

Regulatory service provision



Met Office



Met Office User Forum 11
Regulatory service provision

Nigel Gait, Regulated Aviation Services Manager
23rd October 2014
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a. Actions resulting from MOUF/10

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Actions resulting from MOUF/10

Reference:	MOUF/10/2013/01
Action:	MOUF ToRs and attendance: -Review proposed MOUF ToRs -Ensure the correct delegates for each organization continue to be identified -Review currency of MOUF representatives and future meeting arrangements
Action on:	DH
Status:	OPEN
Reference:	MOUF/10/2013/02
Action:	AIRMETS: In consideration of the comments expressed at MOUF/10, MOUF members are invited to review the continuation of current UK AIRMET provision. DH to correspond with users on this.
Action on:	DH
Status:	OPEN
Reference:	MOUF/10/2013/03
Action:	Met Divisional Meeting: Provide a summary paper to the group ahead of the meeting describing the UKs input into the Met Divisional and invited any feedback from the group.
Action on:	AW
Status:	OPEN

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Actions resulting from MOUF/10

Reference:	MOUF/10/2013/04
Action:	Non standard anemometer heights: <ul style="list-style-type: none"> Review the anemometer siting at those airports that provide readings outside the 9-11 metres range required by ICAO, Confirm that an adjustment provided as a result of anemometers at non standard heights is calculated at source thereby ensuring the results are reflected in both METARs and local reports.
Action on:	DH
Status:	OPEN
Reference:	MOUF/10/2013/05
Action:	Aerodrome warnings: Provide the MOUF with a copy of the comment response document following the consultation feedback
Action on:	AW
Status:	OPEN
Reference:	MOUF/10/2013/06
Action:	Met Office space weather programme: Provide the group with an update on the activities of the Met Office's space weather programme by March 2014.
Action on:	AW
Status:	OPEN


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b. Review of Met Costs

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Overview of Met Costs

- Standard direct and core services continue unchanged, WAFC, VAAC, UK Low Level Aviation Met service, Aviation R&D, technical support to CAA.
- Assumptions from 2015 include:
 - Continuation of Civil Contingency Aircraft to Jan 2018
 - UK LIDAR Volcanic Ash Detection network (operational from 2016 - £3m DfT capital grant)
 - Continued development of volcanic ash dispersion modelling and processing of data from new satellites
- Efficiencies from 2015:
 - £1.3m reduction in contribution to core
 - 2.5% annual efficiency on core and direct services

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Met Determined costs and Unit rate for RP1

	2010	2011	2012	2013	2014
Determined costs in NPP	27453	29386	29073	28500	28300
Adjustment from Yr-2			3500	(300)	
Inflation adjustment					877
Traffic adjustment	110	(400)			2262
Chargeable costs	27563	28986	32573	28200	31439
Total Service Units	9567	9971	10325	10667	11035
Unit rate	2.69	2.91	3.15	2.64	2.85



Met Determined costs and Unit rate for RP2

	2014	2015	2016	2017	2018	2019	CAGR
Determined costs (£k nominal)	28300	28061	27852	27673	27492	27341	
Inflation adjustment	877	1090					
Traffic adjustment	2262	2412					
Chargeable costs	31439	31562	27852	27673	27492	27341	
Total Service Units	11034	10244	10435	10583	10758	10940	
Unit rate	2.85	3.08	2.67	2.61	2.56	2.50	

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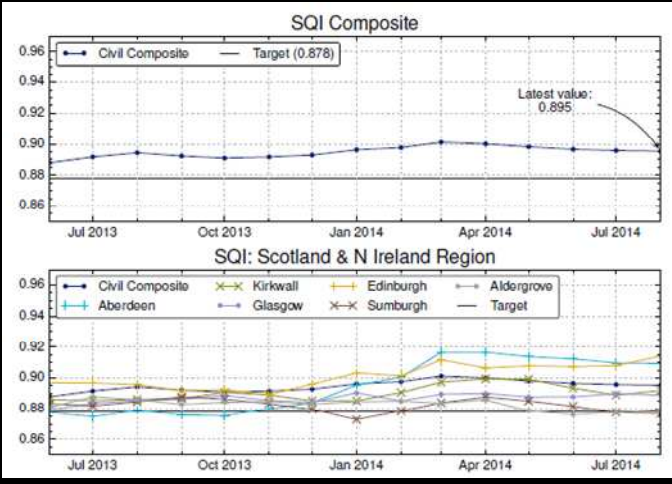
c. 2014 Service performance

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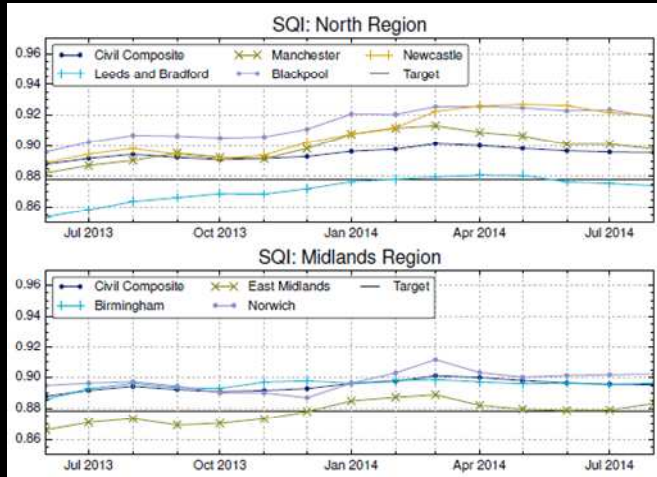
2014 Service performance
- TAFs (1)



