



sureHOT

electronic holdover time service

WEATHER SOLUTIONS AND OPERATIONAL SUPPORT SYSTEMS



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What we do



Weather and
operational
support solutions
for airport and
air carrier
applications



Holdover Time Science 101



WEATHER SOLUTIONS AND OPERATIONAL SUPPORT SYSTEMS

Holdover Time Tables

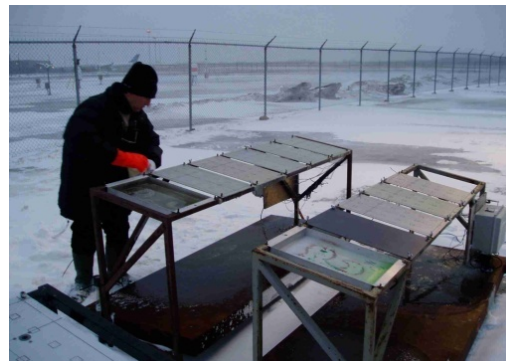
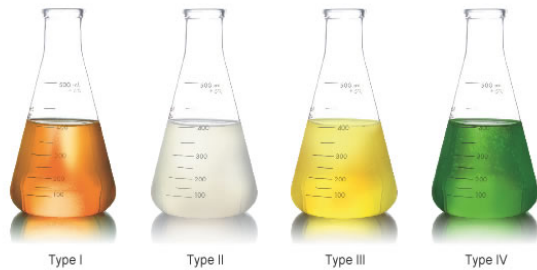


CAUTION: THIS TABLE IS FOR DEPARTURE PLANNING ONLY AND SHOULD BE USED IN CONJUNCTION WITH PRETAKEOFF CHECK PROCEDURES.

Outside Air Temperature		Manufacturer Specific Type II Fluid Concentration Neat-Fluid/Water (Volume %/Volume %)	Approximate Holdover Times Under Various Weather Conditions (hours: minutes)						
Degrees Celsius	Degrees Fahrenheit		Active Frost	Freezing Fog	Snow/Snow Grains	Freezing Drizzle ^a	Light Freezing Rain	Rain on Cold Soaked Wing ^{**}	Other [‡]
-3 and above	27 and above	100/0	8:00	3:30-4:00	1:00-1:35	1:20-2:00	0:45-1:25	0:10-1:30	CAUTION: No holdover time guidelines exist
		75/25	5:00	2:30-4:00	0:40-1:20	1:15-2:00	0:30-0:55	0:05-1:20	
		50/50	3:00 [†]	0:55-1:45	0:10-0:25	0:20-0:30	0:10-0:15		
below	below	100/0	8:00 [†]	0:55-1:45	0:40-1:05	***0:35-1:30	***0:25-0:45		
-3 to -14	27 to 7	75/25	5:00 [†]	0:40-1:10	0:20-0:40	***0:25-1:10	***0:30-0:40		
below	below	100/0	8:00 [†]	0:30-0:50	0:15-0:30				
-14 to -25	7 to -13								
below -25	below -13	100/0	CLARIANT SAFEWING MP II FLIGHT Type II fluid may be used below -25 °C (-13 °F) provided the freezing point of the fluid is at least 7 °C (13 °F) below the OAT and the aerodynamic acceptance criteria are met. Consider use of SAE Type I when CLARIANT SAFEWING MP II FLIGHT Type II fluid cannot be used.						

- ✈ De/anti-icing fluid holdover times are an important tool in the safety of winter flight operations
- ✈ Significant amount of research and development was performed and the quality of the data employed in the current holdover time tables is excellent

Fluid Testing



CAUTION: THIS TABLE IS FOR DEPARTURE PLANNING ONLY AND SHOULD BE USED IN CONJUNCTION WITH PRETAKEOFF CHECK PROCEDURES.

