Segment 5

Progress in Elimination of Operational Limitations due to Lack of Access to or Regulatory Constraints on use of Weather Forecasts and Observations

1. Airline Operation Centers (AOC) access to Integrated Terminal Weather (ITWS) info

- ITWS provides graphical forecasts of Windshear/Microbursts for the airport environment
- Shows forecast locations of windshifts/microburst outflows

2. FAR 121.655 Applicability of Reported Weather Minimums.

- Reword to require the surface visibility, not the tower visibility, be controlling for VFR and IFR takeoffs and landings and for instrument approach procedures on all runways of an airport, when the reported visibility in the main body of the hourly report is less than 4 statute miles.
- Issue arises due to tall towers in clouds. Can report 0 visibility even though RVR 6000+. TAFs are then amended to below CAT III minimums.

3. Introduce a web based database for current active winds shear alerts & add WSP generated alerts to the current Terminal Weather Information for Pilots (TWIP) distribution system.

4. FAR 121.619 fuel load for alternate when CIG & VIS forecasted below 2000 feet and/or 3sm lowered to 1000 feet and/or 1sm.

- Regulation predates CAT II/III capabilities.
- With jet fuel approaching $2.50/gallon, can save industry $Millions each day.

CFR §121.619 of Title14

- The 1-2-3 Rule (A 1936 Regulation)
  - Section 121.619 states, in pertinent part, that no person may dispatch an airplane under instrument flight rules (IFR) unless he/she lists at least one alternate airport for each destination airport in the dispatch release.
  - However, no alternate airport is required if for at least 1 hour before and 1 hour after the estimated time of arrival at the destination airport the appropriate weather reports or forecasts, or any combination of them, indicate the ceiling will be at least 2,000 feet above the airport elevation; and visibility will be at least 3 miles.

Delta Air Lines Exemption Filing

- Initial Request 10/1/2004
  - Delta requests to reduce the weather required for not naming a destination alternate from the current § 121.619 requirement of at least 2,000-foot ceilings and at least 3 miles visibility to at least 1,000-foot ceiling and at least 1-statute-mile visibility based on the following additional requirements:
  - Only applicable to airports within the contiguous United States;
  - Each dispatcher will have a system to display the actual location of each flight and current, significant weather;
  - Delta will maintain at least CAT II approach authorization, Operations Specifications C059, for those fleets to which this exemption would apply;
  - The intended destination airport must have at least one operational CAT II approach;
  - The exemption cannot be used if thunderstorms are forecast in the main body of the weather report between 1 hour before to1 hour after the estimated time of arrival;

Exemption 8575

- Partial Exemption Granted June 27 2005
  - “1-1-2”
    - Delta granted relief from § 121.619 to the extent necessary to dispatch flights to domestic airports at which for at least 1 hour before and 1 hour after the estimated time of arrival at the destination airport the appropriate weather reports or forecasts, or any combination of them, indicate the ceiling may be reduced from at least 2,000 feet to 1,000 feet above the airport elevation, and visibility may be reduced from at least 3 miles to 2 miles.

Benefits to Delta

- Very Substantial Cost Savings Achieved
  - Additional Revenue Payload Opportunities
  - Reduced Wear on Aircraft Systems (brakes)
  - Elimination of Operational Fuel Stops
  - Significant Reduction in Fuel Purchases

5. FAR 121.621 Alternate Airport for Destination: Flag Operations

- Eliminate the time limitation of 6 hours on IFR -no alternate operations

6. FAR 121.645 requires an additional 10% fuel load for flag operations

- Regulation written when Oceanic wind forecasts were notoriously innacurate
- With automated aircraft wind reports and advanced global wind models, forecast errors are minimal
- Reduce additional fuel to 5%

