

### Case 3

Route: East Midlands to Cambridge (VFR)

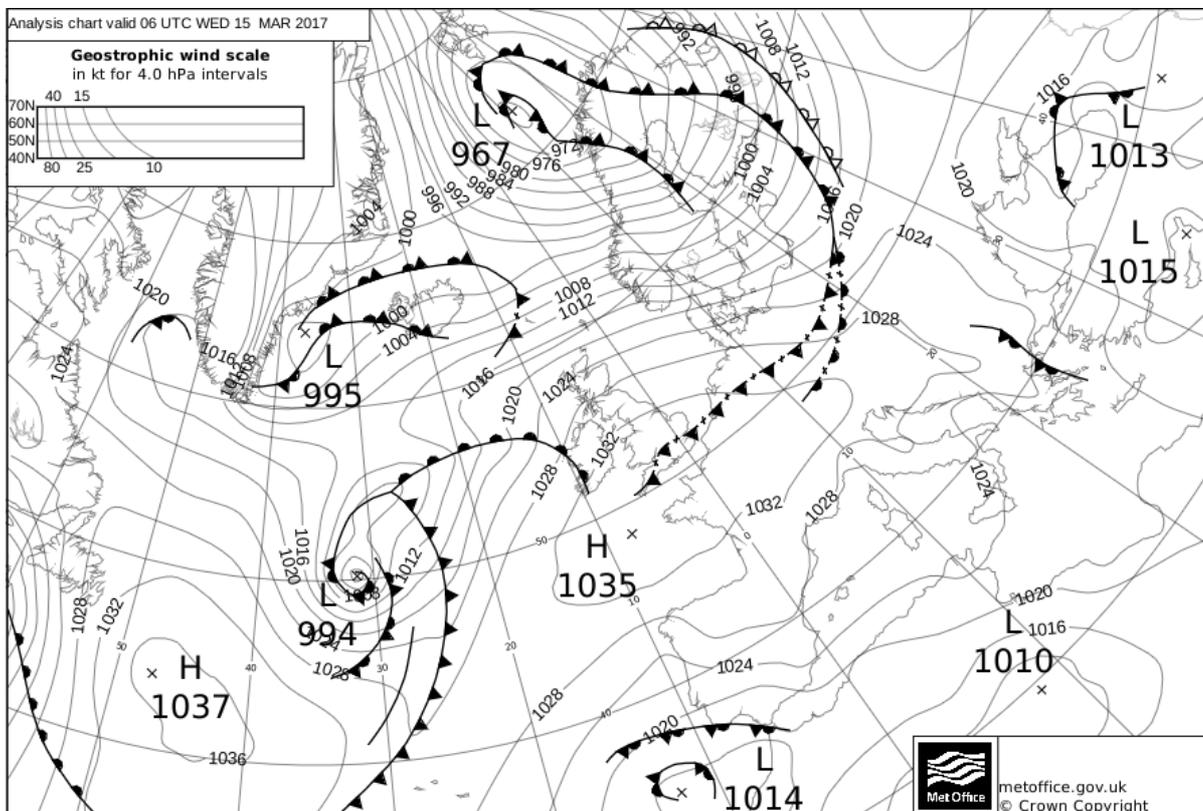
Date: 15<sup>th</sup> March 2017, departing 08 UTC

Let's take a look at the weather forecast, assess the potential threats and start investigating how to mitigate against these risks.

#### Weather Briefing:

##### a. Synoptic situation

Describe the broad features in the synoptic chart, what is the main type of airmass covering the region and what kind of weather can we expect from it? How strong is the wind likely to be and what will its direction be?



An anticyclone (1035hPa) extends a ridge over the south of the UK, suggesting settled conditions. A decaying cold front is slow-moving across southern England (the crosses on the front indicate that it is weakening). Despite becoming less active this front retains some of its characteristics. It is likely that significant amounts of cloud will be trapped under the ridge and this could be thick enough to generate rain and drizzle thus a risk of poor visibility in places.

The time of year is a key consideration for this forecast; it's almost the March equinox so the length of day and night are nearly equal. The nights can still be cold and under such high pressure, it would not take long for fog to form in places. Additionally, away from the front and under any clear sky, the temperature can rise significantly and improve conditions during daytime.

So, what kind of hazards are usually associated with spring or autumn weather? See the cheat sheet below...



## Flying in spring & autumn

Check the latest METAR TAF



Radiation fog formed overnight under clear skies and light winds can persist after sunrise, particularly at the bottom of valleys and near water sources (lake, river, marsh...).

The freezing level can be surprisingly low and lead to in-flight icing in any cloud. Cumuliform cloud will have more liquid water content than stratiform cloud.

