



LWES Operational Demonstration

FedEx Express – FAA - SureWx
Winter 2014-15

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Outline

- FedEx Operational Overview
- Why LWE? - Benefits
- Operational Demonstration Process overview
- ACARS formatting
- 2014-2015 Operational Demonstration

FedEx Operational Overview

- Deliver the “World on Time”
- 1200 flights per day
- Each aircraft impacts thousands of customers
- Time is critical
- Global citizenry

Why FedEx Chose LWES

Decision Support Tool:
Improved Ops Results

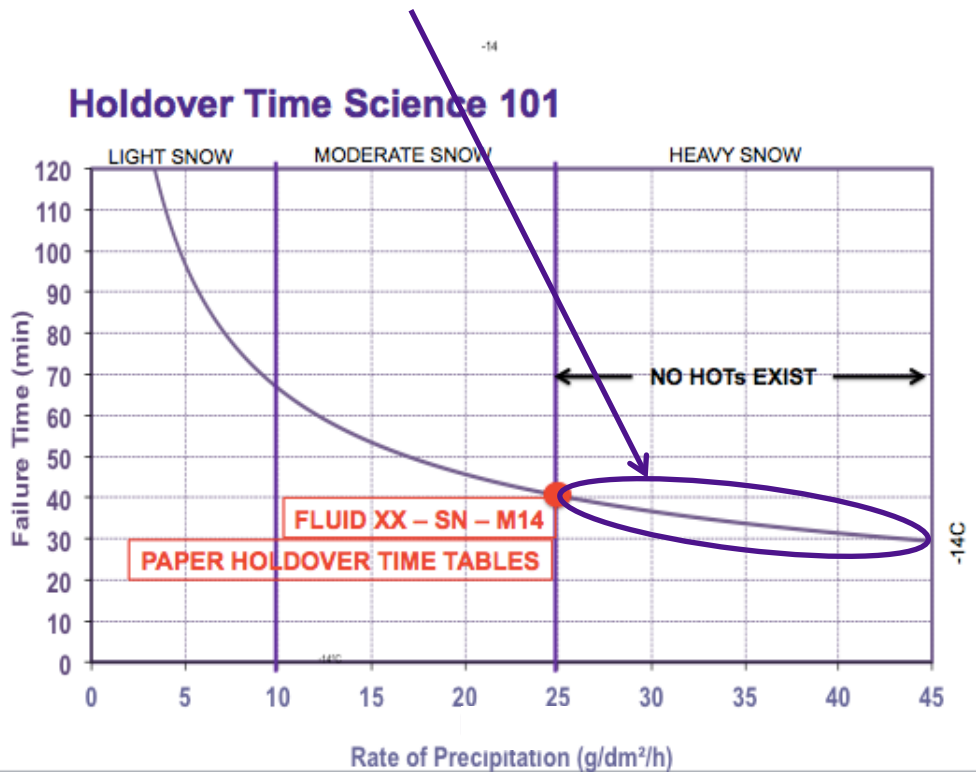


OFFICIAL FAA HOLDOVER TIME TABLES



WINTER 2013-2014

Tap FULL potential of HOT's:
Exploit Most Current HOTS Science



Why FedEx Chose LWES

Extend operational boundaries:
Enhance Safety and Efficiency

Potential Operational Cost Savings:
Reduction of Delays and Fluid Usage

TABLE 1C. SNOWFALL INTENSITIES AS A FUNCTION OF PREVAILING VISIBILITY

Time of Day	Temp.		Visibility in Statute Miles (Meters)									Snowfall Intensity
	Degrees Celsius	Degrees Fahrenheit	≥ 2 1/2 (≥ 4000)	2 (3200)	1 3/4 (2800)	1 1/2 (2400)	1 1/4 (2000)	1 (1600)	3/4 (1200)	1/2 (800)	< 1/4 (< 400)	
Day	colder/equal -1	colder/equal 30	Very Light	Very Light	Very Light	Light	Light	Light	Moderate	Moderate	Heavy	
	warmer than -1	warmer than 30	Very Light	Light	Light	Light	Light	Moderate	Moderate	Heavy	Heavy	
Night	colder/equal -1	colder/equal 30	Very Light	Light	Light	Moderate	Moderate	Moderate	Moderate	Heavy	Heavy	
	warmer than -1	warmer than 30	Very Light	Light	Moderate	Moderate	Moderate	Moderate	Heavy	Heavy	Heavy	

NOTE 1: This table is for estimating snowfall intensity. It is based upon the technical report, "The Estimation of Snowfall Rate Using Visibility," Rasmussen, et al., Journal of Applied Meteorology, October 1999 and additional in situ data.

