when the visibility is not the same in different directions:*

*a) the lowest visibility should be reported~~.~~; ~~When the visibility is not the same in different directions and~~*

*b) when the visibility in one or more directions is more than 50 per cent above the lowest visibility, the lowest visibility observed should be reported and its general direction in relation to the site of the meteorological station indicated by reference to one of the eight points of the compass. If the lowest visibility is observed in more than one direction, then the most operationally significant direction should be reported~~.~~;*

*c) directional variations in visibility should be reported when the lowest visibility is less than 1 500 m and the visibility in another direction is more than 5 000 m. Where such variations in visibility are observed in more than one direction, then the most operationally significant direction should be reported~~.~~; and*

*d) when the visibility is fluctuating rapidly, and significant directional variations cannot be given, the lowest visibility should be reported, with no indication of direction.*

## 4.7 Observing and reporting of runway visual range

~~4.7.1 **Recommendation.** — *Since, in practice, the runway visual range cannot be measured directly on the runway and in view of other limitations imposed by observation methods, a runway visual range observation should be the best possible assessment of the range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line. For this assessment a height of approximately 5 m (15 ft) should be regarded as corresponding to the average eye level of a pilot in an aircraft.*~~

*Note.— Guidance on the subject of runway visual range is contained in the ICAO* Manual of Runway Visual Range Observing and Reporting Practices *(Doc 9328).*

4.7.~~3~~1 Runway visual range ~~observations~~ as defined in Chapter 1 shall be ~~made~~ observed on all runways intended for Category II and Category III instrument approach and landing operations.

4.7.~~4~~2 **Recommendation.—** *Runway visual range ~~observations~~ as defined in Chapter 1 should be ~~made~~ observed on all runways intended for use during periods of reduced visibility, including:*

*a) precision approach runways intended for Category I instrument approach and landing operations;*

*b) runways used for take-off and having high-intensity edge lights and/or centre line lights.*

*Note.— Precision approach runways are defined in Annex 14, Volume I, Chapter 1, under "Instrument runway".*

4.7.~~6~~3 ~~**Recommendation.—**~~ The runway visual range ~~should~~ observations made in accordance with 4.7.1 and 4.7.2 shall be reported in metres in accordance with the reporting steps specified in 4.7.14 throughout periods when either the horizontal visibility or the runway visual range is ~~observed to be~~ less than 1 500 m.

REPRESENTATIVENESS

4.7.~~2~~4 Runway visual range observations shall be representative of:

a) the touchdown zone of the runway intended for non-precision or Category I instrument approach and landing operations;

b) the touchdown zone and~~, depending on the category of operation for which the runway is intended and the length of the runway, of~~ the mid-point of the runway intended for Category II instrument approach and landing operations; and

c) the touchdown zone, the mid-point and stop-end of the runway intended for Category III instrument and landing operations.

— — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — —

SITING

4.7.5 **Recommendation. —***Runway visual range should be observed at a height of approximately 2.5 m (7.5 ft).*

4.7.~~5~~6 **Recommendation.—** *Runway visual range~~ observations~~ should be~~ carried out~~ observed at a lateral distance from the runway centre line of not more than 120 m. The site for observations to be representative of the touchdown zone should be located about 300 m along the runway from the threshold. The sites for observations to be representative of the mid-point and stop-end of the runway should be located at a distance of 1 000 to 1 500 m along the runway from the threshold and at a distance of about 300 m from the other end of the runway. The exact position of these sites and, if necessary, additional sites should be decided after considering aeronautical, meteorological and climatological factors such as long runways, swamps and other fog-prone areas.*

INSTRUMENTED SYSTEMS

4.7.7 Instrumented systems based on transmissometers or forward-scatter meters shall be used to assess runway visual range on runways intended for Category II and III instrument approach and landing operations.

4.7.8 **Recommendation. —** *Instrumented systems based on transmissometers or forward-scatter meters should be used to assess runway visual range on runways intended for Category I instrument approach and landing operations.*

*Note.— As accuracy can vary from one instrument design to another, performance characteristics are to be checked before selecting an instrument for assessing RVR. The calibration of a forward-scatter meter has to be traceable and verifiable to a transmissometer standard, the accuracy of which has been verified over the intended operational range. Guidance on the use of transmissometers and forward-scatter meters in instrumented RVR systems is given in the* Manual of Runway Visual Range Observing and Reporting Practices *(Doc 9328).*

DISPLAYS

4.7.9 Where runway visual range is determined by instrumented~~ means~~ systems, one~~ indicator~~ display or more if required, shall be located in the meteorological station with corresponding~~ indicators~~ displays, in the appropriate air traffic services units. The~~ indicators~~ displays in the meteorological station and in the air traffic services units shall be connected to the same measuring device(s), and where separate sensors are required as specified in 4.7.6, the displays shall be clearly marked to identify the runway and section of runway monitored by each sensor.

4.7.1~~5~~0 **Recommendation.—** *Where runway visual range is determined by human observers, runway visual range should be reported to the appropriate local air traffic services units, whenever there is a change in the value to be reported in accordance with the reporting scale (except where the provisions of 4.3.2 a) or b) apply). The transmission of such reports should normally be completed within 15 seconds after the termination of the observation.*

AVERAGING

4.7.1~~0~~1 ~~**Recommendation. —**~~ Where instrumented systems are used for the assessment of runway visual range, their output~~ should~~ shall be updated at least every 60 seconds to permit the provision of current, representative values. The averaging period for runway visual range values~~ should~~ shall be:

~~b~~a) 1 minute for local routine and special reports and for runway visual range~~ indicators~~ displays in air traffic services units; and

~~a~~b) 10 minutes for reports in the METAR/SPECI code forms except when the 10-minute period immediately preceding the observation includes a marked discontinuity in runway visual range

values, only those values occurring after the discontinuity ~~should~~ shall be used for obtaining mean values~~; and~~.