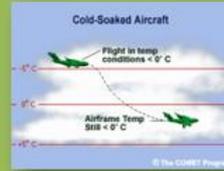


Limit your exposure time, lower your altitude

Check surface pressure charts, look for an Anticyclone



Cold soaking can lead to frost forming on airframes during cold nights, particularly after a period of rain or if there is high humidity in the air.



Cold soaking can also occur when an aircraft descends from a cold to a warm environment, but the fuselage has not had the time to adjust to the ambient temperature.

Low pressure systems always bring showers and strong winds to our shores. At this time of the year however, the daylight heating is such that it often results in warmer temperatures and heavier showers over land.

Check the weather radar and time of the day

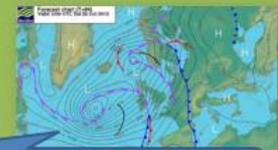


Severe downdraughts and poor visibility likely



It is not unusual to see cumulonimbus clouds and thunderstorms developing, sometimes accompanied by hail or even snow showers.

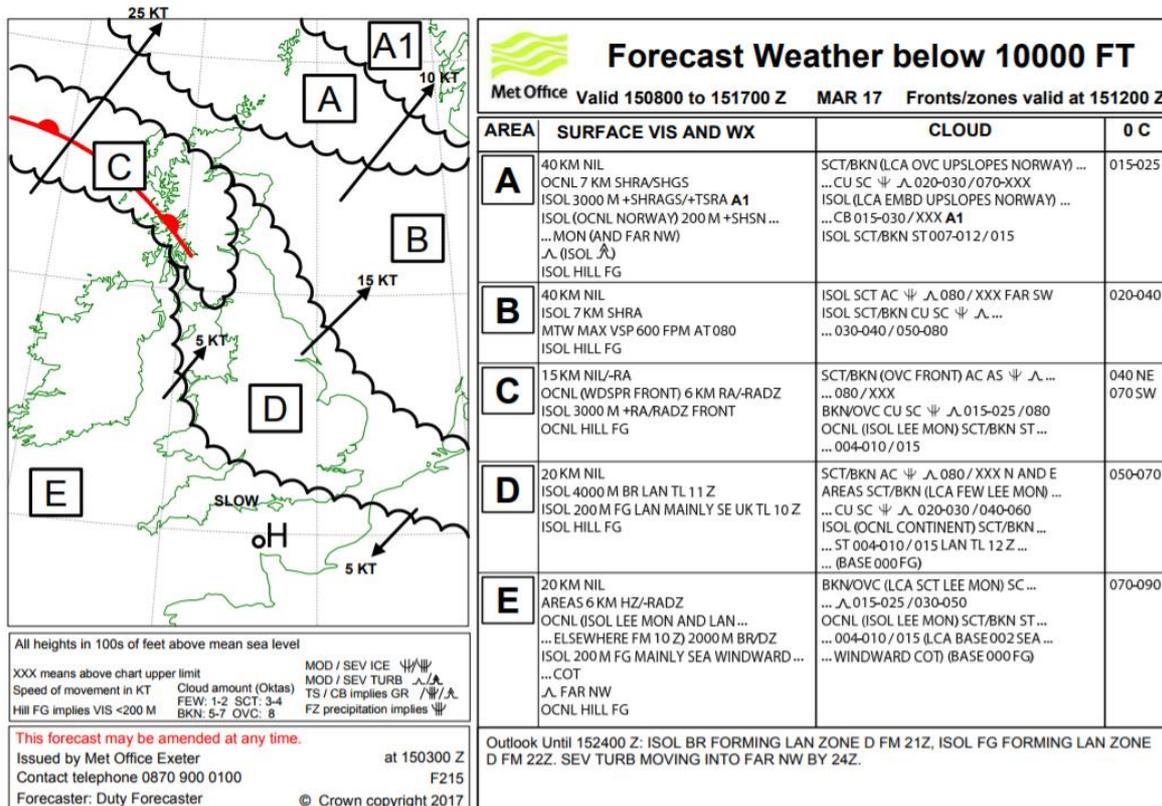
Spring and autumn can often bring unsettled weather or even stormy conditions, with strong gales, low cloud and heavy rain.



Increased risk to safety – be weather aware

### b. Area Forecast

Looking at the F215 chart, is there anything along the route that I should be taking into consideration? What are the main cloud base and visibility? What is the altitude of the freezing level? Can I expect any fronts, weather, turbulence or icing?



