In-Flight Users Technical Interchange Meeting (TIM)

A4A Meteorology Work Group

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A4A Meteorology Work Group

- Affects of in-route icing can greatly vary in degree among carriers – due to equipment type, route structure etc. Typically wing/engine anti-ice systems mitigate the effects of icing during the vast majority of icing events. However weight and fuel penalties exist with their usage.
- Dispatchers always plan to minimize icing exposure during potential icing events, through selection of more optimal altitudes or routing.

Southwest Airlines Icing Policies/Procedures

- No Southwest Airlines aircraft will be dispatched or flown into known or probable severe icing conditions. Flights may be dispatched into light to moderate en-route icing conditions only if all aircraft anti-icing equipment is operable.
- No Southwest Airlines aircraft will be dispatched, continued en-route, or attempt a landing when, in the opinion of the Captain and/or Dispatcher, icing conditions exist or are anticipated which might adversely affect the safety of the flight.

Southwest Airlines Icing Policies/Procedures

- Dispatchers should consider the following during icing conditions:
  - Engine anti-ice during takeoff:
    - Engine anti-ice penalty must be planned by the Dispatcher if the OAT is 10°C or less and visible moisture in any form is present (e.g., clouds, fog with visibility of 1 mile or less, rain, drizzle, a ceiling of 1,500 ft AAE or less, or any form of frozen precipitation). Icing conditions also exist when the OAT is 10°C or less and snow, ice, standing water, or slush is reported on the runway surface.

Southwest Airlines Icing Policies/Procedures

- Engine anti-ice during landing:
  - The Dispatcher will plan the use of engine anti-ice if the forecasted temperature at the time of arrival is 10°C or below and the ceiling is forecasted below 1,000 ft AAE and/or visible moisture is forecast in any form (e.g., fog with visibility of one mile or less, rain, snow, sleet, ice crystals, or freezing drizzle/rain). This is not a requirement that must be met by regulation upon arrival if required conditions do not exist on arrival or were not forecast at the time of departure.

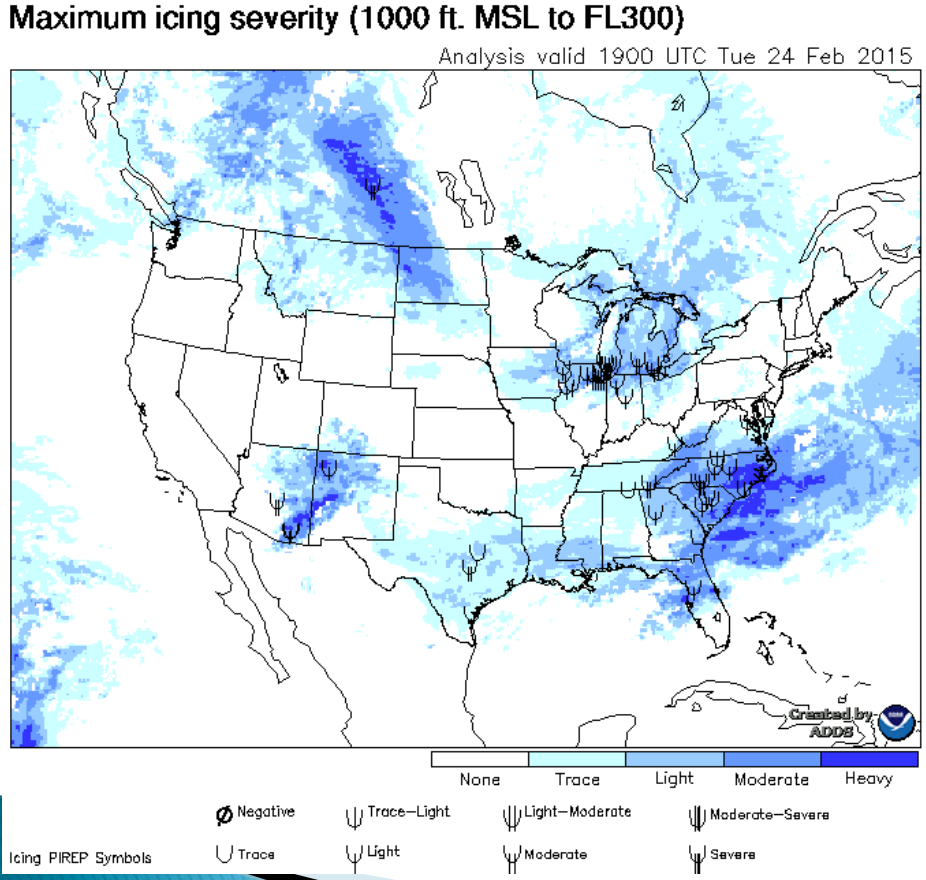
Southwest Airlines Icing Policies/Procedures