*Note.— A marked discontinuity occurs when there is an abrupt and sustained change in runway visual range, lasting at least 2 minutes, which reaches or passes through criteria for the issuance of special reports in the SPECI code form given in 4.3.4 f).*

LIGHT INTENSITY

4.7.1~~1~~2 **Recommendation.—** *When instrumented systems are used for the assessment of runway visual range, computations should be made separately for each available runway. Whatever intensities are used, RVR should not be computed for a light intensity of 3 per cent or less of the maximum light intensity available on a runway. The light intensity to be used for the computation should be:*

*a) for a runway with the lights switched on, the light intensity actually in use on that runway;*

*b) for a runway with lights switched off (or at the lowest setting pending the resumption of operations), the optimum light intensity that would be appropriate for operational use in the prevailing conditions.*

*In reports in the METAR/SPECI code forms, the runway visual range should be based on the same light intensity settings as those appropriate for use during take-off and landing at the time the report is made, but excluding any temporary changes in the light intensity settings.*

*Note.— Guidance on the conversion of instrumented readings into runway visual range is given in Attachment D.*

STATUS

4.7.1~~2~~3 **Recommendation.—** *The units providing air traffic service and aeronautical information service for an aerodrome should be kept informed without delay of changes in the serviceability status of the instrumented runway visual range observing system.*

REPORTING

4.7.1~~3~~4 In local routine and special reports and in reports in the METAR/SPECI code forms, the reporting scale shall consist of increments of 25 m for runway visual range below 400 m, increments of 50 m for runway visual range between 400 m and 800 m and increments of 100 m for runway visual range above 800 m. Any observed value which does not fit the reporting scale in use shall be rounded down to the nearest lower step in the scale.

4.7.1~~4~~5 **Recommendation.—** *Fifty metres should be considered the lower limit and ~~1 500~~ 2 000 metres the upper limit for assessments of runway visual range. Outside of these limits local routine and special reports and reports in the METAR/SPECI code forms ~~reports~~ should merely indicate that the runway visual range is less than 50 m or more than ~~1 500~~ 2 000 m.*

4.7.16 In local routine and special reports and in reports in the METAR/SPECI code forms:

a) when runway visual range is above the maximum value that can be determined by the system in use, it shall be reported using the abbreviation “ABV” in local routine and special reports

and the abbreviation "P" in reports in the METAR/SPECI code forms, followed by the maximum value that can be determined by the system; and

b) when the runway visual range is below the minimum value that can be determined by the system in use, it shall be reported using the abbreviation "BLW" in local routine and special reports and the abbreviation "M" in reports in the METAR/SPECI code forms followed by the minimum value that can be determined by that system.

4.7.16~~7~~ **Recommendation.~~—~~** In local routine and special reports~~ the name of the element should be given in abbreviated form and~~:

a) the units of measurement used~~ should~~ shall be included.~~ When runway visual range is above the maximum value which can be determined by the system in use, it should be reported using the term "ABV" followed by the maximum value that can be determined by the system. When the runway visual range is below the minimum value which can be determined by the system in use, it should be reported using the term "BLW" followed by the minimum value that can be determined by that system.~~

b) if runway visual range is observed from one location along the runway,~~ about 300 m from the threshold~~ i.e. the touchdown zone, it~~ should~~ shall be included without any indication of location~~.~~;

c) if the runway visual range is observed from more than one location along the runway, the value representative of the touchdown zone~~ should~~ shall be~~ given~~ reported first, followed by the values representative of the mid-point and stop-end~~. The~~ and the locations for which these values are representative~~ should~~ shall be indicated~~ as "TDZ", "MID" and "END", respectively.~~; and

d) when there is more than one runway in use, the available runway visual range values for each runway~~ should~~ shall be~~ given~~ reported and the runways to which the values refer ~~should~~ shall be indicated~~; if more than one runway is in use, but runway visual range is available only for one runway, that information should be indicated~~.

4.7.17~~8~~ **Recommendation.~~—~~** In reports in the METAR/SPECI code forms:

a) only the value representative of the touchdown zone~~ should~~ shall be~~ given~~ reported and no indication of location on the runway~~ should~~ shall be included~~.~~;

b) where there is more than one runway available for landing, touchdown zone runway visual range values~~ should~~ shall be included for all such runways, up to a maximum of four, and the runways to which the values refer~~ should~~ shall be indicated.

4.7.18~~9~~ **Recommendation. —** *In reports in the METAR/SPECI code forms, when~~ Where~~ instrumented systems are used for the assessment of runway visual range, the variations in runway visual range during the 10-minute period immediately preceding the observation should be included~~ in reports in the METAR/SPECI code forms~~ as follows:*

*a) if the runway visual range values during the 10-minute period have shown a distinct tendency, such that the mean during the first 5 minutes varies by 100 m or more from the mean during the second 5 minutes of the period, this should be indicated. When the variation of the runway visual range values shows an upward or downward tendency this should be indicated by the abbreviation "U" or "D" respectively. In circumstances when actual fluctuations during the 10-minute period~~ indicate~~ show no distinct tendency this*

*should be indicated ~~reported~~ using the abbreviation "N". When indications of tendency are not available, no~~ne of the foregoing~~ abbreviations should be included; and*

*b) if the one-minute runway visual range values during the 10-minute period vary from the mean value by more than 50 m or more than 20 per cent of the mean value, whichever is greater, the one-minute mean minimum and the one-minute mean maximum values should be reported instead of the 10-minute mean value. If the 10-minute period immediately preceding the observation includes a marked discontinuity in runway visual range values, only those values occurring after the discontinuity should be used to obtain variations.*

*Note.— A marked discontinuity occurs when there is an abrupt and sustained change in runway visual range, lasting at least 2 minutes, which reaches or passes through criteria for the issuance of special reports in the SPECI code form given in 4.3.4 f).*

## 4.8 Observing and reporting of present weather

4.8.1 **~~Recommendation.—~~** The present weather occurring at ~~and/or near~~ the aerodrome ~~should~~ shall be observed and this shall be reported as necessary.

