MANOBS

Manual of Surface Weather Observations

OBS 2-99 PROCEDURES FOR OBSERVING, REPORTING AND RECORDING FREEZING FOG AND FOG

Originating Authority: National Weather Services Directorate issued under the authority of the Assistant Deputy Minister

Available by mail from:

The Assistant Deputy Minister
Atmospheric Environment Service
4905Dufferin Street
Downsview, Ontario
M3H 5T4

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ce manuel est disponible en français

Appendix 1 - Valid OBS Circulars

The purpose of this Appendix is to hold copies of valid OBS circulars. OBS circulars have been issued primarily:
a) to provide instructions concerning new or revised observing procedures and or new equipment, and
b) to provide temporary or interim instructions
OBS circulars are normally cancelled by including their subject material in a subsequent amendment to MANOBS. This page will be updated every time a new OBS circular is issued. OBS circulars other than these listed below should not be held in this manual

List of Valid OBS Circulars

The present list of valid OBS circulars comprises circulars which have been issued more for specific users than for general purposes. For example, OBS 4-78 applies only to stations where observers Are required to communicate with pilots on a UNICOM frequency. Thus, if you do not have one or more of the circulars listed above and are not sure if you need it or not, check with your Regional office for advice before requesting a copy.

Environment Canada | Environnement Canada

Memorandum - Note de service

To/À MANOBS DISTRIBUTION
TOUS les détenteurs du MANOBS

Prepared by/ Préparé par:

Security/ Sécurité: UNCLASSIFIED
SANS CLASSIFICATION

From/ De Director General/Directeur général adjoint
Atmospheric Monitoring & Water Survey
Directorate/Direction générale de la
surveillance atmosphérique
et des relevés hydrologiques

File/ Dossier:

Date: October 1, 1999
le 1er octobre 1999

Subject/ Objet:

MANOBS (Manual of Surface Weather Observations) OBS 2-99 Procedures for Observing, Reporting and Recording Freezing Fog and Fog

1. Attached is OBS 2-99 "Procedures for Observing, Reporting and Recording Freezing Fog and Fog". These new observing procedures take effect November 1, 1999 at 0000 UTC. Please replace the listing of valid OBS Circulars with the new listing provided.

2. Please direct all inquires about the content to the following: Manager - Data Standards and Quality Management Division
Atmospheric Environment Service
4905 Dufferin, Street
Downsview, Ontario
M3H 5T4
416-739-4958

MANOBS (Manuel d'observations météorologiques de surface) OBS 2-99 : Méthodes d'observation, de communication et d'enregistrement du brouillard et du brouillard verglaçant

1. Veuillez trouver, ci-joint, la circulaire OBS 2-99 : Méthodes d'observation, de communication et d'enregistrement du brouillard et de brouillard verglaçant. Ces nouvelles procédures d'observation entrent en vigueur le 1er novembre 1999 à 0000 UTC. Veuillez remplacer la liste des circulaires OBS en vigueur par la nouvelle liste fournie.

2. Veuillez adresser vos questions au sujet du contenu à : Chef - Division des normes des données et du contrôle de la qualité,
Service de l'environnement atmosphérique
4905 rue Dufferin
Downsview, Ontario
M3H 5T4
416-739-4958

Barry D. Greer
Director General/Directeur général adjoint
Atmospheric Monitoring & Water Survey Directorate/
Direction générale de la surveillance atmosphérique
et des relevés hydrologiques

OBS 2-99

NOVEMBER 1999

PROCEDURES FOR OBSERVING, REPORTING AND RECORDING FREEZING FOG AND FOG

PURPOSE

Fog and freezing fog are obstructions to vision consisting of a suspension of very small water droplets or ice crystals in the air. This OBS Circular describes new procedures for reporting the various forms of "fog" and provides a description, methods of identification and the significance of the phenomena to aviation. The differences in these phenomena become apparent when they are considered with visibility, temperature and state of moisture content. This circular is provided as an addendum to *MANOBS 7th Edition* paragraphs 10.2.10. and 10.4.2

OBSERVER DUTIES

1. EFFECTIVE 0000Z NOVEMBER 1, 1999, THE OBSERVER SHALL:

A. Observe the elements freezing fog (FZFG) and fog (F) according to the ***prescribed criteria*** given below and the guidance material given in section 2. Observed Elements - Definitions and section 3. METAR information;

B. Cease all observation, reporting and recording of the element ice fog (***IF***);

C. Record F or FZFG in column 32 of form 2322 and enter in the data entry screen as appropriate;

D. Record in columns 2, 3 and 4 of the Surface Weather Record (form 2322) each occurrence of fog and freezing fog, alone or in combination with other phenomena if observed when the visibility is ½ mile or less.

