

# Aviation Meteorological Forecaster Competency 1

Analyse and diagnose the weather  
situation as required in forecast and  
warning preparation

Low stable cloud and poor visibility

(AMF AC 1.1 and 1.2)

Jannie Stander  
RTC  
Pretoria



# OBJECTIVES OF THIS PRESENTATION

## At the end of this presentation you will be able to:

- **Analyse** low stable layered cloud and poor visibility from observational and remotely sensed data and determine its impact on observed warnings.
- **Diagnose** what dominant weather system/s is/are causing the low stable layered cloud and poor visibility.
- **Determine** the movement of this weather system/s and low stable layered cloud and poor visibility into the following day.



# Introduction

As per AMF AC 1.1, the first step in the forecasting process is to:

**Analyse and diagnose the weather situation as required in forecast and warning preparation**

There are 3 questions related to each of the 3 objectives of this presentation, which address the analysis (what is currently happening in the weather?) and the diagnosis (Why is the weather happening?) with regards to the low cloud and poor visibility.

Once you have answered the 3 questions competently, you will have provided evidence towards AMF competency 1.

Once you have mastered competency 1, you may then proceed to competency 2 and 3 which is to forecast and warn for hazardous aviation weather.

# Question 1 – **Analyse** low stable layered cloud and poor visibility from observational and remotely sensed data and its impact on observed warnings.

## For 4 marks:

Identify, if and where, **significant stable layered BKN/OCV low cloud causing poor visibility** is located referring to all available observational and remotely sensed data (Remember in aviation the word **significant** has specific meaning which can be quantified).

## TIP: When answering be sure to address the following:

**1.1** Refer to latest available **DNC /DM RGB satellite image** and refer explicitly to geographical locations/provinces/airports where significant BKN/OVC low cloud and poor visibility is observed - **(1 mark)**

**1.2** Refer to latest METARs that indicate BKN/OVC cloud base height close to **1500 ft a.g.l**) and visibility **≤ 5000m** (Remember values close to these thresholds might also be significant to include). Just copy and paste all the relevant ones - **(1 mark)**

**1.3** Refer to latest Tephigram/Skew T/AMDAR indicating BKN/OVC cloud derived from the common-sense method to identify the low cloud base height, vertical extent, cloud top as well as stability. Also link the onshore flow in the wind profile to the low cloud and identify possible wind shear in the vertical wind profile - **(1 mark)**

**1.4** Refer to any **observed** AIRMETs caused in the low levels (<FL150) by the **significant stable BKN/OCV low level layered cloud, poor visibility and turbulence** **(1 mark)**



# Question 1- Answer

## Answer:

### 1.1 Satellite

Yes there is BKN to OVC low stratiform cloud over the Eastern Cape, KZN, Mpumalanga Highveld, escarpment of Limpopo and around north of Walvisbay on Namibian coast observed on the DNC RGB. There is BKN to OVC low Stratiform cloud In this low cloud mist/fog/drizzle is possible. (DM RGB shows small water droplets).

### 1.2 METARs/SPECI

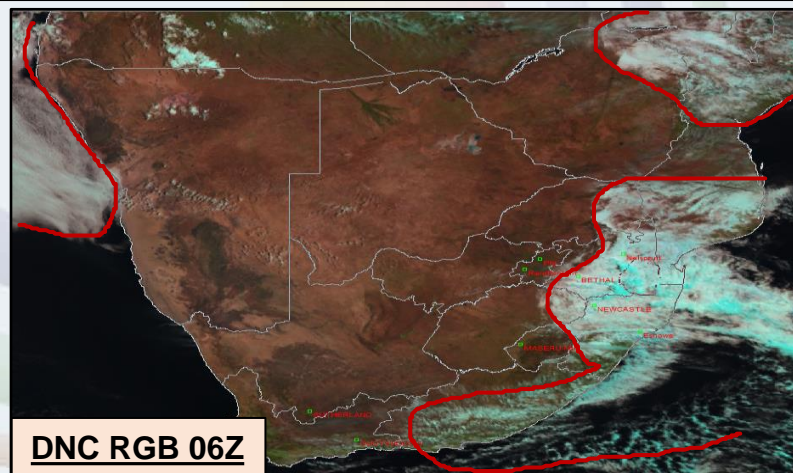
Walvis bay is reporting FEW008 (800 ft a.g.l) at 06Z.