REPRESENTATIVENESS

4.8.2 **Recommendation.—** *When local routine and special reports are used for departing aircraft, the present weather information should be representative of the take-off ~~and climb-out~~ area; when local routine and special reports are used for arriving aircraft, the present weather information should be representative of the ~~approach and~~ landing area.*

4.8.3 **Recommendation.—** *~~Observations of present weather made for~~ For reports in the METAR/SPECI code forms, the present weather information should be representative of the aerodrome and its ~~immediate~~ vicinity.*

MANUAL INSERTION

4.8.~~2~~4 **Recommendation.—** *Where observations are made using automatic observing equipment, provision should be made for manual insertion in the corresponding displays of those weather elements which cannot be determined adequately by that equipment.*

— — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — —

SITING

4.8.5 **Recommendation.** — *When instrumented systems are used for observing present weather, representative present weather information should be obtained by the use of sensors appropriately sited as determined by local conditions.*

DISPLAYS

4.8.6 **Recommendation.** — *When instrumented systems are used for observing present weather, displays of representative present weather information should be located in the meteorological station with corresponding displays in the appropriate air traffic services units.*

REPORTING

4.8.~~3~~7 ~~**Recommendation.—**~~ In local routine and special reports and in reports in the METAR/SPECI code forms, present weather phenomena ~~should~~ shall be reported in terms of type and characteristics and qualified with respect to intensity or proximity to the aerodrome, as appropriate.

4.8.~~4~~8 **Recommendation.—** *In local routine and special reports and in reports in the METAR/SPECI code forms, the types of present weather phenomena which should be reported, their respective abbreviations and relevant criteria for their reporting of significance to aviation are as follows:*

*a) Precipitation*

| | |
|---|---|
| *Drizzle* | *DZ* |
| *Rain* | *RA* |
| *Snow* | *SN* |
| *Snow grains* | *SG* |
| *Ice pellets* | *PL* |
| *Ice crystals (very small ice crystals in suspension, also known as diamond dust)* | *IC* |
| *— Reported only when associated visibility is 5 000 m or less.* | |
| *Hail* | *GR* |
| ~~*— Reported when diameter of largest hailstones is 5 mm or more.*~~ | |
| ~~*Small hail and/or snow pellets*~~ | ~~*GS*~~ |
| ~~*— Reported when diameter of largest hailstones is less than 5 mm.*~~ | |

*b) Obscurations (hydrometeors)*

| | |
|---|---|
| *Fog* | *FG* |
| *— Reported when visibility is less than 1 000 m, except when qualified by "MI", "BC", "PR" or "VC" (see 4.8.5 and 4.8.6).* | |
| *Mist* | *BR* |
| *— Reported when visibility is at least 1 000 m but not more than 5 000 m.* | |

*c) Obscurations (lithometeors)*

*The following should be used only when the obscuration consists predominantly of lithometeors and the visibility is 5 000 m or less except "SA" when qualified by "DR" (see 4.8.5) and volcanic ash.*

| | |
|---|---|
| *Sand* | *SA* |
| *Dust (widespread)* | *DU* |
| *Haze* | *HZ* |
| *Smoke* | *FU* |
| *Volcanic ash* | *VA* |

*d) Other phenomena*

| | |
|---|---|
| *Dust/sand whirls (dust devils)* | *PO* |
| *Squall* | *SQ* |

| | |
|---|---|
| *Funnel cloud (tornado or waterspout)* | *FC* |
| *Duststorm* | *DS* |
| *Sandstorm* | *SS* |

4.8.5~~9~~ **Recommendation.—** *In local routine and special reports and in reports in the METAR/SPECI code forms, the characteristics of the present weather phenomena which should be reported, as necessary, and their respective abbreviations are as follows:*

*Thunderstorm* *TS*

*— Used to report a thunderstorm with rain "TSRA", snow "TSSN", ice pellets "TSPL", hail "TSGR" or small hail and/or snow pellets "TSGS" or combinations thereof, for example, "TSRASN". When thunder is heard or lightning seen or detected within 30 km from the aerodrome during the 10-minute period preceding the time of observation but no precipitation is observed at the aerodrome, the abbreviation "TS" should be used without qualification.*

*Shower* *SH*

*— Used to report showers of rain "SHRA", snow "SHSN", ice pellets "SHPL", hail "SHGR", small hail and/or snow pellets "SHGS", or combinations thereof, for example "SHRASN". Showers observed in the vicinity of the aerodrome (see 4.8.6) should be reported as "VCSH" without qualification regarding type or intensity of precipitation.*

*Freezing (supercooled water droplets or precipitation, used only with FG, DZ and RA)* *FZ*

*Blowing* *BL*

*— Used to report DU, SA or SN ~~(including snowstorm)~~ raised by the wind to a height of 2 m (6 ft) or more above the ground; in the case of snow, also used to report snow falling from a cloud and mixed with snow raised by the wind from the ground.*

| | |
|---|---|
| *Low drifting (used with DU, SA or SN raised by the wind to less than 2 m (6 ft) above ground level)* | *DR* |
| *Shallow (less than 2 m (6 ft) above ground level)* | *MI* |
| *Patches (fog patches randomly covering the aerodrome)* | *BC* |
| *Partial (a substantial part of the aerodrome covered by fog while the remainder is clear)* | *PR* |

4.8.~~6~~10 **Recommendation.—** *In local routine and special reports and in reports in the METAR/SPECI code forms, the relevant intensity or, as appropriate, the proximity to the aerodrome of the reported present weather phenomena should be indicated as follows:*

| | *(~~abbreviated plain language~~ local routine and special reports)* | *(METAR/SPECI)* |
|---|---|---|
| *Light* | *FBL* | *–* |
| *Moderate* | *MOD* | *(no indication)* |
| *Heavy* | *HVY* | *+* |

*— Used only with: precipitation; SH and TS (in these cases intensity refers to precipitation in accordance with 4.8.7); BLDU; BLSA; BLSN; DS; SS; and PO, FC (in these cases HVY means well developed).*

| | |
|---|---|
| *Vicinity* | *VC* |

*— Not at the aerodrome but not further away than approximately 8 km from the aero-drome perimeter and used only in reports in the METAR/SPECI code forms with DS, SS, FG, FC, SH, PO, BLDU, BLSA, BLSN and TS when not reported under 4.8.5.*