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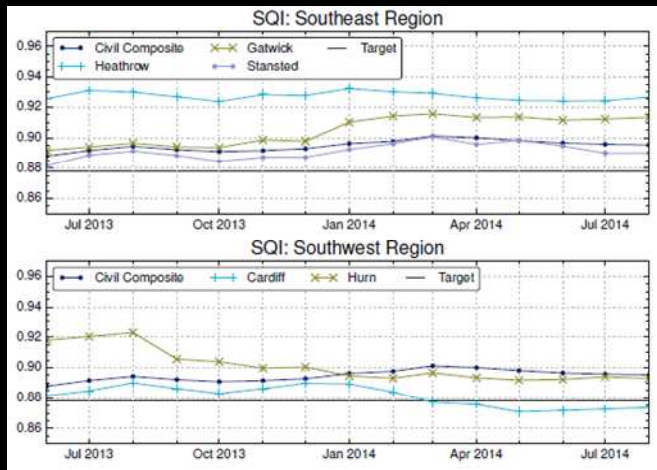
2014 Service performance - TAFs (2)



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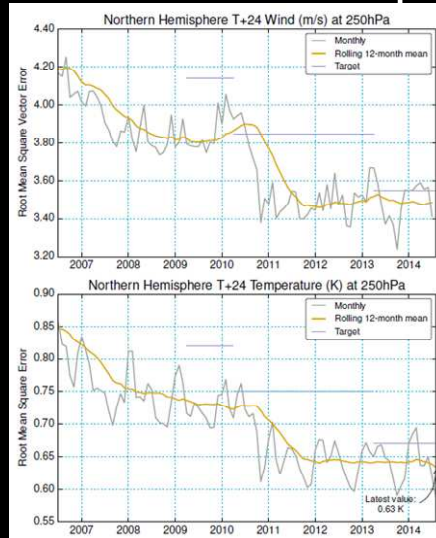
2014 Service performance - TAFs (3)



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2014 Service performance - WAFC wind & temps



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d. 2015-16 R&D outline proposals

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MET Aviation R&D Themes

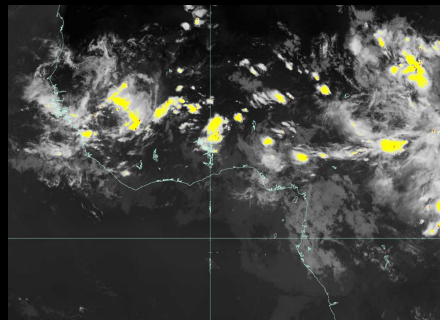
- Theme 1: Towards a better understanding of global en-route hazards
- Theme 2: New observations and improved forecasting of winds and convection for UK services
- Theme 3: Improved understanding of weather hazards and improved forecasting at UK airports

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Theme 1: Towards a better understanding of global en-route hazards

- Developing a near-global satellite imagery product for detecting regions of potential severe convection
- Assessment of IAGOS aircraft observations in high ice water content regions

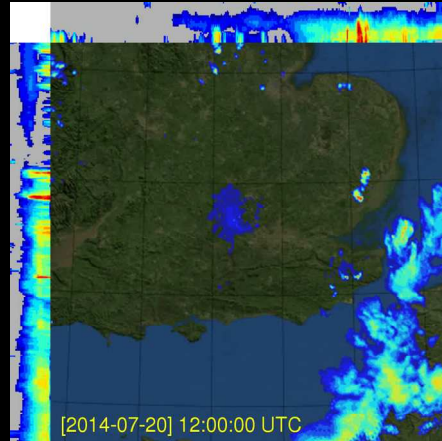


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Theme 2: New observations and improved forecasting of winds and convection for UK services

- An investigation into the error characteristics of ADS-B data
- Detection and monitoring of developing convective clouds using satellite imagery
- Visualisation of 3D radar reflectivity in the LTMA for operational meteorologists and antenna position error analysis
- Nowcasts of 3D Convection for aviation



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Theme 3: Improved understanding of weather hazards and improved forecasting at UK airports

- Improving the use of observations in fog nowcasting
- Detailed comparison of high resolution ensemble model forecasts with field observations of fog formation & evolution
- Spatial and temporal performance of fog forecasts from UK models
- Exploring climate adaptation needs: Assessing airports' sensitivities to risks posed by climate change



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e. Volcanic Ash Update

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ICAO – IAVWOPSG Feb 2014

- Conclusion 8/3 – guidance on agreed in-situ and/or remote sensing techniques for discernible ash**
- Conclusion 8/11 - Extension of VAAC London area of responsibility**
- Conclusion 8/12 – coverage of the unmonitored area north of the area of responsibility of VAAC Tokyo**
- Conclusion 8/13 – Extension of VAAC Toulouse area of responsibility**
- Conclusion 8/18 – Trial product for volcanic ash information at T+24 hours**
- Conclusion 8/19 – Trial of allocation of forecast confidence in VA advisories**
- Conclusion 8/23 – Development of a manual on space weather for International Air Navigation**

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Volcanic ash – European progress

- Exercises conducted in Italy/SE Europe and Kamchatka in 2014
- Next exercise – Autumn 2015 (Iceland, tentative)
- Changes to NAT / EUR VA Contingency plans
- Volcanic ash Contamination Charts proposed to migrate from ash concentration to total ash-column based approach
- Content and dissemination of special air reports on volcanic ash

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Met Divisional Meeting – July 2014

- Development of WAFS in support of ASBU
- Development of SADIS and WIFS within SWIM
- Withdrawal of SADIS 2G and testing of AMHS
- Development of IAVW and space weather
- Develop regional advisory system (SIGMET deficiency)
- Space weather provisions and radioactive cloud
- Met service for terminal areas/ATM

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f. SESAR progress report


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SESAR WP11.02

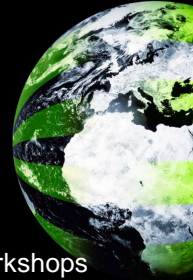


- P11.02.01 tasked with:
 - Gathering MET Requirements within the SESAR programme.
 - Raising awareness of high-capability MET.
- P11.02.02 tasked with:
 - Developing MET capabilities and prototypes, *e.g. nowcasting of convection, diagnostics for CAT/icing, network capacity reduction owing to weather, support to 4D trajectory prediction, plus 4DWxCube/MISC concept, design and architecture*
 - Verification and validation of prototypes.