METAR FABM 200800Z 10015G26KT 9999 **BKN018** 14/08 Q1028=

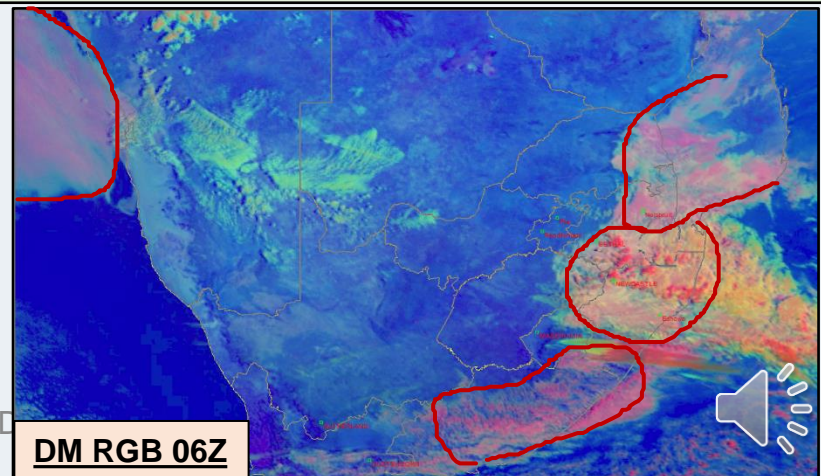
METAR FAEO 200800Z 10016KT **4000 BCFG OVC010** 11/10 Q1028=

METAR FAKN 200800Z 14010KT 9999 **BKN008 OVC015** 16/14 Q1026 BECMG BKN012=

METAR FQLC 200800Z 09013KT 060V130 9999 **BKN015** 22/17 Q1022=



ES-TEMP-003.2  
029.2\_LLcloud



# Question 1 - Answer

## 1.3 Tephigram/Skew T diagram/AMDAR of interest

Some moisture at Cape Town in low levels with SE'ly flow Tephigram fairly stable.

## 1.4 Observed AIRMETs for the Johannesburg FIR are:

**OBS SFC VIS < 5000m** - due to mist/drizzle/fog/light rain over eastern escarpment.

Sat image and METARs indicate cloud bases close or below 1000ft a.g.l and FAEO vis<5000m.

**OBS MT OBSC** - eastern escarpment

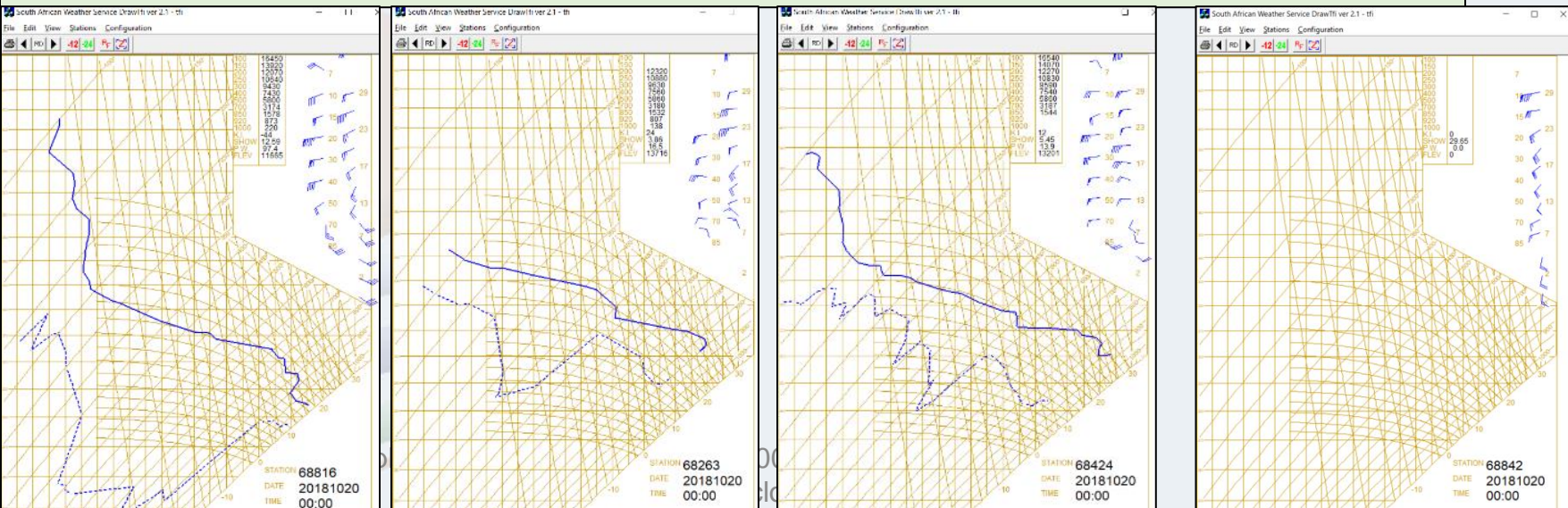
**OBS BKN CLD <1000ft** over eastern escarpment (cloud close to ground)

**No OBS Airmet** for widespread surface wind speed >30kt

**No observed** low level wind shear

**No OBS Airmet** for moderate turbulence

Need to investigate moderate aircraft icing along cold front.