4.8.~~7~~11 **Recommendation.—** *In local routine and special reports and in reports in the METAR/SPECI code forms, one or more up to a maximum of three of the present weather abbreviations given in 4.8.4 and 4.8.5 should be used, as necessary, together with an indication, where appropriate, of the characteristics and intensity or proximity to the aerodrome, so as to convey a complete description of the present weather at or near the aerodrome of significance to flight operations. In reporting this information, the indication of intensity or proximity as appropriate, should be reported first followed respectively by the characteristics and the type of weather phenomena. Where two different types of weather are observed, they should be reported in two separate groups, where the intensity or proximity indicator refers to the weather phenomenon which follows the indicator. However, different types of precipitation occurring at the time of observation should be reported as one single group with the dominant type of precipitation reported first and preceded by only one intensity qualifier which refers to the intensity of the total precipitation.*

### 4.9 Observing and reporting of cloud or vertical visibility

4.9.1 ~~**Recommendation.—**~~Cloud amount, cloud type and height of cloud base ~~should~~ shall be observed, and reported as necessary to describe the ~~general~~ cloud distribution of operational significance, in accordance with 4.9.7. When the sky is obscured, vertical visibility shall be observed in lieu of cloud amount, cloud type and height of cloud base. The height of cloud base and vertical visibility shall be reported in metres (feet).

REPRESENTATIVENESS

4.9.~~3~~2 **Recommendation.—** *Cloud observations for local routine and special reports should be representative of the approach area or, in the case of aerodromes with precision approach runways, of the middle marker site of the instrument landing system.*

*Note.— Specifications concerning the middle marker site of an instrument landing system are given in Annex 10, Volume I, Chapter 3 and Attachment C, Table C-5.*

4.9.3 **Recommendation. —** *Cloud observations made for reports in the METAR/SPECI code forms should be representative of the aerodrome and its ~~immediate~~ vicinity.*

MANUAL INSERTION

4.9.~~2~~4 **Recommendation.—** *Where ~~ceilometers~~ observations of the height of cloud base are made ~~used as a part of automated~~ using automatic observing equipment ~~to measure height of cloud base~~, provision should be made for manual insertion of cloud amounts and, where appropriate, cloud type~~(s)~~, together with the heights of those layers or masses not directly measurable by ~~the ceilometer(s)~~ that equipment.*

— — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — —

SITING

4.9.5 **Recommendation. —** *When instrumented systems are used for the measurement of the height of cloud base, representative observations should be obtained by the use of sensors appropriately sited as determined by local conditions. Sensors for height of cloud base observations for local routine and special reports should be sited to give the best practicable indications of the height of cloud base at the middle marker site of the instrument landing system or, at aerodromes where a middle marker beacon is not used, at a distance of 900 to 1 200 m (3 000 to 4 000 ft) from the landing threshold at the approach end of the runway.*

DISPLAYS

4.9.6 **Recommendation. —***When instrumented systems are used for the measurement of the height of cloud base, displays of representative values of height of cloud base should be located in the meteorological station with corresponding displays in the appropriate air traffic services units.*

REPORTING

4.9.7 In local routine and special reports and in reports in the METAR/SPECI code forms, only clouds of operational significance, i.e. cumulonimbus clouds and clouds with heights of their bases below

1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater, shall be reported.

4.9.~~5~~8 ~~**Recommendation.** —~~ In local routine and special reports and in reports in the METAR/SPECI code forms, ~~the name of the element should be given together with~~

a) cloud amount shall be reported using the abbreviations "FEW" (1 to 2 oktas), "SCT" (3 to 4 oktas), "BKN" (5 to 7 oktas) or "OVC" (8 oktas)~~.~~;

b) cloud type shall be indicated for cumulonimbus clouds;

c) the height of cloud base and vertical visibility shall be reported in steps of 30 m (100 ft) up to 3 000 m (10 000 ft) and in steps of 300 m (1 000 ft) above 3 000 m (10 000 ft);

d) if there are no clouds and no restriction on vertical visibility and the abbreviation "CAVOK" is not appropriate, the abbreviation "SKC"~~should~~ shall be used~~.~~;

e) if there are no clouds of operational significance~~, i.e. below 1 500 m (5 000ft) or below the highest minimum sector altitude, whichever is greater,~~ no cumulonimbus and no restriction on vertical visibility and the abbreviations "CAVOK" and "SKC" are not appropriate, the abbreviation "NSC"~~ should~~ shall be used~~. When the sky is obscured and information on vertical visibility is available, it should be reported. as shown in the template in Appendix 2.~~;

f) when several layers or masses of cloud of operational significance are observed, their amount and height~~ should~~ of cloud base shall be reported in the following order:

~~a~~1) the lowest layer or mass, regardless of amount to be reported as FEW, SCT, BKN or OVC as appropriate;

~~b~~2) the next layer or mass, covering more than 2/8 to be reported as SCT, BKN or OVC as appropriate;

~~c~~3) the next higher layer or mass, covering more than 4/8 to be reported as BKN or OVC as appropriate;

~~d~~4) cumulonimbus (CB)~~ and/or towering cumulus clouds (TCU)~~, whenever observed and not reported in a) to c) above.