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SESAR WP11.02



- Work this year:
 - Raising awareness through a series of workshops aimed at priority OFAs/projects, *e.g. Airports, Network, Airspace Users, Ground-based Separation Provision.*
 - Engaging with these to identify and develop validation opportunities.
 - Updating documentation, *e.g. Technical Architecture Description, Technical Specifications, Interface Requirements, Validation and Verification Plans.*
 - Reviewing documentation from other projects with MET requirements.

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SESAR WP11.02



- Confirmed Validation Exercises:
 - VP-513: De-icing Management
 - VP-700: Advanced Short Term ATFCM
 - VP-461: Digitally Enhanced Briefing Services
 - VP-757: Complete AOM Concept, 'Big Bang'
 - VP-669: Close out Airport Integration through SWIM
 - VP-791: Use of Global Ensemble Wind Forecasts in Flight Planning
- Unconfirmed:
 - VP-797: Conflict Detection and ATC Interoperability in a Free-Routing Environment
 - VP-798: Free-Routing and Direct-Routing Environment

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SESAR WP11.02



- Looking ahead:
 - Working with other projects/OFAs to further develop requirements.
 - Support to Validation Exercises.
 - Verification Plans.
 - Final updates to documentation.
 - Future planning for SESAR2020 and Deployment phase.

National services



Met Office



Met Office User Forum 11
Agenda Item 3: National services

Darren Hardy, Snr National Aviation Met Advisor
23rd October 2014
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a. Changes to UK regulated service provision

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a. Changes to UK regulated service provision

- Performance Indicators

<http://www.metoffice.gov.uk/aviation/national-responsibilities/caa-verification> .

- Changes to TAF provision
- Competency of meteorologists
- CAA audit of Met Office
- EASA Standardisation audit
- Changes to offshore provisions

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b. Aerodrome weather warnings

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Contents

This presentation covers the following areas

- Requirements for aerodrome warnings
- Rationale for change
- Summary of current warnings service
- Features of new service
- Next steps

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Requirements for aerodrome warnings

- An ICAO 'Standard'

Aerodrome warnings shall be issued by the aerodrome meteorological office designated by the meteorological authority concerned and shall give concise information of meteorological conditions which could adversely affect aircraft on the ground, including parked aircraft, and the aerodrome facilities and services.

- Service required under Designation Agreement

Aerodrome warnings shall be issued by the Met Office giving concise information of the meteorological conditions which could adversely affect aircraft on the ground, including parked aircraft, and aerodrome facilities and services.

Aerodrome warnings shall be issued to the aerodromes detailed in the table below for the following phenomena; strong winds or gale, squalls, hail or thunderstorms, snow, frost, fog and freezing precipitation.

Warnings are required to provide a basic alerting service to aerodromes

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Rationale for change

- Aerodrome specific services are not recoverable from **en-route charge** under EU charging regulations & ICAO cost recovery principles
- Instead they form part of the **Terminal Charge**
- CAA served notice to apply this for aerodrome warnings from **1 July 2013**
- But, the cost of managing the service at an individual airport level is inefficient.
- So, a pragmatic solution was agreed allowing the service cost to be continued to be recovered from the en-route charge (a more cost effective way)
- This was dependent on:
 - i. the new service benefiting from being part of a 'holistic' aerodrome advice service
 - ii. Web based (for accessibility)
 - iii. More cost effective in delivering the minimum ICAO requirements
- CAA issued a requirements document in 2013

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Summary of current warnings service

- Warnings for 107 UK aerodromes
- Alphanumeric message
- Fully monitored during aerodrome operating hours
- Warnings for the following weather:
 - Strong Wind
 - Gale
 - Frost (Ground Frost, Air Frost, Ground and Air Frost)
 - Snow
 - Fog (Fog, Freezing Fog)
 - Thunderstorm (Thunderstorm, Thunderstorm & Hail, Thunderstorm & Squall, Squall, Thunderstorm & Hail & Squall)
 - Hail
 - Freezing Precipitation
 - Temperature Inversion
- Sent via AFTN, email or fax & displayed on customer facing web services

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Summary of current warnings service

Strong Wind Warning



Tel: 0870 900 0100 <http://www.metoffice.gov.uk>

EDINBURGH TURNHOUSE AIRPORT

Issued at: 22:34, Saturday 21 Dec 2013
Warning Number: 21/003
Valid: 220000 to 220400 UTC
Text: THE SW WIND WILL MEAN 18KT AT TIMES WITH GUSTS OF 28KT.

Issued by the Met Office, Aberdeen.
 Crown Copyright, Met Office, 2013.

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Features of new service

- No change to warning types
- No change to aerodromes covered
- Web based (graphical & tabular versions)
- Web will allow users to pan and zoom
- 24/7 coverage
- Warnings will be issued routinely every 6 hours, 4 times per day

Time of update	Period of validity
0515	1200-1800
1115	1800-0000
1715	0000-0600
2315	0600-1200

* Except Thunderstorms which will have at least 1 hour lead time

- Not amendable

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Features of new service

- Integrated with NSWWS warnings for 'holistic' approach to alerting
- Simple self registration process where users can:
 - register for email alerts when warnings are issued for their aerodrome
 - change email address
 - establish a user password
- Airports can register for warnings for 5 airports. GA subscribers - 2 airports
- The email alerts will include the warning detail
- Warnings will also be routinely routed to NATS CACC
- Location of service on refreshed Met Office web site
- Verification of warnings & monitoring of dissemination process
- Service expected to go live in Q1 FY15-16