E. Record F in column 40 for freezing fog as appropriate.

1.1 PRESCRIBED CRITERIA FOR OBSERVING THE ELEMENTS FREEZING FOG AND FOG:

Any fog shall be reported as freezing fog (FZFG) when:
The temperature is in the range -0.1 to -30.0°C **AND** the visibility is ½ statute mile or less.
OR
At temperatures colder than -30°C, when there is clear physical evidence of ice accretion from the fog **AND** the visibility is ½ statute mile or less
Any fog shall be reported as fog (F) when:

- At any temperature and the visibility is in the range 5/8 to 6 miles inclusive
- The temperature is warmer than or equal to 0.0°C and the visibility is 1/2SM or less

- The temperature is less than -30.0°C and there is no clear physical evidence of ice accretion and the visibility is 6 miles or less

Note: In the event that fog is occurring and there is clear physical evidence of ice accretion on the indicator, include a remark as to the type of icing that is occurring. For example: FROIN, RIME ON INDICATOR, etc.

2. OBSERVED ELEMENTS - DEFINITIONS

Fog (F) - Fog is a visible aggregate of minute water particles (droplets) or ice crystals which are based at the earth's surface and suspended in the air, they do not fall to the ground. In Canada fog must reduce the visibility to 6 miles or less to be reported. For observing purposes fog may be reported at any temperature above and below zero when reducing the visibility to 0 to 6 miles inclusive. Observers are cautioned that a report of fog (F) implies that the fog does not contain any super-cooled water droplets. At very cold temperatures, the existence of "light pillars" is a good indication that the fog is composed of ice crystals and therefore should be reported as fog (F).

Freezing Fog (FZFG) - This is a sub definition of fog and is specifically for use in METAR to alert the aviator to the possibility of airframe icing (refer to section 2.1).

- Freezing fog is a visible aggregate of minute, predominately supercooled water droplets which are based at the earth's surface and do not fall to the ground;
- Freezing fog must reduce the visibility to ½ statute mile or less and the air temperature must be below 0°C;
- Freezing fog usually occurs in the temperature range 0 to -30°C and may occur at temperatures down to as low as -40°C;
- Freezing fog may not always deposit rime or glaze on the "Ice Accretion Indicator", however if rime or glaze are evident, it positively indicates the presence of super-cooled water droplets and thus freezing rain, freezing drizzle or freezing fog is occurring;
- Freezing fog creates a significant risk of airframe icing and is therefore very important operational information for forecasters, pilots, flight service specialists, observers, communicators and others.

2.1 LIQUID CONTENT O F FOG, TEMPERATURE AND ICING

The amount of airframe icing is determined by a number of factors, namely: temperature, rate of catch, moisture content, airframe design and length of exposure.

Icing is always potentially serious as it can cause aircraft accidents.

Fog at above freezing temperatures does not cause icing events. However, when the temperature is less than 0°C, icing situations may arise. Droplets of water remaining liquid at temperatures below freezing are said to be ***super-cooled*** and it is these droplets that can cause serious icing problems. As water droplets are cooled, they do not necessarily freeze when the temperature

reaches 0°C. There is a limit to how much they can be cooled without freezing and this limit depends on the droplet size.

Large droplets freeze at temperatures only slightly below freezing while very small droplets may not freeze until the temperatures approaches -40°C. Below -40°C very few if any droplets exist, thus it is likely that any fog at this temperature contains only ice particles which pose no potential for icing.
The liquid content (super-cooled droplets) and therefore the potential for icing is low at temperatures below -30°C and is usually non-existent at -40°C.

3. METAR INFORMATION

The following METAR elements are not directly encoded by the observer, rather they are created by encoding software and displayed in the METAR report:

FG (Fog) - A visible aggregate of minute water particles (droplets) or ice crystals which are based at the earth's surface and suspended in the air, they do not fall to the ground. FG must reduce the visibility to ½ statute mile or less. In the case of FG in the METAR there should be no risk of airframe icing. In Canada, FG is automatically encoded in the METAR by software when fog (F) is reported and the visibility is 1/2 statute mile or less and the temperature is 0°C and above or below -30°C.

BR (Mist) - This is a sub definition of fog and is specifically for use in METAR. BR is a visible aggregate of minute water particles (droplets) or ice particles suspended in the air and are based at the earth's surface, they do not fall to ground. In Canada, BR is automatically encoded in the METAR by software when fog (F) is reported and the visibility is 5/8 to 6 statute miles inclusive. In the METAR code there is no such term as freezing mist.

3.1 METAR ENCODING S OFTWARE

In Canada the weather observer is required to report various weather elements which may or may not be specific to the METAR codes, however all elements that are reported are used to provide meteorological information for a variety of users. Environment Canada receives the weather elements that the observer inputs and uses centrally located computers to create and distribute METAR observations for aviation users.

Note: Due to Y2K constraints on WinIDE software, the input of FZFG has limited quality control checks available. Observers should be aware that freezing fog is to be reported only when the temperature is -0.1°C and colder and the visibility is 1/2SM or less.