~~The type of cloud should be identified only for cumulonimbus and towering cumulus when observed at or near the aerodrome. The height of the base of cloud should be reported in steps of 30 m (100 ft) up to 3 000 m (10 000 ft) together with the units used and in steps of 300 m (1 000 ft) above 3 000 m (10 000 ft).~~

g) when the cloud base is diffuse or ragged or fluctuating rapidly, the minimum height of the cloud, or cloud fragments, ~~should~~ shall be reported.~~ given, followed by the relevant abbreviation . When an individual layer (mass) of cloud is composed of cumulonimbus and towering cumulus clouds with a common cloud base, the type of cloud should be reported as cumulonimbus only.~~

4.9.9 **Recommendation.** — *In local routine and special reports,*

*a) the units of measurement used for the height of cloud base should be indicated;*

*b) when there is more than one runway in use and cloud heights are observed by instruments*

*for these runways, the available cloud height values for each runway should be reported ~~given, as necessary,~~ and the runways to which the values refer should be indicated~~.~~;*

*c) cloud type should also be indicated for towering cumulus clouds (TCU).*

*Note.— Towering cumulus is used to indicate cumulus congestus clouds of great vertical extent.*

### 4.10 Observing and reporting of air temperature and dew-point temperature

4.10.1 ~~**Recommendation.—**~~ The air temperature and the dew-point temperature ~~should~~ shall be measured and reported to the nearest whole degree Celsius, with observed values involving 0.5°C rounded up to the next higher whole degree Celsius. ~~For example, +2.5°C should be rounded off to +3°C, −2.5°C should be rounded off to −2°C.~~

REPRESENTATIVENESS

4.10.2 **Recommendation.—** *Observations of air temperature and dew-point temperature for local routine and special reports and reports in the METAR/SPECI code forms should be representative of the whole runway complex.*

— — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — —

REPORTING

4.10.3 ~~**Recommendation.—**~~ In local routine and special reports, ~~the air temperature should be identified by "T" and the dew-point temperature by "DP". For~~ a temperature below 0°C ~~the value should~~ shall be preceded by "MS" .

4.10.4 In reports in the METAR/SPECI code forms, a temperature below 0° C shall be preceded by "M".

### 4.11 Observing and reporting of pressure values

4.11.1 ~~**Recommendation.—**~~ The atmospheric pressure ~~should~~ shall be measured and QNH and~~/or~~, QFE values ~~should~~ shall be computed in tenths of a hectopascal. QNH, and QFE when required in accordance with 4.11.4, shall be reported in hectopascals, using four digits, rounded down to the nearest lower whole hectopascal.

— — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — —

DISPLAY

4.11.2 QNH/QFE displays relating to the barometer shall be located in the meteorological station with corresponding displays in the appropriate air traffic services units. When QFE values are displayed for more than one runway, as specified in 4.11.3, the displays shall be clearly marked to identify the runway to which the QFE value displayed refers.

~~4.11.2 **Recommendation.—** *For local air traffic services units QNH and, if required, QFE*~~

~~*should be kept current by routine issues, supplemented by the issue of new data whenever changes occur which exceed an agreed magnitude. Such supplementary data need not be issued when the air traffic services unit is equipped with a remote indicator from the barometer in the meteorological station or with a separate barometer, and where arrangements are in force for the use of the remote display, or separate barometer, to make observations to meet the need for local routine and special reports.*~~

REFERENCE LEVEL

4.11.3 **Recommendation.—** *The reference level for the computation of QFE should be the aerodrome elevation. For non-precision approach runways, the thresholds of which are 2 m (7 ft) or more below the aerodrome elevation, and for precision approach runways, the QFE, if required, should refer to*
*the relevant threshold elevation.*

REPORTING

4.11.4 **Recommendation.—** *In local routine and special reports:*

*a)* *QNH should be included~~ regularly and~~;*

*b)* *QFE should be included either on request or, if so agreed locally, on a regular basis;*

*c)* *~~. Those~~ the units of measurement used for QNH and QFE values should be included; and ~~rounded down to the nearest lower whole hectopascal and given in four digits together with the units used~~.*

*d)* *If QFE values are required for more than one runway, the required QFE values~~ should be indicated using four digits~~ for each runway should be reported and the runways to which the values refer should be indicated.*

4.11.5~~ **Recommendation.—**~~ In reports in the METAR/SPECI code forms only QNH values ~~should~~ shall be included~~ and the values should~~ be~~ rounded down to the nearest lower whole hectopascal~~.

## 4.12 Observing and reporting of supplementary information

4.12.1 **Recommendation.—** *Observations made at aerodromes should include the available supplementary information concerning significant meteorological~~ conditions~~ phenomena, particularly those in the approach and climb-out areas~~, and specifically the location of cumulonimbus or thunderstorm, moderate or severe turbulence, wind shear, hail, severe squall line, moderate or severe icing, freezing precipitation, severe mountain waves, sandstorm, duststorm, blowing snow or funnel cloud (tornado or waterspout)~~. Where practicable, the information should identify the location,~~ vertical extent and direction and rate of movement~~ of the phenomenon.~~ As icing, turbulence and to a large extent, wind shear, for the time being cannot be satisfactorily observed from the ground, evidence of their existence should be derived from aircraft observations during the climb-out or approach phases of flight to be made in accordance with Chapter 5, 5.5 and 5.6.~~*

~~*Note.— The preparation and dissemination of warnings of wind shear in the climb-out and approach paths is dealt with in Chapter 7, 7.6.1 to 7.6.6.*~~

MANUAL INSERTION

4.12.2 **Recommendation.—** *Where observations are made using automatic observing equipment, provision should be made for manual insertion of information concerning significant meteorological conditions which cannot be determined adequately by that equipment.*

— — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — —

REPORTING

4.12.3 **Recommendation.—** *In local routine and special reports, and in reports in the METAR/SPECI code forms, ~~When any of~~ the following recent weather phenomena ~~or combinations thereof~~, i.e. weather phenomena ~~were~~ observed at the aerodrome during the period since the last issued routine report or last hour, whichever is the shorter, but not at the time of observation, ~~this~~ should be reported, up to a maximum of three groups, in the supplementary information:*

| | |
|---|---|
| — *freezing precipitation* | *REFZDZ, REFZRA* |
| — *moderate or heavy precipitation (including showers thereof)* | *REDZ, RERA, RESN, RESG, REGR, REPL, RESHRA, RESHSN, RESHSG, RESHPL, RESHGR, REIC* |
| — *moderate or heavy blowing snow ~~(including snowstorm)~~* | *REBLSN* |
| — *duststorm or sandstorm* | *REDS, RESS* |
| — *thunderstorm* | *RETS* |
| — *funnel cloud (tornado or water spout)* | *REFC* |
| — *volcanic ash* | *REVA*. |