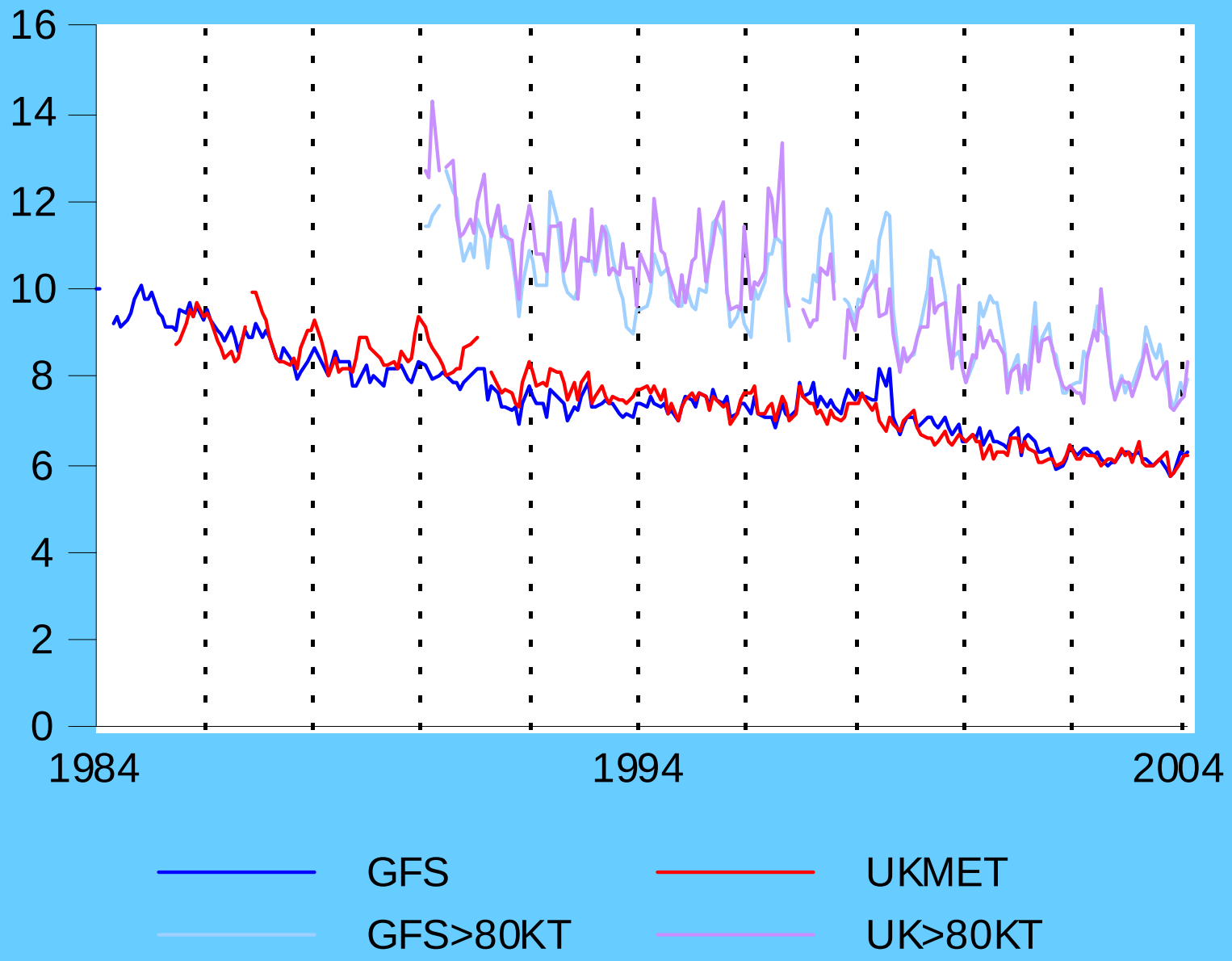


Figure 1: Northern Hemispheric average RMSV Error (knots) for 24 hr forecasts from US (GFS) and UK (UKMET) WAFCs. Separate plots shown for all wind speeds and for wind speeds greater than 80 knots.