Outside Air Temperature		Manufacturer Specific Type II Fluid Concentration Neat-Fluid/Water (Volume %/Volume %)	Approximate Holdover Times Under Various Weather Conditions (hours: minutes)						
Degrees Celsius	Degrees Fahrenheit		Active Frost	Freezing Fog	Snow/Snow Grains	Freezing Drizzle*	Light Freezing Rain	Rain on Cold Soaked Wing**	Other†
-3 and above	27 and above	100/0	8:00	3:30-4:00	1:00-1:35	1:20-2:00	0:45-1:25	0:10-1:30	CAUTION: No holdover time guidelines exist
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-3 to -14	27 to 7	75/25	5:00†	0:40-1:10	0:20-0:40	***0:25-1:10	***0:30-0:40		
below	below	100/0	8:00†	0:30-0:50	0:15-0:30				
-14 to -25	7 to -13								
below -25	below -13	100/0	CLARIANT SAFEWING MP II, FLIGHT Type II fluid may be used below -25 °C (-13 °F) provided the freezing point of the fluid is at least 7 °C (13 °F) below the OAT and the aerodynamic acceptance criteria are met. Consider use of SAE Type I when CLARIANT SAFEWING MP II FLIGHT Type II fluid cannot be used.						

Holdover Time Tables



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below	below	100/0	8:00 [†]	0:30-0:50	0:15-0:30				
-14 to -25	7 to -13								
below -25	below -13	100/0	CLARIANT SAFEWING MP II FLIGHT Type II fluid may be used below -25 °C (-13 °F) provided the freezing point of the fluid is at least 7 °C (13 °F) below the OAT and the aerodynamic acceptance criteria are met. Consider use of SAE Type I when CLARIANT SAFEWING MP II FLIGHT Type II fluid cannot be used.						

✈ The holdover time for any aircraft de/anti-icing fluid is a function of three variables:

- ✈ Rate of precipitation (LWE)
- ✈ Type of precipitation
- ✈ Ambient temperature

Holdover Time Tables



CAUTION: THIS TABLE IS FOR DEPARTURE PLANNING ONLY AND SHOULD BE USED IN CONJUNCTION WITH PRETAKEOFF CHECK PROCEDURES.

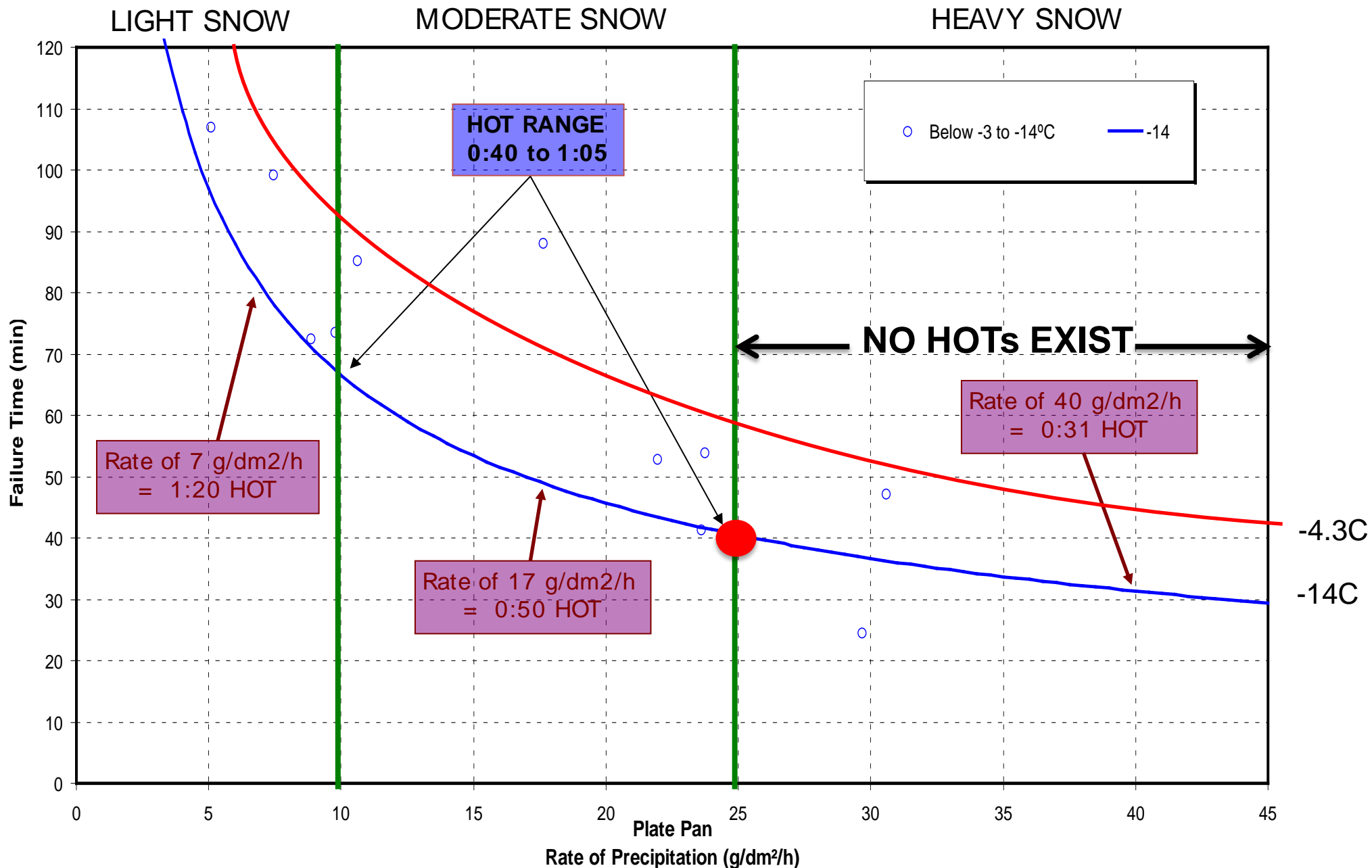
Outside Air Temperature		Manufacturer Specific Type II Fluid Concentration Neat-Fluid/Water (Volume %/Volume %)	Approximate Holdover Times Under Various Weather Conditions (hours: minutes)						
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		50/50	3:00 [†]	0:55-1:45	0:10-0:25	0:20-0:30	0:10-0:15		
below	below	100/0	8:00 [†]	0:55-1:45	0:40-1:05	***0:35-1:30	***0:25-0:45		
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0:40 – 1:05