4.12.4 **Recommendation.—** *~~The available supplementary information should be included~~ In local routine and special reports, ~~using~~ the following ~~abbreviations, or combinations thereof, for~~ significant meteorological phenomena should be reported in supplementary information:*

~~*a) cumulonimbus cloud and significant meteorological conditions:*~~

| | |
|---|---|
| — *cumulonimbus clouds* | ~~*"CB",*~~ |
| — *thunderstorm* | ~~*"TS",*~~ |
| — *moderate or severe turbulence* | ~~*"MOD TURB"*~~, ~~*"SEV TURB",*~~ |
| — *wind shear* | ~~*"WS",*~~ |
| — *hail* | ~~*"GR",*~~ |
| — *severe squall line* | ~~*"SEV SQL",*~~ |
| — *moderate or severe icing* | ~~*"MOD ICE"*~~, ~~*"SEV ICE",*~~ |
| — *freezing precipitation* | ~~*"FZDZ"*~~, ~~*"FZRA",*~~ |
| — *severe mountain waves* | ~~*"SEV MTW",*~~ |
| — *duststorm or sandstorm* | *DS*, ~~*"SS", "DS",*~~ |
| — *blowing snow* | ~~*"BLSN" or*~~ |
| — *funnel cloud (tornado or water spout)* | ~~*"FC",*~~. |

~~*b)*~~ *The location of the phenomenon should be indicated.*~~*: "IN APCH", "IN CLIMB-OUT" or "INC".; and*~~

~~*c) recent weather: "REFZDZ", "REFZRA", "REDZ", "RERA", "RESN", "RESG", "REGR", "REGS", "REPL", "RESHRA", "RESHSN", "RESHSG", "RESHPL", "RESHGR", "RESHGS", "REIC", "REBLSN", "RESS", "REDS", "RETS", "REFC" or "REVA".*~~

*Where necessary, additional information should be included using abbreviated plain language.*

4.12.5 **Recommendation.—** *In reports in the METAR/SPECI code forms, ~~information on recent weather of operational significance, as given in 4.12.3, observed at the aerodrome within the period since the last issued routine report or last hour, whichever is the shorter, but not at the time of observation and~~, where local circumstances so warrant, information on wind shear should be added~~, while other supplementary information should be added in such reports only in accordance with regional air navigation agreement~~.*

*Note.— The local circumstances referred to in 4.12.~~6~~5 include, but are not necessarily limited to, wind shear of a non-transitory nature such as might be associated with low-level temperature inversions or local topography.*

4.12.6 **Recommendation.—** *In reports in the METAR/SPECI code forms, the following information should be included, in accordance with regional air navigation agreement, in the supplementary information:*

*a) information on sea-surface temperature and the state of the sea~~ should be included in reports in the METAR/SPECI code forms~~ from aeronautical meteorological stations established on off-shore structures in support of helicopter operations~~, as determined by regional air navigation agreement.~~; and*

*Note.— The state of the sea is specified in WMO Publication No. 306,* Manual on Codes, *Volume I.1, Part A — Alphanumeric Codes, Code Table 3700.*

~~4.12.7 **Recommendation.—**~~

*b) information on the state of the runway provided by the appropriate airport authority~~ should be included in reports in the METAR/SPECI code forms in accordance with regional air navigation agreement~~.*

*Note.— The state of the runway is specified in WMO Publication No. 306,* Manual on Codes, *Volume I.1, Part A — Alphanumeric Codes, Code Table 0370, 0519, 0919 and 1079.*

## 4.13 Contents of reports

4.13.1 ~~**Recommendation.—**~~ Local routine and special reports and routine and special reports in the METAR/SPECI code forms ~~should~~ shall contain the following information in the order indicated, except that local special reports need not contain information as provided for under 4.3.3:

a) identification of the type of report;

b) location indicator;

c) time of the observation;

d) surface wind direction and speed;

e) visibility;

f) runway visual range, when applicable;

g) present weather;

h) cloud amount, cloud type (only for cumulonimbus~~ and towering cumulus~~ clouds~~ at or near the aerodrome~~) and height of cloud base;

i) air temperature and dew-point temperature;

j) QNH and, when applicable, QFE (QFE included only in local routine and special reports by agreement between the meteorological and air traffic services authorities and operators concerned);

~~k) supplementary information.~~

*Note ~~1~~.— The location indicators referred to under b) and their significations are published in ICAO Doc 7910* — Location Indicators.

~~Note 2.— For explanation of towering cumulus see note following 4.9.5.~~

4.13.2 **Recommendation.** — *In addition to elements listed under 4.13.1 a) to j), local routine and special reports and routine and special reports in the METAR/SPECI code forms should contain supplementary information in accordance with 4.12 to be appended as the last element of the report.*

4.13.3 **Recommendation.** — *In addition to elements listed under 4.13.1 a) to j) and in 4.13.2, local routine and special reports should contain cloud type for towering cumulus clouds.*

— — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — —

4.13.~~2~~3 When the following conditions obtain simultaneously at the time of observation:

a) visibility, 10 km or more;

b) no cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater, and no cumulonimbus;

c) no weather of significance to aviation as given in 4.8.4 and 4.8.5;

information on visibility, runway visual range, present weather and cloud amount, type and height shall be replaced in all meteorological reports by the term “CAVOK”.