7. RVR web site Summary Page with at-a-glance status

- Currently have to request each airport individually
- Color Code based on recent lowest RVR at each airport

Current RVR Page

RVR SDF

Back to menu

02:23:22 11/03/2005

RWY	TD	MP	RO	E	C
35R	6500	6500	6500	2	2
17L	6500	6500	6500	2	2
29	6500			2	
11			6500	2	
35L	6500	6500	6500	2	2
17R	6500	6500	6500	2	2

Proposed RVR Page

- Either a Map of the US with color-coded Identifiers based on current RVR
- Or, a table that is color-coded based on current RVR

RVR Airports:

ANC	ATL	BFI	BOS	BUR
BWI	CLE	CLT	CVG	DAL
DCA	DEA	DEB	DFA	DFB
DPA	DTW	EUG	EWR	GEG
GJT	HOU	IAD	IAH	ILG
IND	ISP	JFK	LAX	LGA
LGB	MCO	MDW	MEM	MFR
MIA	MRY	MSP	OAK	ONT
ORD	PDX	PHL	PHX	PIT

RVR less than 800

RVR 800-1300

RVR 1300-2500

RVR 2500-6000

RVR 6000+

RVR data not available

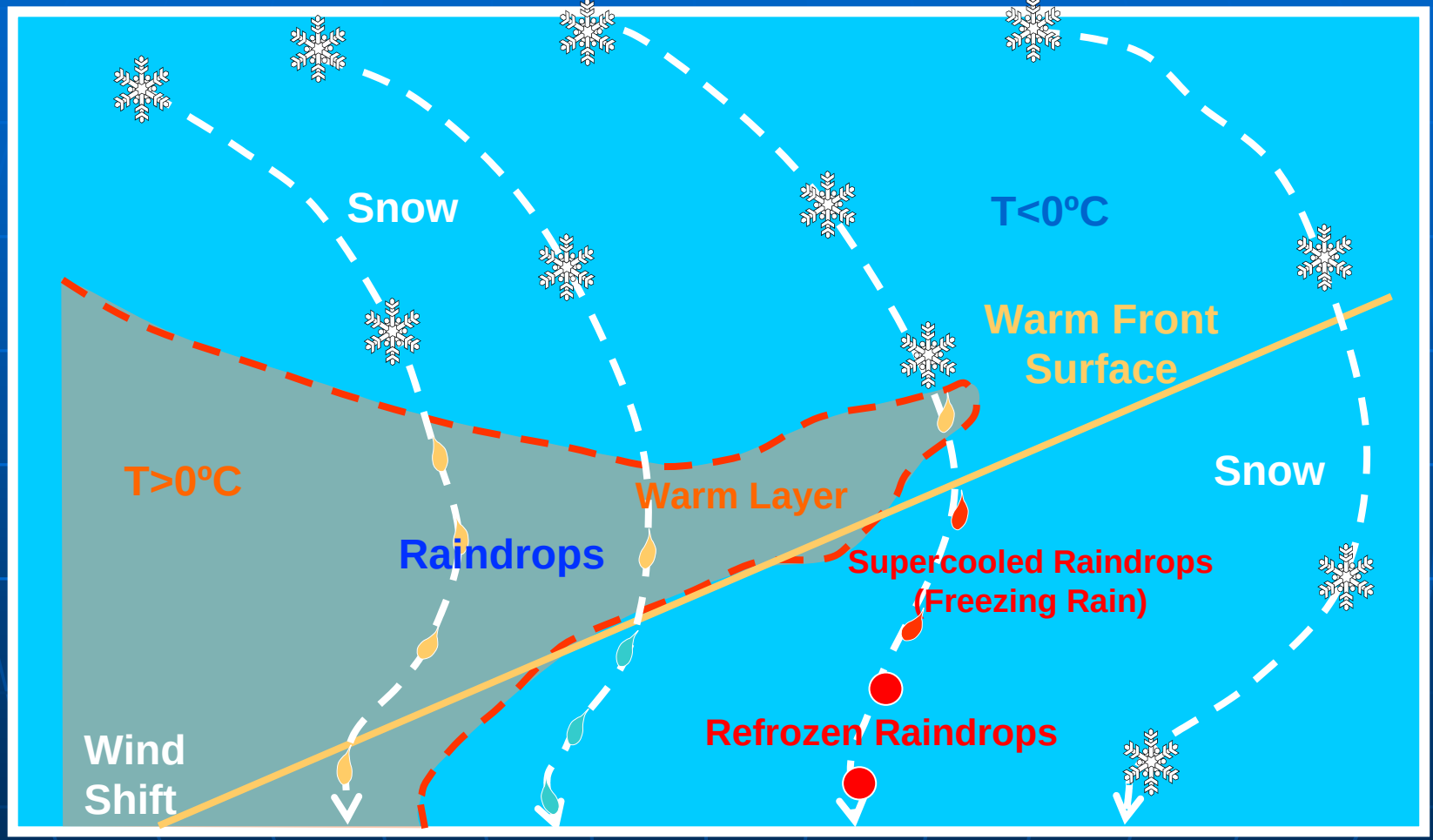
8. New FAA Interpretation of Holdover Times/Pretakeoff Contamination Check