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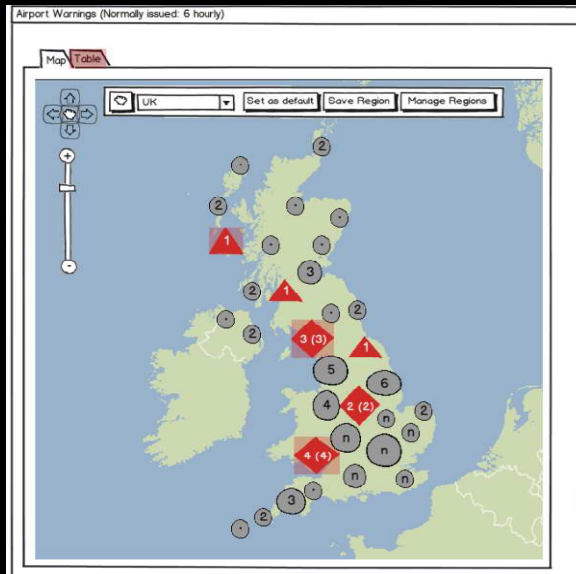
Features of new service

- Enhanced option available (essentially replicating the current service):
 - Fully monitored
 - Amendable
- Exempt from cost recovery so there would be a charge

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Indicative mock-ups

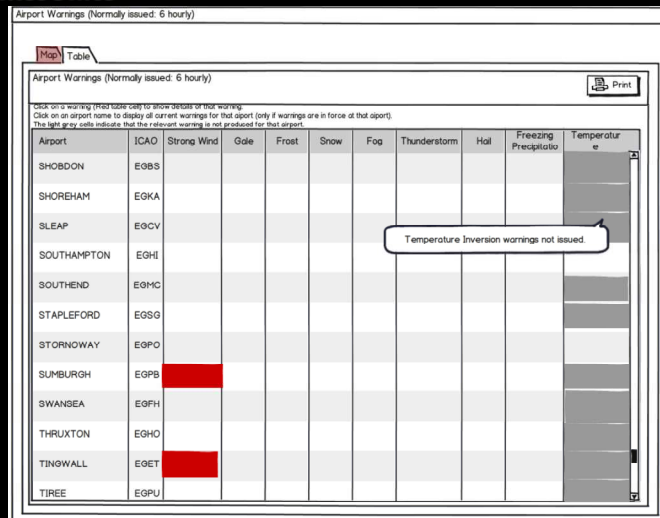


Warnings 'home page' – main view

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Indicative mock-ups




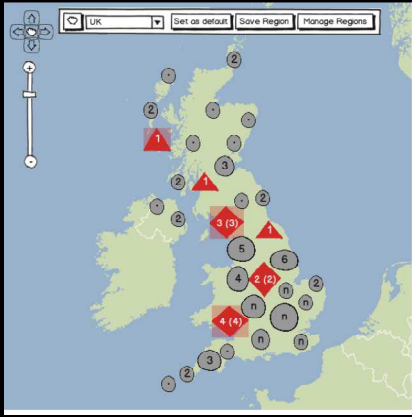
Airport	ICAO	Strong Wind	Gale	Frost	Snow	Fog	Thunderstorm	Hal	Freezing Precipitation	Temperature
SHOBDON	EGBS									
SHOREHAM	EGKA									
SLEAP	EGCV									
SOUTHAMPTON	EGHI									
SOUTHEND	EGMC									
STAPLEFORD	EGSG									
STORNOWAY	EGPO									
SUMBURGH	EGPB									
SWANSEA	EGFH									
THRUXTON	EGHO									
TINSHALL	EGET									
TIREE	EGPU									

Warnings 'home page' – tabular view

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Indicative mock-ups





Where airports are close together at the current zoom level on the map, they will be grouped.

Zoom in to see more detail.

NOTE

Locations marked in this mock-up are not necessarily geographically accurate.


Symbols to be decided - these icons used for illustration

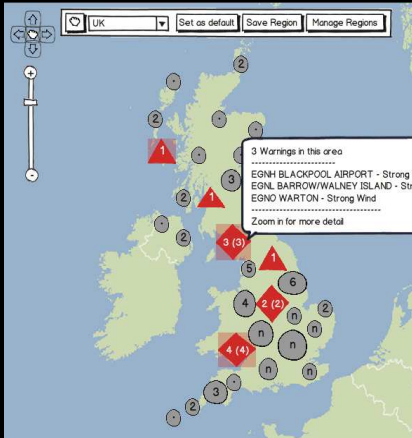
- ▲ (n) Position of single aerodrome with n active warnings. Click to be taken to the warning[s] detail[s] for this aerodrome. Hover over to see warning[s] detail[s] in a pop up.
- ◆ (n) Position of a cluster of n aerodromes with 4 active warnings. Zoom in for more detail.
- Position of aerodrome with no active warning.
- (n) Position of a cluster of n aerodromes with no active warning. Zoom in to see position of aerodromes separately.

De-cluttering of warnings when panning out to cover the whole of the UK

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Indicative mock-ups





Hovering over a grouped set of warnings summarises the warnings.

Zoom in for more detail.

3 Warnings in this area

.....

EGNH BLACKPOOL AIRPORT - Strong Wind

EGNL BARROW/WALNEY ISLAND - Strong Wind

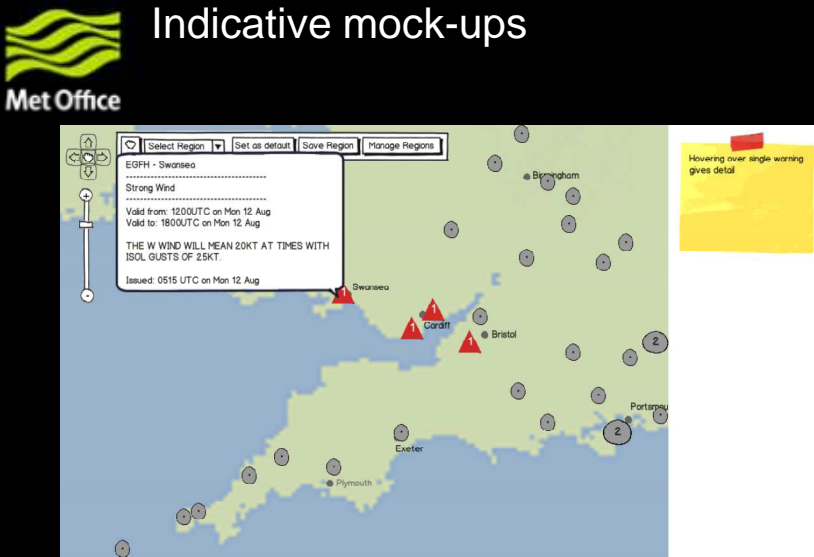
EGNO WARTON - Strong Wind

.....