✈ The holdover time for any aircraft de/anti-icing fluid is a function of three variables:

- ✈ Rate of precipitation (LWE) = ?
- ✈ Type of precipitation = Snow
- ✈ Ambient temperature = -4 Celsius

Holdover Time Science 101



Holdover Times



- ✈ Flight crew's ability to extract the proper information from the tables has not advanced with the science employed to build the tables
- ✈ Refinement of the “format” would allow for expansion of operational use of fluid holder times

- ✈ System consists of numerous sensors enabling the determination of:
 - ✈ Rate of precipitation
 - ✈ Type of precipitation
 - ✈ Ambient temperature
- ✈ System measurements used to generate an accurate holdover time (HOT) for each departing aircraft based actual conditions
- ✈ System output can be configured to generate HOT information according to the client's preference and operational needs



- ✈ All data from the sensor units in the field are transmitted via cellular network to the SureWx central server



DIIS IN THE FIELD

→
GPRS



SUREWX SERVER



END USER

Data Communication



DIIS CYUL

1401211755Z

SN M1

HLD OVR TYPE I 14 MIN

HLD OVR TYPE IV 78 MIN

DIIS CYUL

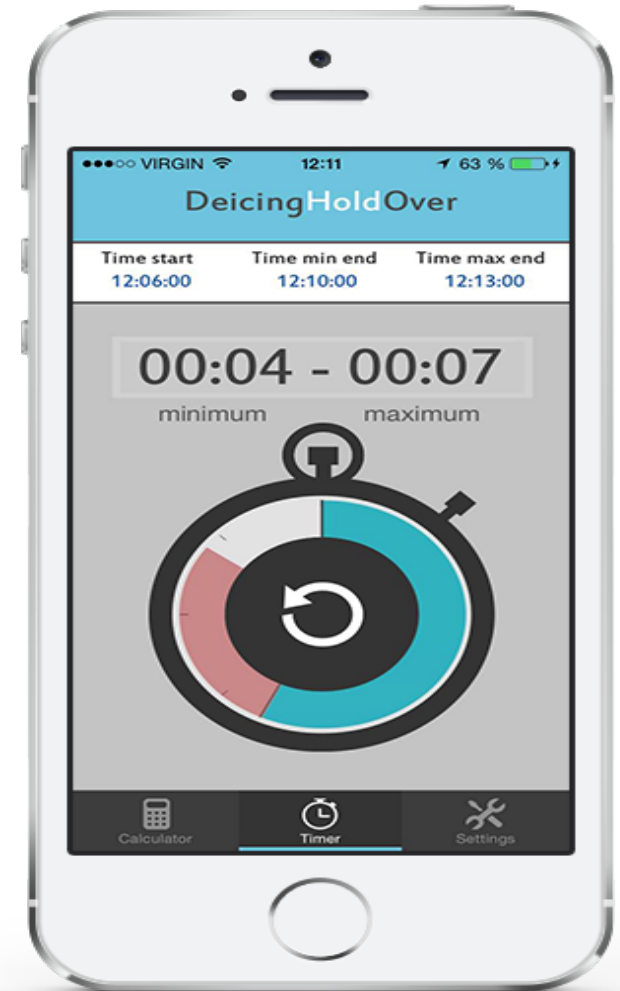
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FZRA M1