- PL (Ice Pellets), GR (Snow Pellets), and IC (Ice Crystals/Diamond Dust) are not listed on holdover tables
- Until this year, Airlines could use Type IV fluid, and perform pre-takeoff contamination check within 5 minutes of takeoff.
- New FAA Notice say that if there is no Holdover time, the aircraft is grounded.
- Also asserts that Ice Pellets are too hazardous to take off in because of freezing rain aloft.

Ice Pellet Hold Over Times

- Ice Pellets common from N TX through the Ohio Valley into the Northeast.
- Recent FAA Guidance eliminates Pretakeoff Contamination check for Ice Pellets, Snow Pellets, and Ice Crystals (Diamond Dust).
- Essentially grounds aircraft during these events.

Ice Pellets = Frozen Freezing Rain



Water Content of Freezing Rain is the Same as Ice Pellets

Holdover Times should be similar, since water content of the precipitation is the main factor.

- Light Freezing Rain or Light Ice Pellets based on up to 0.10” per hour (25 grams/decimeter squared/hour).
- Moderate Freezing Rain or Moderate ice Pellets based on 0.10-0.30” per hour (25-75 grams/decimeter squared/hour).
- Light to Moderate Freezing DRIZZLE is based on Trace to 0.02” per hour (5 grams/decimeter squared/hour), hence much longer Holdover times.

AMIL (Anti-icing Materials International Laboratory)

- University of Quebec.
- Same facility used by the FAA to determine all Holdover times for all fluid types/brands.
- Same testing procedures as used for testing any other precipitation type.

AMIL Ice Pellet Project

Scope:

- Simulated ice pellets using frozen droplets made from freezing, supercooled precipitation and distributing them over fluid-coated test plates under freezing conditions.
- The anti-icing endurance time was then determined at two temperatures and at three intensities. The amount of precipitation ingested before the fluid failed was recorded.
- This amount of ice pellets was then added to the wind tunnel to determine whether the contaminated fluid would acceptably flow off according to the flat plate elimination test of Aerospace 5900.

AMIL Ice Pellet Project

Type IV Fluids tested:

- Kilfrost ABC-S
- Octagon Max Flight

Results

- Ice Pellet Holdovers very similar to Freezing Rain Holdover times.

- Elected to go with most conservative results, and limited the maximum holdover time to 45 minutes. Actual test results support much longer times.

Octagon Max-Flight Type IV

OAT °C	MODERATE Ice Pellets	LIGHT Ice Pellets	LIGHT Freezing Rain	Freezing Drizzle **(Mod-Light)**
-3 and Above	0:07-0:20	0:20-0:45	0:35-1:00	0:55-2:00
-3 to -14	0:05-0:10	0:10-0:30	0:20-0:40	0:25-1:10

Killfrost ABC-S Type IV

OAT °C	MODERATE Ice Pellets	LIGHT Ice Pellets	LIGHT Freezing Rain	Freezing Drizzle **(Mod-Light)**
-3 and Above	0:08-0:20	0:20-0:45	1:00-1:25	1:20-1:50
-3 to -14	0:06-0:20	0:20-0:30	0:10-0:30	0:20-1:00

Automated T-Storm Guidance