## APPENDIX 2 TO ANNEX 3

| | |
|---|---|
| *Editorial Note: —* | *Introduce* under the "Template for the local routine (MET REPORT) and local special (SPECIAL) reports" the following note: |

*Note.— The explanations for the abbreviations used can be found in the* Procedures for Air Navigation Services — ICAO Abbreviations and Codes *(PANS-ABC, Doc 8400).*

| | |
|---|---|
| *Editorial Note: —* | *Introduce* under the "Template for reports in the METAR/SPECI code forms" the following note: |

*Note.— The explanations for the abbreviations used can be found in the* Procedures for Air Navigation Services — ICAO Abbreviations and Codes *(PANS-ABC, Doc 8400).*

## APPENDIX 4 TO ANNEX 3

| | |
|---|---|
| *Editorial Note: —* | *Introduce* under the "Template for aerodrome forecasts in the TAF code form" the following note: |

*Note.— The explanations for the abbreviations used can be found in the* Procedures for Air Navigation Services — ICAO Abbreviations and Codes *(PANS-ABC, Doc 8400).*

— — — — —

# APPENDIX D

## AMENDMENT PROPOSALS TO CHAPTER 4 (relevant parts) OF ANNEX 3

## INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

## METEOROLOGICAL SERVICE FOR INTERNATIONAL AIR NAVIGATION

## PROPOSED AMENDMENT TO ANNEX 3 INTRODUCING "PREVAILING VISIBILITY" BASED ON THE CONSOLIDATED AMENDMENT 72 TO ANNEX 3 (given in Appendix A)

**NOTE:**
**still subject to adoption by ICAO Council and WMO Executive Council**
**(applicable November 2001)**

## CHAPTER 1. DEFINITIONS

• • • • •

***Prevailing visibility.*** The visibility value, observed in accordance with the definition of "visibility", which is reached or exceeded within at least half the horizon circle. The half horizon circle could comprize different contiguous or non-contiguous sectors.

• • • • •

## CHAPTER 4. METEOROLOGICAL OBSERVATIONS AND REPORTS

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### 4.3 Special observations, special reports and selected special reports

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4.3.4 **Recommendation. —** *Special reports in the SPECI code form should be issued whenever changes in accordance with the following criteria occur:*

• • • • •

*e) when the prevailing visibility is improving and changes to or passes through one or more of the following values, or when the visibility is deteriorating and passes through one or more of the following values:*

*1) 800, 1 500 or 3 000 m;*

*2) 5 000 m, in cases where significant numbers of flights are operated in accordance with the*

*visual flight rules;*

• • • • •

### 4.6 Observing and reporting of visibility

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4.6.5~~9~~ **Recommendation.—** *In reports in the METAR/SPECI code forms, when the visibility is not the same in different directions:*

*a) the ~~lowest~~ prevailing visibility should be reported~~.~~; ~~When the visibility is not the same in different directions and~~*

*b) when the prevailing visibility is 5 000 m or less and the lowest visibility in one or more directions is ~~more~~ less than 50 per cent ~~above~~ of the ~~lowest~~ prevailing visibility, the lowest visibility observed should also be reported and its general direction in relation to the site of the meteorological station indicated by reference to one of the eight points of the compass. If the lowest visibility is observed in more than one direction, then the most operationally significant direction should be reported~~.~~; and*

~~*Directional variations in visibility should be reported when the lowest visibility is less than 1 500 m and the visibility in another direction is more than 5 000 m. Where such variations in visibility are observed in more than one direction, then the most operationally significant direction should be reported.*~~

*c) when the visibility is fluctuating rapidly, and ~~significant directional variations~~ the prevailing visibility cannot be ~~given~~ determined, only the lowest visibility should be reported, with no indication of direction.*

• • • • •

## CHAPTER 6. FORECASTS

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6.2.3 Aerodrome forecasts and amendments thereto shall be issued in accordance with the template shown in Appendix 4 and exchanged in the TAF code form and include the following information in the order indicated:

a) code name TAF/TAF AMD;

b) location indicator;

c) date and time of origin of forecast;

d) date and period of validity of forecast

e) surface wind;

f) visibility;

g) weather;

d) cloud; and

i) expected significant changes to one or more of these elements during the period of validity.

Additional elements shall be included in aerodrome forecasts in accordance with regional air navigation agreement.

*Note.1 — The TAF code form is contained in WMO Publication No. 306,* Manual on Codes, *Volume I.1, Part A — Alphanumeric Codes.*

*Note.2 — Examples of aerodrome forecasts in the TAF code form are given in Appendix 4.*

*Note 3. - The visibility included in aerodrome forecasts refers to the forecast prevailing visibility.*

• • • • •

6.3.3 A trend-type landing forecast shall consist of a local routine or local special report; or a routine or special report in the METAR/SPECI code forms for an aerodrome to which is appended a concise statement of the expected trend of the meteorological conditions at the aerodrome. The period of validity of a trend-type landing forecast shall be 2 hours from the time of the report which forms part of the landing forecast. The trend-type landing forecast shall indicate significant changes in respect of one or more of the elements surface wind, visibility, weather and cloud. Only those elements shall be included for which significant change is expected. However, in the case of significant changes in respect of cloud, all cloud

groups, including layers or masses not expected to change, shall be indicated. In the case of a significant change in visibility, the phenomenon causing the reduction of visibility shall also be indicated. When no change is expected to occur, this shall be indicated by the term “NOSIG”.

*Note. - The visibility included in trend-type landing forecasts refers to the forecast prevailing visibility.*

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**ANNEX 2**
**RULES OF THE AIR**

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**CHAPTER 1. DEFINITIONS**

• • • • •

***Ground visibility.*** The visibility at an aerodrome as reported by an accredited observer or by the aeronautical meteorological station.

• • • • •

*Editorial Note: — Add* after the definition of visibility the following note:

*Note 2. - The definition applies to the observations of visibility in local routine and special reports, to the observations of prevailing visibility reported in reports in the METAR/SPECI code forms and to the observations of ground visibility.*

**PROCEDURES FOR AIR NAVIGATION SERVICES**
**RULES OF THE AIR**
**AND**
**AIR TRAFFIC SERVICES (DOC 4444)**

## CHAPTER 1. DEFINITIONS

• • • • •

*Editorial Note: — Add* after the definition of visibility the following note:

*Note 2. - The definition applies to the observations of visibility in local routine and special reports, to the observations of prevailing visibility reported in reports in the METAR/SPECI code forms and to the observations of ground visibility.*

• • • • •

## PART IX. AIR TRAFFIC SERVICES MESSAGES

• • • • •

4.3 Flight information messages

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4.3.2 *Messages containing meteorological information*

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4.3.2.3.2 *Visibility, including significant directional variations*

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4.3.2.3.2.3 In meteorological reports disseminated beyond the aerodrome, the visibility shall be representative of the aerodrome and its ~~immediate~~ vicinity. In the case of significant directional variations in visibility:

a) the ~~lowest~~ prevailing visibility shall be reported; and

b) an additional value~~s~~ of the lowest visibility shall be given with an indication~~s~~ of the direction of observation.