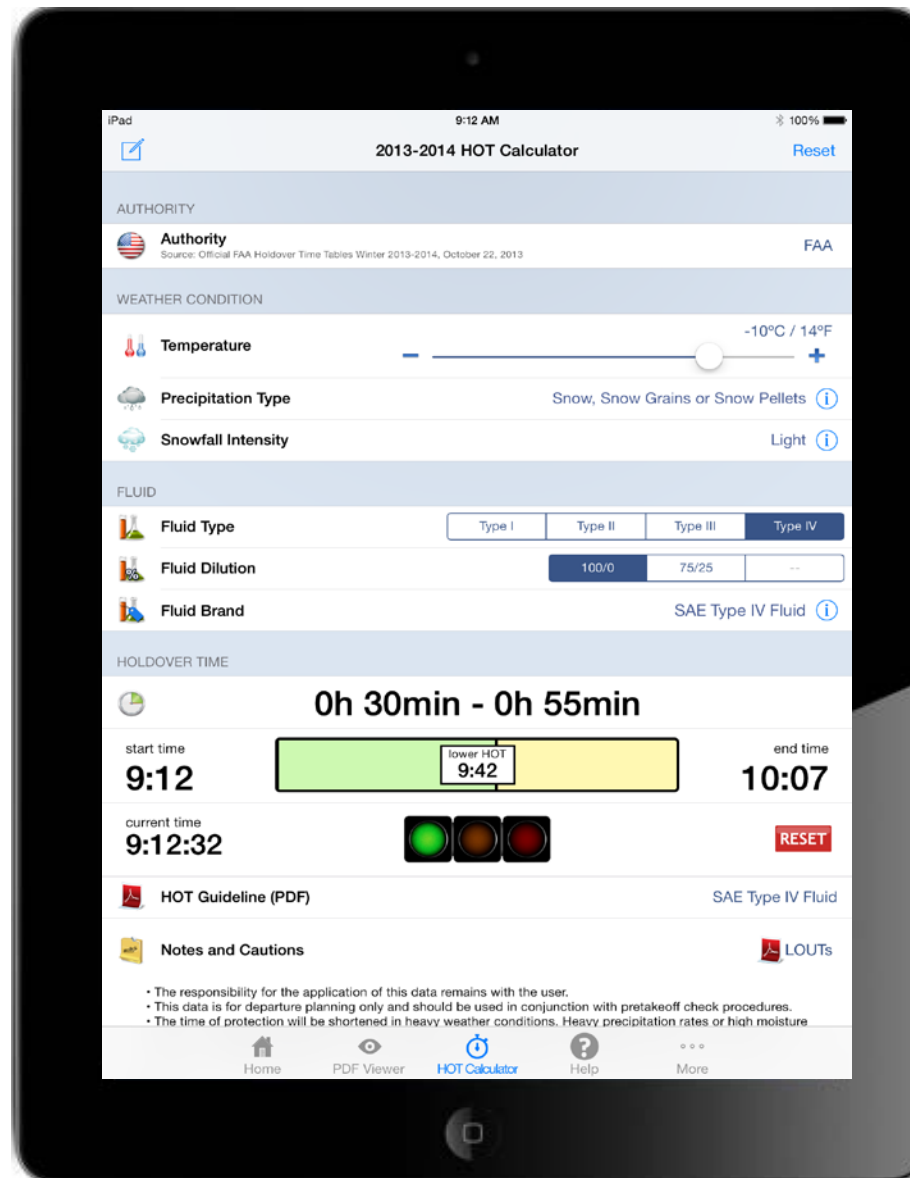
HLD OVR TYPE I 4MIN

HLD OVR TYPE IV 31MIN

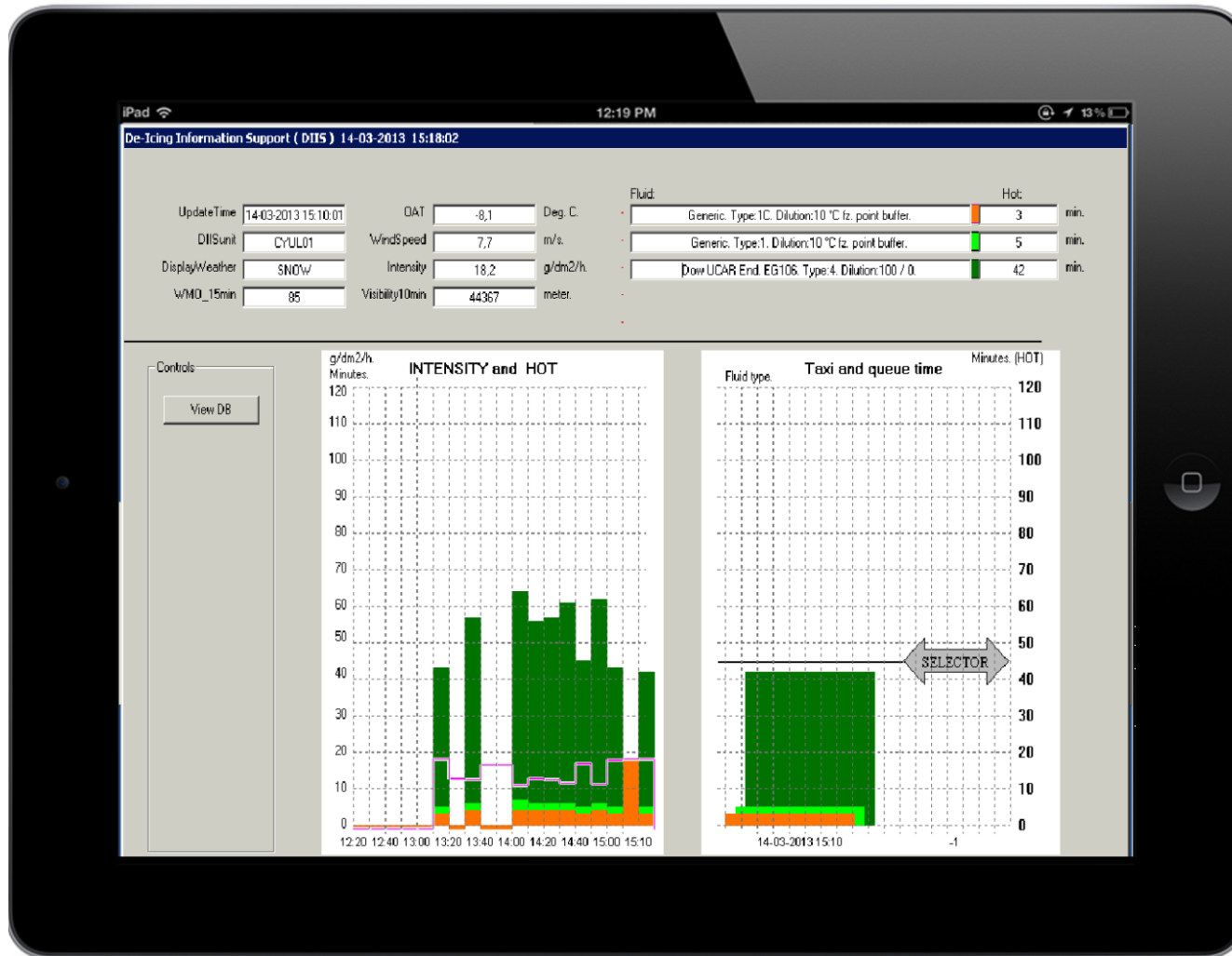
Applications



Applications





Applications



Web Portals





Log out Settings Weather Administration Contact

Weather data

Select columns to display
☐ Fluid 1
☒ Fluid 2 HOT
☒ Precipitation intensity
☒ Visibility
[Select all](#) / [Deselect all](#)