Zoom in for more detail

Warning summary visible from hovering over an airport

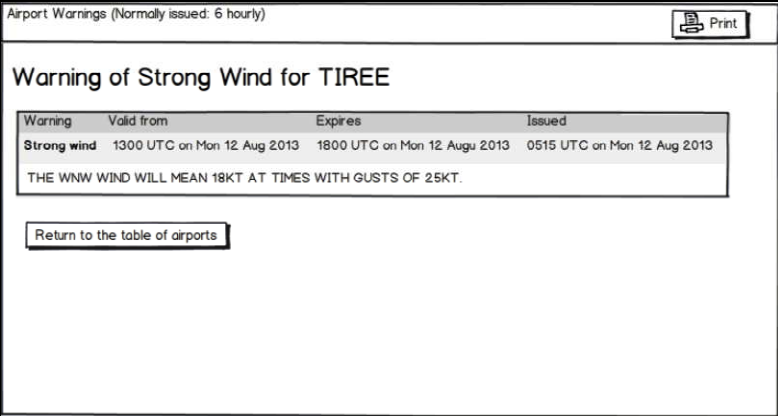
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Indicative mock-ups

Warning summary visible from hovering over an airport (zoomed view)

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Indicative mock-ups

Airport Warnings (Normally issued: 6 hourly) Print

Warning of Strong Wind for TIREE

Warning	Valid from	Expires	Issued
Strong wind	1300 UTC on Mon 12 Aug 2013	1800 UTC on Mon 12 Aug 2013	0515 UTC on Mon 12 Aug 2013

THE WNW WIND WILL MEAN 18KT AT TIMES WITH GUSTS OF 25KT.

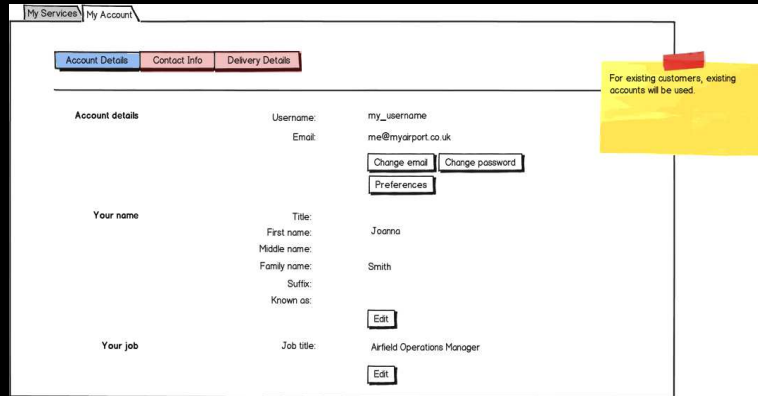
[Return to the table of airports](#)

Example of warning displayed

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Indicative mock-ups



My Services | My Account

Account Details | Contact Info | Delivery Details

For existing customers, existing accounts will be used.

Account details

Username: my_username
 Email: me@myairport.co.uk
 Change email | Change password
 Preferences

Your name

Title:
 First name: Joanna
 Middle name:
 Family name: Smith
 Suffix:
 Known as:
 Edit

Your job

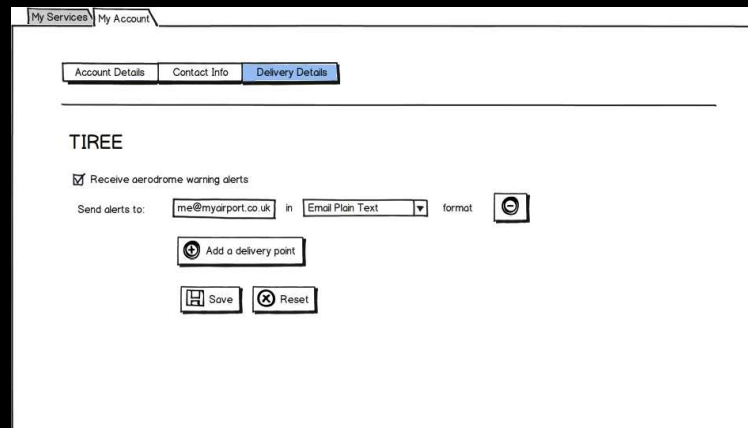
Job title: Airfield Operations Manager
 Edit

Simple registration page

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Indicative mock-ups



My Services | My Account

Account Details | Contact Info | Delivery Details

TIREE

Receive aerodrome warning alerts

Send alerts to: me@myairport.co.uk in Email Plain Text format

Add a delivery point

Save | Reset

Users will have the option of receiving email alerts of warnings issued affecting your nominated airport

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Next steps

- CAA consultation process completed (available from CAA)
- Developing solution
- Engaging closely with Met Office briefing portal project
- Airports and pilots will need to register online to access the new service - look out for guidance on registering nearer the time

Services to GA



Background

- Met Office is designated by CAA as sole provider for regulated low level aviation services in UK.
- Existing GA offering has not been refreshed for years.
- Market has changed in terms of how and where pilots access information.



What are we doing?

- Completely re-designing/re-developing the GA web site.
- Creating content that can be viewed on desktop, tablet or mobile devices.
- Should work on a wide variety of small screen devices – hardware agnostic solution.
- Will look and feel similar on all devices, but some differences. E.g. No map viewer on mobile phones.

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What will be available?

- Free version - Everything available on the current (free) GA web site.
 - TAF
 - METAR
 - Ballooning Forecast
 - F214/F215
 - Airmets
 - Map Viewer with Layers – visibility, cloud, wind
 - Map viewer – colour states and aerodrome warnings
 - Aerodrome Warnings (New)
 - 3 day planner
 - QNH (New)
- A new premium version, with additional features and content.