— — — — —

## APPENDIX E

## LIST OF TASKS FOR FUTURE WORK OF THE AERODROME METEOROLOGICAL OBSERVING SYSTEMS STUDY GROUP (AMOSSG)

The AMOSSG is envisaged to assist the Secretariat in pursuing the specific tasks as follows:

| TASK NO. | TASK (ANNEX 3 PROVISIONS WHICH MAY NEED TO BE AMENDED INDICATED IN BRACKETS) | REFERENCE | ESTIMATED DATE FOR COMPLETION | RESPONSIBILITY (LEAD IN BOLD) | NOTE ON PROGRESS |
|---|---|---|---|---|---|
| 1. | Review of operational requirements in Chapter 4 to Annex 3<br><br>(Annex 3, Chapter 4) | AMOSSG/1 – SoD, Section 4 | end 2001 | AMOSSG | initial reviews undertaken at the AMOSSG/1 and AMOSSG/2 Meetings (AMOSSG/2-SoD App. C refers) |
| 2. | Introduction of "prevailing visibility" (including the revision of the reporting of visibility in local reports and reports in the METAR/SPECI code forms)<br>(Annex 3, 4.6.2-4.6.5) | AMOSSG/1 – SoD, 4.4.1 c) | end 2001 | AMOSSG | initial proposal presented to AMOSSG/2 Meeting (AMOSSG/2-SoD App. D refers) |
| 3. | Reassessment of the light intensity to be used to assess RVR in reports in the METAR/SPECI code forms<br>(Annex 3, 4.7.11) | AMOSSG/1 – SoD, 4.4.1 d) | end 2001 | Marc, Michel | a paper expected for consideration by AMOSSG/3 Meeting |
| 4. | Use of modern observing techniques (e.g. remote sensing)<br>(Annex 3, definitions (if necessary), 3.5.2 a) & a new section under Chapter 4) | AMOSSG/1 – SoD, 4.4.1 a); 4.4.3 | end 2001 | Michel | a proposal, as necessary, expected for AMOSSG/3 Meeting |
| 5. | Revision of the weather phenomena to be reported under "present weather" and "recent weather"<br>(Annex 3, 4.8.4 - 4.8.6 & 4.12.3) | AMOSSG/1 – SoD, 5.3.1 c) | end 2001 | **Earle**, Jean-Paul, Kevin, Pete, Will, Bryan | initial proposal presented at the AMOSSG/2 Meeting |
| 6. | Monitoring of results from research on the automatic detection of cloud types<br>(Annex 3, 4.9.5) | AMOSSG/1 – SoD, 5.3.1 e) | continuing | AMOSSG | also to be discussed at WMO PROMET |

| TASK NO. | TASK (ANNEX 3 PROVISIONS WHICH MAY NEED TO BE AMENDED INDICATED IN BRACKETS) | REFERENCE | ESTIMATED DATE FOR COMPLETION | RESPONSIBILITY (LEAD IN BOLD) | NOTE ON PROGRESS |
|---|---|---|---|---|---|
| 7. | Finalization of the assessment of the capability of AWS to meet the ex-pected future requirements (Annex 3, 4.1.10, 4.6.2, 4.8.2, 4.9.2 & 4.12.2) | AMOSSG/1 – SoD, 6.2.2 b) | continuing | AMOSSG | assessments carried out at AMOSSG/1 and AMOSSG/2 Meetings (AMOSSG/1–SoD 5.3.1 refers) |
| 8. | Specific tasks concerning the use of "VC" (Annex 3, 4.8.6) | AMOSSG/1 – SoD, 5.3.1 d) | end 2001 | to be dealt with under Task 7 | initial proposals presented at the AMOSSG/2 Meeting |
| 9. | Preparation of guidance material | AMOSSG/1 – SoD, 5.3.1 e) | after the MET Divisional Meeting (2002) | AMOSSG | draft outline presented at the AMOSSG/2 Meeting |
| 10. | Intensity thresholds for weather phenomena established by WMO | AMOSSG/1 – SoD, 5.3.1 c) | AMOSSG/2 Meeting | Saad | |
| 11. | Availability of METARs and SPECIs for pre-flight planning purposes prior to the opening of the aerodrome | EANPG Concl. 42/17 | end 2001 | Secretary | new sub-task |
| 12. | Use of automated meteorological reports as a replacement of METARs and SPECIs during non-operational hours | EANPG Concl. 42/17 | end 2001 | Secretary | new sub-task |
| 13. | Cancellation of aerodrome forecasts where they cannot be reviewed and revised | EANPG Concl. 42/14 | end 2001 | Secretary | new sub-task |
| 14. | Reporting steps for visibility between 3 and 10 km | AMOSSG/3 – SoD, 3.5.4 | end 2001 | Ossi | new sub-task |
| 15. | Terminology used in association with RVR (observe *vs*. assess) | AMOSSG/3 – SoD, 3.6.1 | end 2001 | Secretary | new sub-task |
| 16. | Reference to take-off operations under the requirements to observe RVR | AMOSSG/3 – SoD, 3.6.2 | end 2001 | Secretary in coordination with OPS experts | new sub-task |

| TASK NO. | TASK (ANNEX 3 PROVISIONS WHICH MAY NEED TO BE AMENDED INDICATED IN BRACKETS) | REFERENCE | ESTIMATED DATE FOR COMPLETION | RESPONSIBILITY (LEAD IN BOLD) | NOTE ON PROGRESS |
|---|---|---|---|---|---|
| 17. | Migration to table-driven codes | AMOSSG/3 – SoD, 3.15.2 | continuing | Secretary | new sub-task |
| 18. | Development of provisions for automated detection of prevailing visibility | AMOSSG/3 – SoD, 3.12.4 | end 2001 | Secretary | new sub-task |

— END —