Focusing on the route from East Midlands to Cambridge and area D specifically, there seems to be a lot of cloud, all at various levels and accompanied by turbulence. Some moderate icing is expected but the lowest freezing level is expected to be 5000ft. The main cloud base is expected to be quite low at around 2000-3000ft but there will also be significant amounts (BKN) of stratus in some areas at very low level (400-1000ft), which will persist until midday, so navigation may be challenging. The visibility does not seem to be badly affected by the anticyclone; there will be patches of fog but these are expected to be isolated and mainly to the south-east of the UK. Although the medium level cloud (above 8000ft) may not affect you directly, it will slow the process of heating the surface to clear mist and fog patches.

### c. Site specific information

Let's have a look at the METARs/TAFs along the route, do they confirm the information contained in the F215? Have you checked your destination airfield as well as the diversion(s) airfield(s), are they suitable?

- METAR EGNX 150650Z 22005KT CAVOK 06/05 Q1033=
- METAR EGBB 150650Z VRB03KT 9999 MIFG VCFG NSC 05/05 Q1033=
- METAR EGXT 150650Z AUTO 27008KT 4600 BR SCT150/// 06/05 Q1032=
- METAR EGGW 150650Z AUTO 30003KT 0150 R26/0275 FG VV/// 06/06 Q1033=
- METAR EGSC 150650Z NIL=
- METAR EGSS 150650Z 32003KT 2500 R22/0400 BCFG NSC 05/05 Q1033=
- METAR EGYM 150650Z 23004KT CAVOK 08/07 Q1033 BLU NOSIG=

TAF EGNX 150503Z 1506/1606 24006KT 9999 SCT030  
PROB30 TEMPO 1506/1509 8000  
BECMG 1602/1605 BKN007  
TEMPO 1602/1606 2000 BR BKN002=

TAF EGGW 150500Z 1506/1606 28007KT 3000 BR FEW020  
TEMPO 1506/1509 0300 FG BKN001 BECMG 1509/1512 9999 NSW  
PROB30 TEMPO 1509/1512 BKN008 TEMPO 1520/1606 3000 BR  
PROB30 TEMPO 1523/1606 0800 FG BKN001 BECMG 1603/1606 22010KT=

TAF EGYM 150740Z 1509/1518 24008KT 9999 SCT025=

A few airfields are reporting visibility problems as previously discussed with the synoptic chart analysis, but these are not expected to last past 1100UTC. Cambridge airfield has not yet opened but, looking in the vicinity, both Luton and Stanstead are reporting fog or fog patches. Marham is CAVOK (Ceiling And Visibility OK) with a NOSIG (No Significant changes) trend. Of note, Luton (EGGW) is expecting temporary spells of broken cloud at 800ft until midday. This all agrees with the F215 chart regarding the forecast cloud and the fog patches being mainly in the south-east of the UK.

#### **d. Threat & Error Management**

ANTICIPATION: Consider your limits and how the forecast cloud and visibility may present a threat:

- a. Is your departure and arrival time realistic given the forecast conditions at East Midlands and Cambridge and the possibility of low cloud along the route?
- b. Can you fly your planned route in appropriate airspace when constrained by the terrain and forecast cloud and visibility? Remember those low cloud patches!
- c. What is your safety altitude for the flight? Can you achieve this and remain VMC, below the freezing level given the forecast?

RECOGNITION: A safe flight depends on conditions improving as forecast and cloud.

- a. What is your plan to get up to date METARS or other weather information? Online? Phone ahead before departure? Web cams?
- b. Can you check destination conditions en-route? How does this fit in with your wider communications plan?
- c. Where and when are your decision points on the route if conditions become unsuitable to continue?

RECOVERY: At each decision point you MUST have planned actions for the eventuality that the weather does not improve or is unsuitable on your route. Given the forecast, it is likely that the best weather will always be behind you and away from the SE.

- a. Can you delay departure until you are certain that conditions are suitable along your entire route?
- b. Do you have diversion information for appropriate airfields away from the greatest fog/mist and low cloud risk?
- c. Have you planned alternative routes to these diversions from each decision point?

### e. Summary

The main concern in this spring high pressure situation is how quickly the early mist/fog will clear and the variability of low cloud from the weakening cold front. Having analysed the situation, it seems the worst of the conditions are located to the south-east of the UK and may persist until midday. Cloud base is set to be around 2000-3000ft with visibility greater than 10km (after 09Z). However, the anticyclone is likely to trap low level moisture and there is a risk of low level cloud until midday. Do you really have to go at 0800UTC? Consider the duration of your flight, weather improvement times and the length of remaining daylight and good conditions.

The flight should only be started once you are confident that en-route conditions are safe, and you should make regular checks on conditions at the destination before continuing past planned decision points. You must *always* have an alternate plan for unsuitable conditions **and put it into action at the first sign of deterioration.**