## Question 2 – **Diagnose** what dominant weather system/s is/are causing the low stable layered cloud and poor visibility at the moment/now

### For 1 mark

Identify, name and discuss, the dominant **low level weather system/s (ocean and land) at F+06** affecting the weather and causing the **observed significant low-level cloud and poor visibility** in **Q1**?

**TIP: When answering be sure to address the following:**

Refer to NWP (MSLP and 10m winds/850 winds) valid closest to the time of the latest satellite observation (**F+06**) to support your answer discussion

## Question 2: Answer

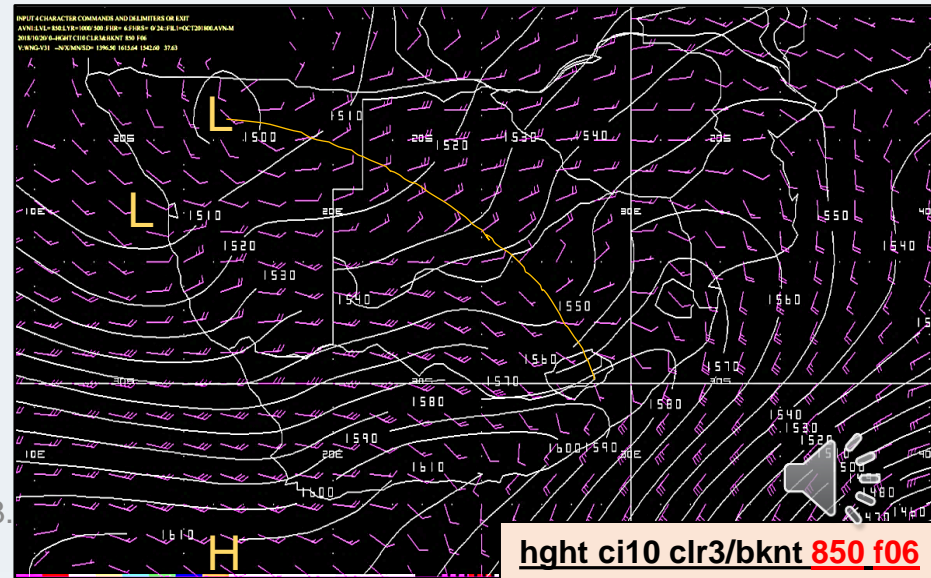
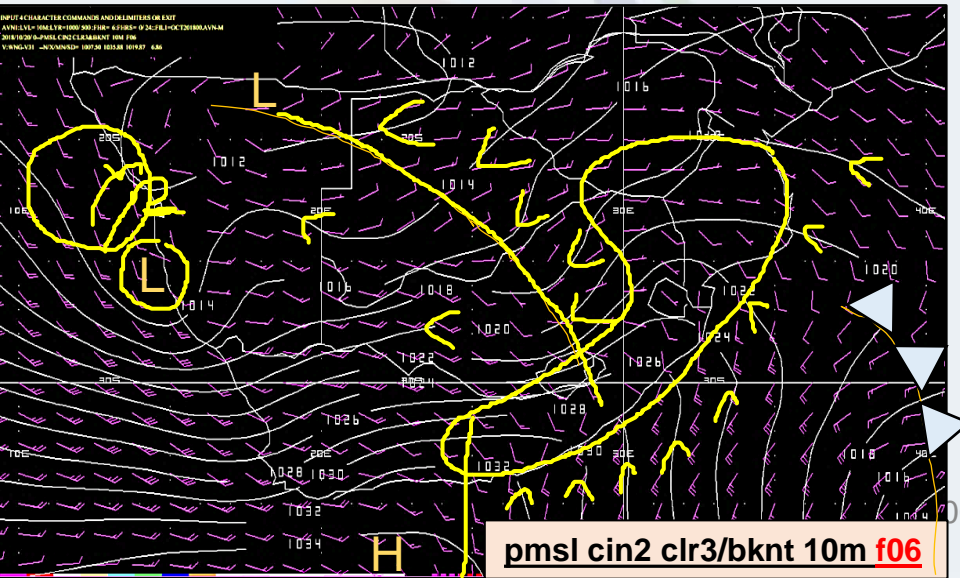
### Low Level (LL) Weather System causing low cloud and poor vis – F+06

#### Answer:

The dominant low level weather system is a **cold front** located over KZN/Swaziland extending to the south-east of the country followed by a stable **ridging high pressure system** with a moist low level onshore flow of air from the Indian Ocean, causing the low stratiform stable cloud observed on the DNC RGB over the eastern part of the country.

