



July 13, 2017 Session #1

In Lieu of the Surface Observation

Including

EWINS Authority, RTMA, Web Cams,
and Remote Observation Systems

Part 121 Operator Perspective: Equivalent Level of Safety Using Remote Observations

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Friends/Partners Aviation Weather (FPAW)

July 12-13, 2017

NTSB offices, Washington DC

Missing METAR Problems

Current Status

Cause #1: Distribution Communications Outage

Immediate Fix (any airport worldwide)

- Search other sources & enter into airline system if found
- Sources: Other databases, ATC Tower or local Wx ofc.

Longer Process Solution

- NWS Telecommunications Ops Center (TOC) &/or IATA



Cause #2: Automated Obs Equipment Outage

Immediate Fix (US airports)

- FAA Contract Wx Observer: Human augmentation
- FAA Tower (If towered & if have backup Wx instruments)

Longer Process Solution

- NWS AOMC or FAA Ops Center



Operational Impact:

Can not land, nor depart from, nor use as an alternate, until data available.

Is Missing METAR Data a significant issue?

Answer: It Depends

Not Significant:

- IF Data is missing for destination airport & the METAR data can be obtained prior to arrival.

or

- IF Local FAA Principal Operating Inspector (POI) Office approves alternative procedures & they are included in the airline's Operational Specifications (Ops Specs) document.

Significant for Many Operators:

- AAL, DAL, FedEx, UAL, etc.
- DAL examples:
 - 221 Missing METAR cases in last 1 year
 - Recent Significant Impact at Rhineland:

EXAMPLE	RHI MISSING VIS
Missing Date	20 & 21 May 2017
Missing Time	Updated report filed 16z 21 May
Missing Items	Visibility
Contacted	ASOS & GRB NWS FOR UPDATE
Operational Impact	MISSING SINCE 20/1953Z. 1 FLIGHT STUCK IN RHI CANNOT DEPART. 2 FLTS TODAY THAT CANNOT TAKE OFF INBOUND TO RHI. LAST FLT TODAY IS OVERNIGHT AND WILL AFFECT FIRST FLT IN AM SO 4 FLTS SO FAR ARE AFFECTED. CONTACTED GRB NWS. TECHNICIAN CANNOT FIX..PARTS ON BACK ORDER. NO ESTIMATE OF REPAIR. ...

Can the Flying Public be Better Served? Rhineland, WI (RHI) Example

METARs

KRHI 221953Z AUTO 24010G17KT **10SM** FEW042 FEW049 OVC060
13/06 A2980 RMK AO2 RAB28E51 SLP095 P0000 T01280061 TSNO=

KRHI 221853Z AUTO 25011G18KT FEW039 BKN049 OVC075 13/05
A2979 RMK AO2 PK WND 24027/1822 SLP093 T01330050 TSNO \$=

Visibility missing for a total of 48 hours

KRHI 202053Z AUTO 08011KT -RA SCT050 BKN080 OVC090 09/05
A3005 RMK AO2 SLP189 P0002 60002 T00940050 58017 TSNO=

KRHI 201953Z AUTO 10015KT -RA OVC055 12/03 A3009 RMK AO2
RAB44 SLP200 P0000 T01170033 TSNO \$=

KRHI 201853Z AUTO 10019G25KT **10SM** FEW055 OVC090 13/M01
A3009 RMK AO2 PK WND 08031/1800 SLP199 T01331006 TSNO=

It was not clear skies &
a million miles Visibility.
But, visibility was more



than adequate for safe
operations during the
entire outage at RHI over
those 2 days!

Can the Flying Public be Better Served? Rhineland, WI (RHI) Example

- Unable to depart RHI for 2 days because ASOS visibility was not in METAR



- Could not fly into RHI either.

Customers were the losers

Missing METARs

Proposed Short & Long Term Solutions

SHORT TERM Implementation

Use EWINS Authority

For Missing Altimeter or Temperature

Any Airport in the World:

- **Altimeter**
 - Use Nearby Stn's Altimeter & Adjust DH (Decision Height) / Minimum Decision Altitude (MDA)
- **Temperature (If RTMA not available)**
 - Use Nearby Stns' Temperatures & Enhanced Wx Info System (EWINS) approved Met will finalize value

For Wind, Visibility, Present Wx &/or Sky Condition

- EWINS approved Met & Operator's FAA Liaison to contact FAA CMO on case-by-case basis for formal OK.