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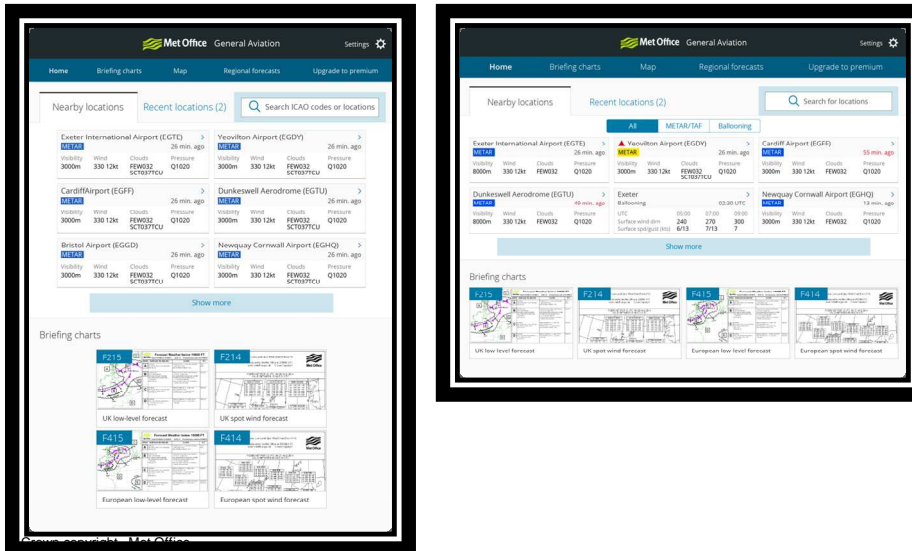
What will it look like? - Mobile



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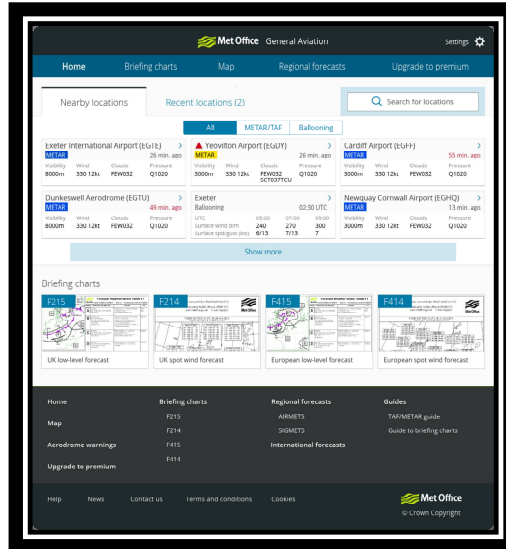
What will it look like? - Tablet



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What will it look like? - Desktop



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Timescale

- Early 2014 CAA Approval
- User Needs Analysis and Testing – June 2014
- Project Definition Phase June – August 2014 – (Complete)
- Development Phase September 2014-February 2015
- Planned User Rollout April 2015

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How do I get it?

- Look out for promotional material, which will get emailed to existing registered users.
- You will need to register online to access the new service –from April 2015.

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How can I help?

- If you would like to be involved in early user testing of the application please leave your name and contact details with Darren.

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MOUF/10/2013/01 – Terms of Reference of the MOUF

1. Purpose of the Group

The Met Office User Forum will act as the principal consultation forum on aeronautical meteorological products and services provided by the Met Office with airspace users and the CAA, to meet ICAO Annex 3 Standards and Recommended Practices. The Met Office User Forum should:

- a) Provide advice and guidance to the Met Office and the Met Authority, CAA, concerning the provision of meteorological services and its effectiveness in meeting the current service specification that defines the needs of international and domestic air navigation.
- b) Examine aeronautical meteorological costs, and the methods of cost recovery, with a view to ensuring efficiency, effectiveness and value for money in relation to the quality of service required.
- c) Develop proposals for the improvement of meteorological services in order to ensure that they continue to meet evolving operational requirements.
- d) Consider reports from the R&D Steering Group (a sub-group of the Forum) and review the efficacy of R&D work.
- e) Advise the Met Office and the Met Authority, CAA, in the development and use of appropriate output performance indicators.
- f) To consider any deficiencies in current ICAO Annex 3 requirements and the need for commercial/bi-lateral arrangements for Met service provision
- g) Enable a wider discussion of aeronautical meteorological issues as appropriate.

2. Composition of the Group

The User Forum will comprise:

- a. Chair, Head of Aviation Business, Met Office or nominated designate.
- b. A secretary who will be provided by the Met Office.
- c. Representatives from:
 - Airport Operators Association
 - Aircraft Operators and Pilots Association
 - British Airline Pilots Association

- British Air Transport Association
 - European Low Fare Airlines Association
 - Guild of Air Pilots and Navigators
 - International Air Transport Association
 - UK Flight Safety Committee
- d. Other representatives from:
- Airline Operators
 - Aerodrome Licence Holders or Aerodrome Certificate Holders
 - Air Traffic Service Providers
- e. The Chairman may co-opt Met Office and CAA staff with specialist skills to the Working Group as required.

3. Frequency of Meetings

The Group will plan to meet once per year. Ad hoc meetings may be called by the Chairman, or at the request of a member through the Chairman, should a topic of sufficient importance arise between meetings.

4. Correspondence

Notes will be produced for each meeting, together with an Action List to track the progress of matters arising. Correspondence will normally be conducted by e-mail.