**A coastal low** on the Namibian coast north of Walvisbay is producing low cloud due to the onshore flow.

There is a **surface low** over the border of Namibia/Angola which extends into a **surface trough** over central Botswana into Gauteng (GPM and wind structure).





**Question 3: Determine the movement of this weather system/s and low stable layered cloud and poor visibility into the following day (F+12 and F+36).**

**For 2 marks**

**3.1** Explain the **movement** of this/these dominant low level **weather system/s** and its affect on the **forecast amount (BKN/OVC) and horizontal extent** of significant stable low layered cloud and poor visibility in the **next 4 to 6 hours** and its affect on AIRMET/SIGMET warnings) **1 Mark**

**TIP:** Refer to NWP 850 hPa level (GPM, wind and RELH) valid for **(F+12)** to support your answer discussion for today weather.

**3.2** Explain the **movement** of this/these dominant low level **weather system/s** and its affect on the **forecast amount (BKN/OVC) and horizontal extent** of significant stable low layered cloud and poor visibility in the next 30 hours (used for international TAFs) **1 Mark**

**TIP:** Refer to NWP 850 hPa level (GPM, wind and RELH) valid **(F+36)** to support your answer discussion for tomorrow's weather.





# Question 3: Answer

## Movement of LL Weather System and cloud to F36

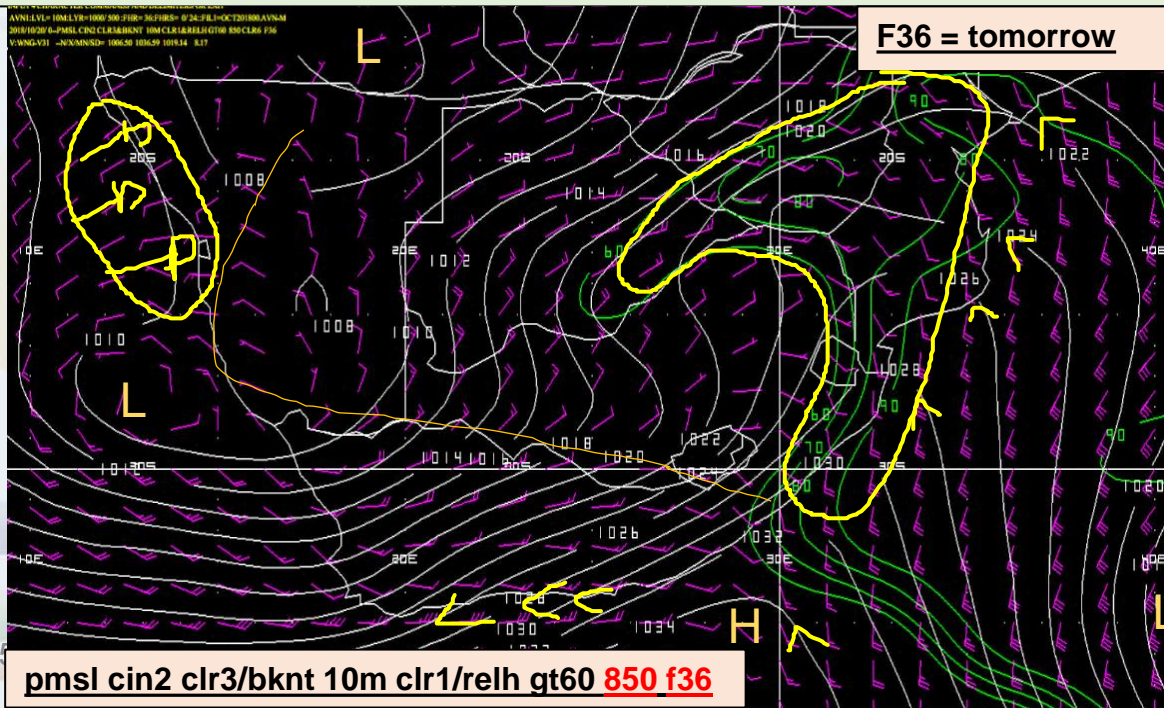
### 3.2 Answer:

#### For Tomorrow (F+36):

**high** moves slightly eastwards with the onshore flow is limited the to the extreme north-eastern parts of the country where low cloud will still be present in the morning while the flow becomes more parallel along the E Cape coast clearing the low cloud.

**low** in N Namibia moves s-westwards and off the coast of Namibia causing the onshore flow and BKN/OVC low cloud to spread southwards to entire coast.

**Surface trough** located in Namibia extending into the E part of the northern Cape which might make this area more favorable for convective cloud.



South African  
Weather Service