☒ Fluid 1 HOT
☐ Fluid 3
☒ Precipitation type
☒ Wind speed

☐ Fluid 2
☒ Fluid 3 HOT
☒ Temperature
☒ Wmo Code

Filter weather data
Records per page: 144 Airport: CYYZ01
Start date: 2011-10-01 Start time: 00:00
End date: 2012-04-15 End time: 23:50

☐ Save this search

1 2 3 4 5 6 ▶▶

Airport	Date	F1 HOT	F2 HOT	F3 HOT	Prec. int.	Prec. type	Temp. °C °F	Visibility m sm	Wind speed knot m/s	Wmo Code
CYYZ01	2012-03-28 21:10:01	6	5	120	3.3	ROCSW	10.0	49674	6.0	23
CYYZ01	2012-03-28 21:00:01	6	5	120	3.4	ROCSW	10.2	44824	5.0	23
CYYZ01	2012-03-28 20:50:01	6	5	120	3.4	ROCSW	10.4	25061	5.0	23
CYYZ01	2012-03-28 20:40:01	6	5	120	3.3	ROCSW	11.9	39695	6.0	23
CYYZ01	2012-03-28 20:30:01	6	5	120	3.1	ROCSW	11.9	33252	6.0	23
CYYZ01	2012-03-28 20:20:01	6	5	120	3.0	ROCSW	12.5	36071	5.0	01
CYYZ01	2012-03-28 20:10:01					CLEAR	13.3	36096	5.0	0
CYYZ01	2012-03-28 20:00:01					CLEAR	13.3	33715	6.0	0

Web Portals

A screenshot of a web browser displaying the SUREWx portal. The browser's address bar shows the URL "surewx.com/reports/heathrow_ba.php". The page has a dark navigation bar with the SUREWx logo and links for "Company", "Solutions", "Media", "Contact Us", and "Customer Area". The main content area is titled "Heathrow British Airways HOTs" and features the British Airways logo. It displays four sets of weather and operational data for different times on 03-02-2014. Each set includes conditions (Temp, Wind Speed, Rate, Weather Type, WMO Code), Generic Type I, and Clariant Safewing MP IV Launch Type IV for 75/25 and 100/0. The data is as follows:

Time	Conditions	Generic Type I	Clariant Safewing MP IV Launch Type IV 75/25	Clariant Safewing MP IV Launch Type IV 100/0
03-02-2014 12:40:01	Temp: 8,2°C, Wind Speed: 3,5m/s, Rate: N.A.g/dm2/h, Weather Type: HAZE, WMO Code: 4	N.A. minutes	N.A. minutes	N.A. minutes
03-02-2014 12:30:01	Temp: 7,9°C, Wind Speed: 2,4m/s, Rate: N.A.g/dm2/h, Weather Type: HAZE, WMO Code: 4	N.A. minutes	N.A. minutes	N.A. minutes
03-02-2014 12:20:01	Temp: 7,8°C, Wind Speed: 3,6m/s, Rate: N.A.g/dm2/h, Weather Type: CLEAR, WMO Code: 0	N.A. minutes	N.A. minutes	N.A. minutes
03-02-2014 12:10:01	Temp: 7,7°C, Wind Speed: 2,7m/s, Rate: N.A.g/dm2/h, Weather Type: HAZE, WMO Code: 4	N.A. minutes	N.A. minutes	N.A. minutes

Benefits

SUREx



WEATHER SOLUTIONS AND OPERATIONAL SUPPORT SYSTEMS

Benefits



- Improved operational planning for airports, carriers and service providers
- Enhanced ATC processes within A-CDM
- More frequent winter weather information for winter flight planning
 - More accurate identification of de/anti-icing conditions
 - Better identification of changing weather
- Accurate determination of fluid holdover times
 - Enable better fluid selection
 - Enable expanded use of current holdover time information
 - Expanded holdover times for all fluids, including Type I
 - Reduction of human factor involvement in holdover time assessment
 - Reduction of departures with exceeded fluid holdover times
- Economic Savings

Benefits



- Reduced costs of fluids and recovery/ recycling
- Source Reduction of Glycol
 - Reduction of environmental impacts and costs
- Operational Improvement
 - Airport throughput
 - Time management
- Airport Implications
 - Runway maintenance
 - Application of runway de/anti-icers