5. Responsibilities

	Title	Name
Owner	Regulated Aviation Service Manager	Nigel Gait
Maintainer	Snr National Aviation Met Advisor	Darren Hardy

6. Document Issue History

Version	Issue Date	Change Description
V2	19/12/13	Review and amendment

7. Current membership of the Met Office Users' Forum

Name	Representing	E-mail address
Ian Cameron Nigel Gait Darren Hardy	Met Office	ian.cameron@metoffice.gov.uk nigel.gait@metoffice.gov.uk darren.hardy@metoffice.gov.uk
Andy Wells Colin Hord	CAA	andy.wells@caa.co.uk colin.hord@caa.co.uk
Peter Cox	The Honourable Company of Air Pilots	peter.cox1@virgin.net
Andy Foyston Phil Layton James Carr Stuart Dingle	NATS	andy.foyston@nats.co.uk phil.layton@nats.co.uk james.carr@nats.co.uk stuart.dingle@nats.co.uk
John McCaskill Gareth Nicholas Les Dunn	HIAL	jmaccaskill@hial.co.uk gnicholas@hial.co.uk campadmin@hial.co.uk
John Hamshare	LHR Airport Ltd	john_hamshare@heathrow.com
John Hanlon	European Low Fare Airlines Association	john.hanlon@elfaa.com
Marie Pennington	Southampton Airport	marie_Pennington@Southamptonairport.com
Dominic Haysom	Easyjet	dominic.haysom@easyjet.com
Steve Stebbings	British Airways	Steve.stebbing@ba.com
John Haney	Airport Operators Association (AOA)	JohnHaney@aoa.org.uk
Steve Copeland	Aircraft Operators and Pilots Association (AOPA)	steve@copeland.net
Simon Buck	British Air Transport Association (BATA)	buck@bata.uk.com
Nick Rhodes Paul Clarke	Flybe/ European Low Fare Airlines Association (ELFAA)	nick.rhodes@flybe.com paul.clarke@flybe.com
Steve Smith	Thomson	stephen.smith2@thomson.co.uk
Steve White Tim Kinvig	Loganair	stevewhite@loganair.co.uk timkinvig@loganair.co.uk
Rob Hunter Steve Landells	British Airline Pilots Association (BALPA)	RobHunter@balpa.org stevelandells@balpa.org
tbc	International Air Transport Association (IATA)	tbc
Dai Whittingham	UK Flight Safety Committee (UKFSC)	chief.executive@ukfsc.co.uk

MOUF/10/2013/04 - Non standard anemometer heights

1. Introduction

At the 2013 MOUF the following action was raised:

Reference:	MOUF/10/2013/04
Action:	<p>Non standard anemometer heights:</p> <ul style="list-style-type: none"> • Review the anemometer siting at those airports that provide readings outside the 9-11 metres range required by ICAO, • Confirm that an adjustment provided as a result of anemometers at non standard heights is calculated at source thereby ensuring the results are reflected in both METARs and local reports.
Action on:	DH
Status:	OPEN

This paper:

- Provides brief commentary on each UK airport with anemometry sited outside the 9-11 metre range required by ICAO, and
- Defines the regulatory requirements pertaining to the provision of wind data in meteorological reports
- Discusses the practical impacts of these regulations

2. Current status of UK airport anemometry

Of the 54 UK airports that provide compliant meteorological reports (in the form of METARs and local routine & special reports), 28 airports have all anemometry sited at 10 metres +/- 1 metre above ground level. Of the remaining 26 airports, 17 have all anemometry sited between 8 to 13 metres above ground level and 9 have one or more anemometers sited outside this range. All airports¹ apply an approved instrument correction at source to provide results that are representative of 10 metres, which takes account of flow distortion caused by topography.

Previous CAA sponsored studies have shown that data provided from anemometers sited between 8-13 metres above ground level provide results that are representative of 10 metres, without the need to apply a correction algorithm.

¹ Hawarden's 04 runway anemometry is located at 15m. Further investigations are underway to determine the process by which a correction is applied to the speed readings

A summary of the anemometry currently provided at each UK airport that provides METAR is available at **Annex A**.

3. Current regulatory requirements

a. ICAO Annex 3 'Meteorological Service for International Air Navigation', Ed. 2013 (Amd 76)

4.1.1.1 **Recommendation.**— *Surface wind should be observed at a height of 10 ± 1 m (30 ± 3 ft) above the ground.*

b. EASA

The EASA rule-making group is presently drafting its technical requirements for Met and the current proposed wording in respect of the Implementing Rules (IR) for the height of the anemometer states that:

"The meteorological instrumentation used to measure surface wind direction and speed shall be situated in such a way as to supply data which are representative of the area for which the measurements are required."

The Acceptable Means of Compliance (AMC) states that:

"Reported surface wind should be representative of a wind at a height of 10m +/- 1 m above the ground."

c. CAP 746 'Requirements for Meteorological Observations at Aerodromes, October 2012

Chapter 7 para 3.2 currently states:

3.2.1 For METAR reports, sensors shall be positioned to represent the wind flow at 10 metres above the surface. Measurements from sensors positioned between 8 and 13 metres high need no corrections; measurements from sensors positioned between 5 and 7 metres or 14 and 22 metres high should be increased by 10% or decreased by 10% respectively. The minimum acceptable height for the primary wind sensor is 5 metres.

3.2.2 For reports to Air Traffic Services, sensors shall be positioned to represent the wind flow at between 6 and 10 metres above the surface. No corrections to the speed measurements are required from sensors positioned between 5 and 7 metres above the surface. The minimum acceptable height for the primary wind sensor is 5 metres.

4. Discussion

These regulations should be seen in the context of the evolution of ICAO Annex 3 in terms of the requirement for the height of the anemometer:

14th Ed. 2001 (Amd 72) – Chapter 4 para 4.5.2 Surface wind observations for local routine and special reports should be representative of conditions at a height of 6 to 10m above the runway. Surface wind observations for METAR and SPECI should be representative of conditions at a height of 6 to 10m above the whole runway when there is only one runway and the whole runway complex where there is more than one runway.

15th Ed. 2004 (Amd 73) – Appendix 3 para 4.1.1.1 Surface wind should be observed at a height of approximately 10m above the runway(s).

16th Ed. 2007 (Amd 74) – Appendix 3 para 4.1.1.1 Surface wind should be observed at a height of approximately 10m above the runway(s).