NOTE 2: This table is to be used with Type I, II, III, and IV fluid guidelines.

NOTE 3: If visibility from a source other than the METAR is used, round to the nearest visibility in the table, rounding down if it is right in between two values. For example, .6 and .625 (5/8) would both be rounded to .5 (1/2).

HEAVY = Caution—No Holdover Time Guidelines Exist



FAA Operational Demonstration

Collaborative process: FedEx – FAA - SureWx

Operational Demonstration FAA template

- Vendor
 - Operational Demonstration plan, airport sites, training
 - HOT Determination System (HOTDS) reliability/maintenance
- Operator
 - Standardized training/guidance
 - Request LWE Ops Spec A023
- FAA
 - **Operational Demonstration Plan Goal:** AUTHORIZE any requesting operator to use LWES via a standard A023
 - **Operational Demonstration Goal:** Pathway to REGULATORY approval

One Stop ACARS Messaging for LWE Based HOT

- Simple “HOT” ACARS “Ops Control” Message
- Familiar to pilots
- Reduce the chance for error
- Ease of use for the crew force

ACARS LWE Messaging

```
SUREWX HOT REPORT      1/2
KIND AIRCRAFT NXXXFE
LWE DIIS HOTDR KIND
1401272320Z
SN M3.5C

TYPE I
HOT: 15 MIN

                                           2/2

TYPE IV: DOW UCAR
ENDURANCE EG106
CONCENTRATION 100/0
HOT: 120 MIN

TYPE IV: KILFROST ABC-S
PLUS
CONCENTRATION: 100/0
HOT: 100 MIN
```


ACARS Messaging LWE

System logic to address specific regulatory boundaries

```
SUREWX REPORT 1/2
KIND01 AIRCRAFT N999FE
DIIS KIND01
1401270420Z
FZRA M2.0
TYPE I
HOT: USE HOLDOVER TABLES
```

```
2/2
TYPE IV: DOW UCAR ENDURAN
CE EG106 100/0
HOT: USE HOLDOVER TABLES
TYPE IV: KILFROST ABC-S PLUS
CONCENTRATION: 100/0
HOT: USE HOLDOVER TABLES
```

Precipitation other than snow detected – Outside of current regulatory boundary

ACARS Messaging Exceptions

System logic to address specific operational exceptions

```
SUREWX REPORT 1/1  
KMCI01 AIRCRAFT N999FE  
USE HOLDOVER TABLES
```

Unified process – locations where HOTDS not available

Operational Demonstration Trial 2014

Trial parameters successfully tested:

- Reliable ACARS interface : HOTDS ↔ FedEx aircraft
(did not use information for operational decision making)
- Multiple cities/International operations: MEM, YYC, YEG, YYZ
- Multiple a/c types: A300, 757, MD10, MD11
- Equipped and unequipped airport locations
- Weather conditions: Clear, Rain, Snow

Summary message log sample →

Zulu Date	Time	Flight	Request	Response
18-Apr	13:06	233	dep CYYZ for KMEM	HOT requested before departure and response provided.
22-Apr	0:25	121	dep CYEG for KMEM	HOT requested before departure and response provided.
24-Apr	1:59	135	dep CYYC for KMEM	HOT requested before departure and response provided.

Operational Demonstration 2015

- Full Rollout to FedEx Crew Force
- Heavy snow added
- Working with SureWx and FAA to add freezing precip other than snow
- iPad App backup
- Feedback loop through normal Pilot Ops Reports

Questions:

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