Commercial Service



- Transport Canada issued regulatory approval process for LWE systems in December 2007 (Exemption from CAR 602.11)
- SureWx completed operational assessment with WestJet 2008-10, and began commercial service in 2010
- FAA initiated Ops Demo for LWE systems in advance of winter 2013-14
- SureWx Ops Demo partner is FedEx

Installations

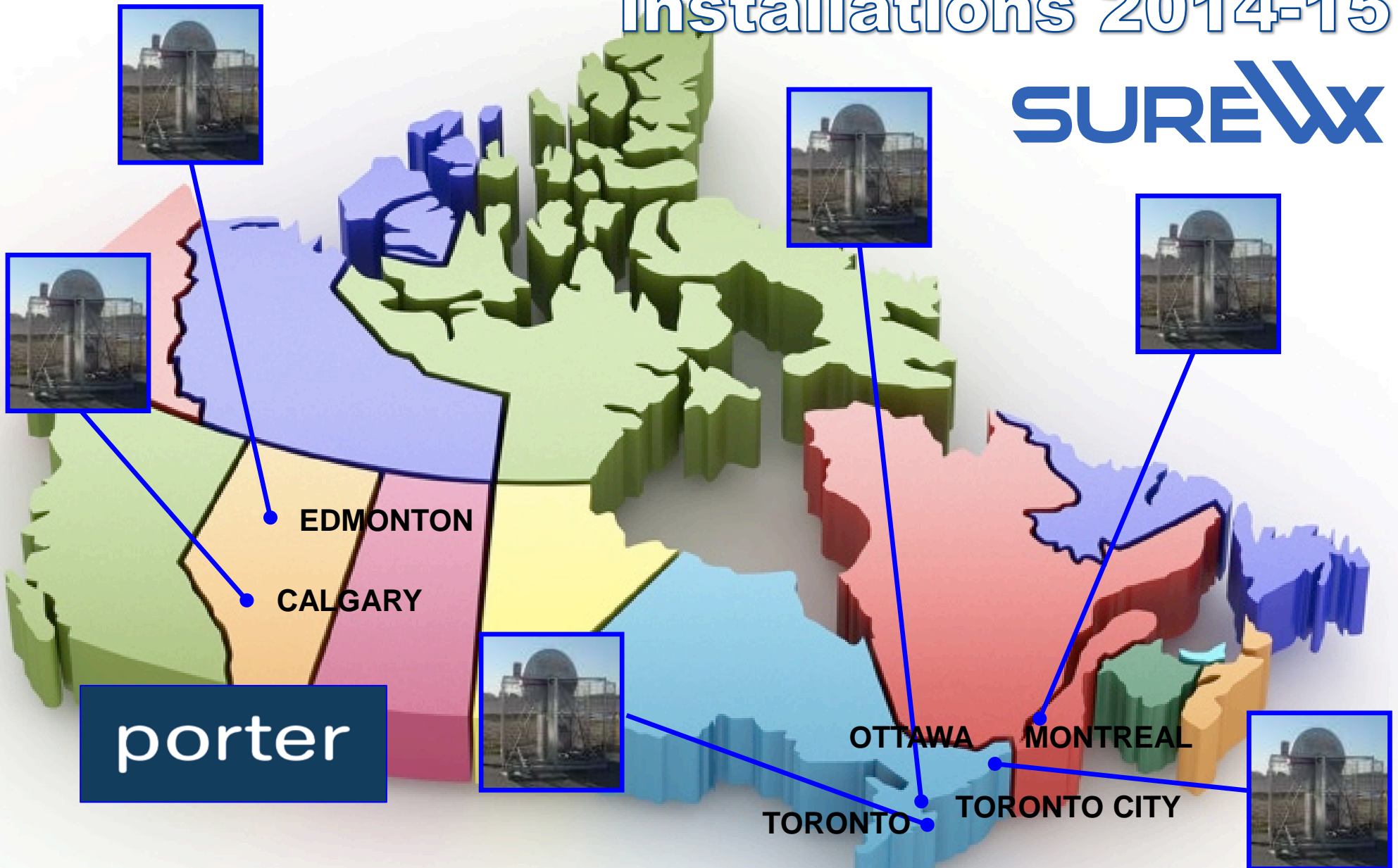
SURE~~LL~~x



WEATHER SOLUTIONS AND OPERATIONAL SUPPORT SYSTEMS