17th Ed. 2010 (Amd 75) - Appendix 3 para 4.1.1.1 Surface wind should be observed at a height of 10m +/- 1 m above the ground.

18th Ed. 2013 (Amd 76) - Appendix 3 para 4.1.1.1 Surface wind should be observed at a height of 10m +/- 1 m above the ground.

Furthermore, it is notable that the EASA transposition of this particular ICAO regulation refers to the provision of wind data that is '*representative*' of the runway, as opposed to ICAO which refers to wind that is '*observed*'. This would permit airports to site their anemometers in such a way as to provide data which is representing the runways whilst taking account of a wide range of external factors such as where they are sited on a ridge/dip or their siting is limited by other factors such as the transition zone or other obstacles. Often, siting anemometry at exactly 10 metres limits the potential locations to the extent that the data may not adequately represent the actual runway conditions and therefore contrary to the intent of the ICAO provisions.

The CAA is aware of the need to align itself more closely with EASA regulations, and is considering an appropriate amendment to CAP 746. In the course of doing so, the CAA will take account of the costs versus the impacts of any changes to requirements; including any potential safety concerns that the current/future situation might give rise to. Re-siting anemometry is not an insignificant undertaking, particularly for smaller aerodromes and the need to move masts, cabling and possibly power on the aerodrome can be a major and costly piece of work.

The Met Office will continue to fulfil its obligations to the CAA through continuing its thorough approach to the UK airport Met audit programme.

Darren Hardy
29th November 2013

Annex A

Airport	ICAO	Height of	Comments
	Indicator	Anemometers	
Aberdeen	PD	10m x2	Standard
Barra	PR	8m	No correction required for its readings.
Belfast City	AC	10m x1	Standard
Belfast International	AA	6m x2	Located in the transition zone. Algorithm applied to compensate for non-standard height.
Benbecula	PL	9m x2	Standard
Biggin Hill	KB	10m x2	Standard
Birmingham	BB	5.5m x2	Located in the transition zone. Algorithm applied to compensate for non-standard height.
Blackpool	NH	10m x2	Standard
Bournemouth Int	HH	10m x3	Standard
Bristol	GD	8m x2	Located in the transition zone. Algorithm applied to compensate for non-standard height.
Cambridge	SC	10m x1	Standard
Campbeltown	EC	10m x1	Standard
Cardiff	FF	6m x2	Located in the transition zone. Algorithm applied to compensate for non-standard height.
Carlisle	NC	8m x1	No correction required for its readings.
City of Derry	AE	10m x1 8m x2	Currently, the R26 anemo at 8 metres is the METAR anemo. However, there are plans to make the central anemo at 10 m the designated one due to jetblast affecting the former
Coventry	BE	10m x3	Standard
Cranfield	TC	10m x1	Standard
Doncaster Sheffield	CN	10m x1 6m x1	The R02 anemometer (6m) is for local reports only, so no correction required to its readings.
Dundee	PN	10m x1 9m x1	Standard
Durham Tees Valley	NV	6m x1 14m x1	R05 anemometer is located within the transition zone R23 anemometer at 14m (METAR) has a data correction factor applied to convert to a standard 10 metre exposure.
East Midlands	NX	11m x2 8m x1	No corrections are applied to the readings of the central one.
Edinburgh	PH	6m x2	Located in the transition zone. Algorithm applied to compensate for non-standard height.
Exeter	TE	10m x3	Standard
Farnborough	LF	8m x2	No correction to its readings are required

Glasgow	PF	6m x2	Located in the transition zone. Algorithm applied to compensate for non-standard height.
Gloucestershire	BJ	10m x1	Standard
Hawarden	NR	10m x 1 15m x1	The R22 anemo (10m) is the METAR anemo exposed at the correct height. The R04 anemometers readings are not corrected - this is being investigated
Humberside	NJ	10m x1 8m x1	The R20 anemometer is the METAR anemo at 10 metres. No corrections are required for the readings from the R02 anemometer.
Inverness	PE	10m x3	Standard
Islay	PI	10m x1	Standard
Kirkwall	PA	10m x1 8m x1	No corrections are required for the readings of the R27 METAR anemometer.
Leeds/Bradford	NM	10m x2	Standard
Liverpool	GP	10m x2	Standard
London City	LC	6m x2	Located in the transition zone. Algorithm applied to compensate for non-standard height.
London Luton	GW	10m x1 6m x1	The Luton Airport anemometer serving R26 has been replaced from the glideslope aerial to its own independent mast since the last Met Audit. It's height has been reduced from 15 to 10 metres and now conforms to the correct exposure.
London/Gatwick	KK	7m x2	Located in the transition zone. Algorithm applied to compensate for non-standard height.
London/Heathrow	LL	6m x4	Located in the transition zone. Algorithm applied to compensate for non-standard height.
Lydd	MD	10m x1 6m x1	R21 anemometer is the METAR anemo. The R03 anemometer (local reports) is 6 metres tall on its own independent mast - no correction is required for its readings.
Manchester	CC	10m x3 6m x2	The R23R/05L are at standard heights. The other runway anemometers are located within the transition zone and have algorithms to compensate for non-standard height
Manston	MH	10m x3	Standard
Newcastle	NT	10m x1	Standard
Newquay	HQ	10m x1	Standard
Norwich	SH	10m x1	Standard
Prestwick	PK	10m x2	Standard
Scatsta	PM	8m x2	No corrections required for the readings
Scilly Isles	HE	8m	No corrections required for the readings
Shoreham	KA	10m x1	Standard
Southampton Int	HI	10m x2	Standard
Southend	MC	10m x2	Standard

Stansted	SS	6m x2	Located in the transition zone. Algorithm applied to compensate for non-standard height.
Stornoway	PO	10m x1	Standard
Sumburgh	PB	6m x3	Located in the transition zone. Algorithm applied to compensate for non-standard height.
Tiree	PU	10m x3	Standard
Wick	PC	10m x1	Standard