LONGER TERM Implementation

Use NWS' Real Time Mesoscale Analysis (RTMA) Product

For Missing Variables in addition to Temperature

- NWS in Coordination with FAA plans to perform an analysis of RTMA accuracy

SYSTEM FAILURE
**KEEP
CALM
AND
PRESS
CTRL+ALT+DEL**

Can the Flying Public be Better Served?

Answer: It Depends

Use EWINS Authority-Short Term

- Delta facilitated discussions in May & June with Industry, NWS & FAA.
- Delta has completed analysis of use of nearby altimeter values

- **1.28M Hours sampled for 10 hub airports each with 6 remote altimeter ready stations (each station at least 2 years of data)**

- 70 hrs of the 1.28M hrs missed the altimeter set based on the round up to the next 100 ft procedure.
- Approx 60% missed high - which would increase the safety margin between aircraft & obstacles.
- approx 60% were also during conditions that would eliminate the use of the procedure due to pressure falling rapidly (tstrm in vcnty, etc)
- That leaves less than 20hrs that miss low without an explanation of the 1.28M hours.

Use of RTMA - Longer Term

- A4A Member Airlines; FAA; & NWS coordinated in late 2014 & 2015
 - Use of RTMA for Temperature was approved eff 01 June 2015.
- A4A Member Airlines have requested expanded use of RTMA to other missing METAR variables.
 - NWS is in process of getting funding to perform an analysis
 - Est analysis completion date Sep 2018

Data Analysis of Proposed Procedures – Status

- ✓ **Missing Altimeter:** Procedure is the furthest along & appears sound
 - Uses adjustment to landing minimums based on remote airport distance & elevation change
 - Similar to one used by FAA when constructing approach procedures
 - Considers factors at the proposed remote location such as PRESRR/PRESFR, fronts, strong pressure gradients, & 1st METARS after a period of no reporting
 - Final procedure will be mindful of impact of pressure on takeoff performance
 - Airport & aircraft capabilities will be factored into decision-making
- ✓ **Missing Temperature:** Concept is mostly developed & needs further analysis
 - Single remote station has not proven accurate in early analysis
 - Consideration for effect of temperature on a/c performance will be key in final procedure
- ✓ **Missing Visibility, Wind, & Present Weather:** Procedures are in their infancy.
 - Airport & aircraft capabilities will be factored into decision-making
- ✓ **Ceiling:** Rarely required by regulations,
 - But might be significant in operational decision-making where METAR data are missing.



Missing METAR Data

Apply SMS & EWINS Authority

Use of Safety Management System (SMS)

Development of procedures for operating when METARS or portions of METARS are missing is based on SMS principals – ensuring risk is reduced to an acceptable level.

Weather Conditions & Physical Environment

- How far away is/are remote source(s)?
- What is observed on satellite imagery?
- What is being observed on radar?
- Are there frontal systems in the area?
- Are there other weather systems in the area that might invalidate a remote station?
- Are there terrain considerations which might invalidate a remote source?

Aircraft & Flight Crew Capabilities

- Is pilot in command low time?
- Navigation capabilities of aircraft?
- Is aircraft equipped with a radar altimeter?
- Is aircraft equipped w/ EGPWS?
- What is the performance impact for an imperfect estimation?
(headwind/tailwind, pressure, temperature)

Airport Equipment & Airport Capabilities

- ATC tower on the airport?
- ATC offer radar coverage of the area?
- Precision instrument approach available?
- Runway have visual glideslope guidance?
- What is the MSA?
- What are circling minimums?



Missing METAR Data Summary & Goals

Summary

Work is underway on both Short and Longer Term Implementation Efforts
to Address missing METAR data
&
to Better Serve the Flying Public
while
Maintaining a Comparable Level of Safety.

Goals:

- **Short Term** - EWINS Authority procedures for Altimeter & Temperature
 - Complete coordination with FAA & NWS - Target Date: 01 August 2017
- **Longer Term** - RTMA use for missing variables other than Temperature
 - Complete analysis by NWS of RTMA accuracy - Target Date: 30 Sept 2018