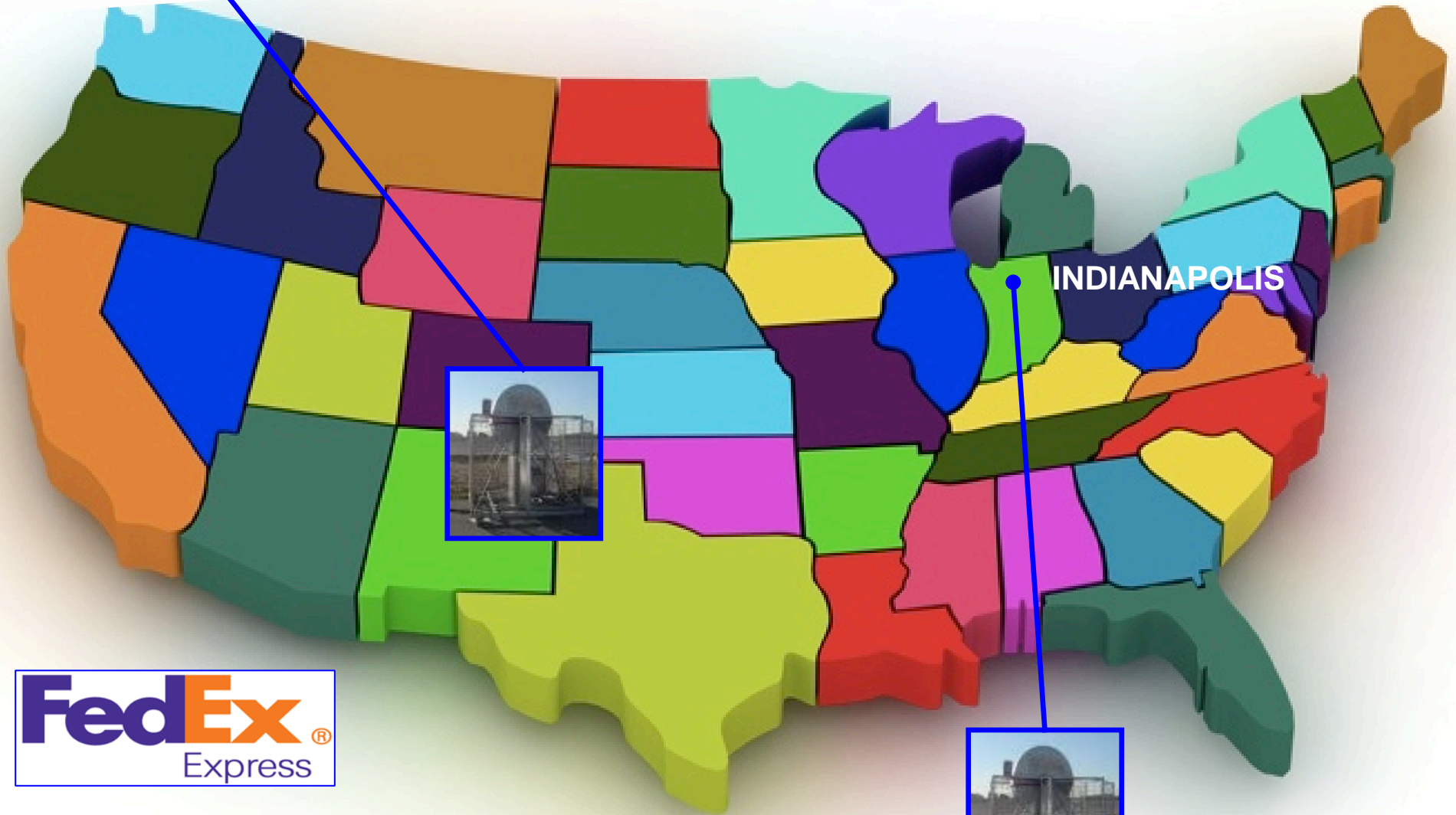
installations 2014-15

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installations 2014-15

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installations 2014-15

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BRITISH AIRWAYS



LONDON-HEATHROW

PARIS-CHARLES DE GAULLE

FedEx
Express



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WEATHER SOLUTIONS AND OPERATIONAL SUPPORT SYSTEMS