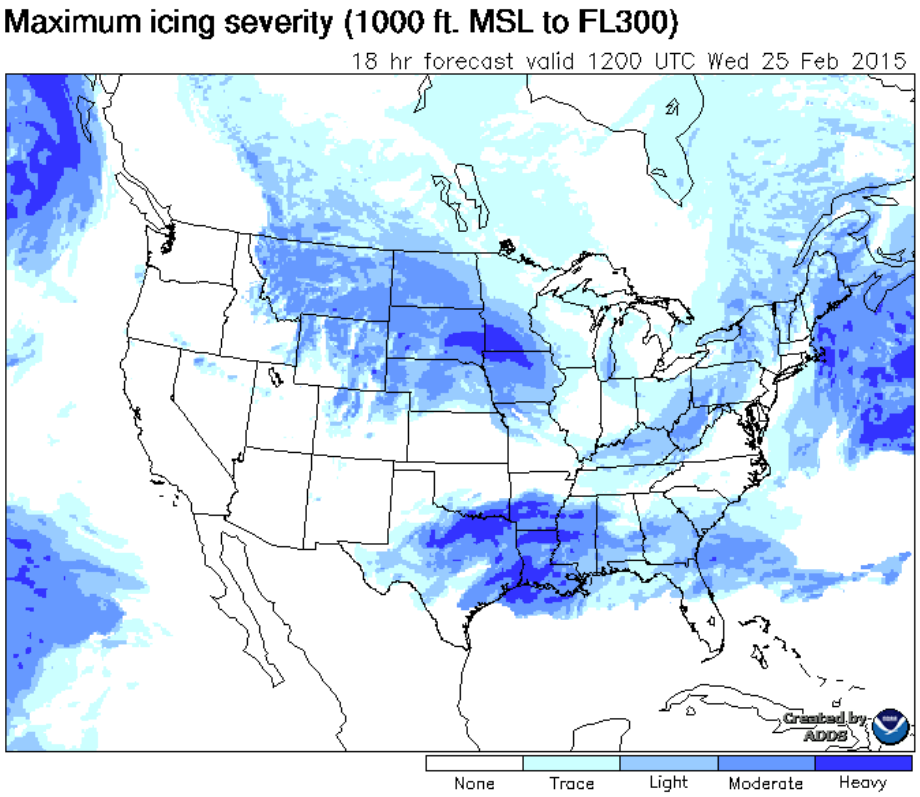
- Wing anti-ice during takeoff
  - Takeoff with wing anti-ice on will not be planned.
- Wing anti-ice during landing
  - Dispatch will plan wing anti-ice on during the planning stage if icing greater than light forecast below 1,000 ft at the time of arrival, or if freezing drizzle/rain is forecast at the time of arrival. Provided braking action is reported as not less than fair, Dispatch will normally plan a flaps 30 landing. The wing anti-ice restriction is not required by regulations upon arrival if required conditions for wing anti-ice do not exist on arrival or were not forecasted at the time of departure.

Southwest Airlines Icing Policies/Procedures

- En-route
  - En-route icing will be planned by Dispatch when icing is forecast or encountered and the destination temperature is below 10°C (8°C), or the use of anti-ice is anticipated at landing.

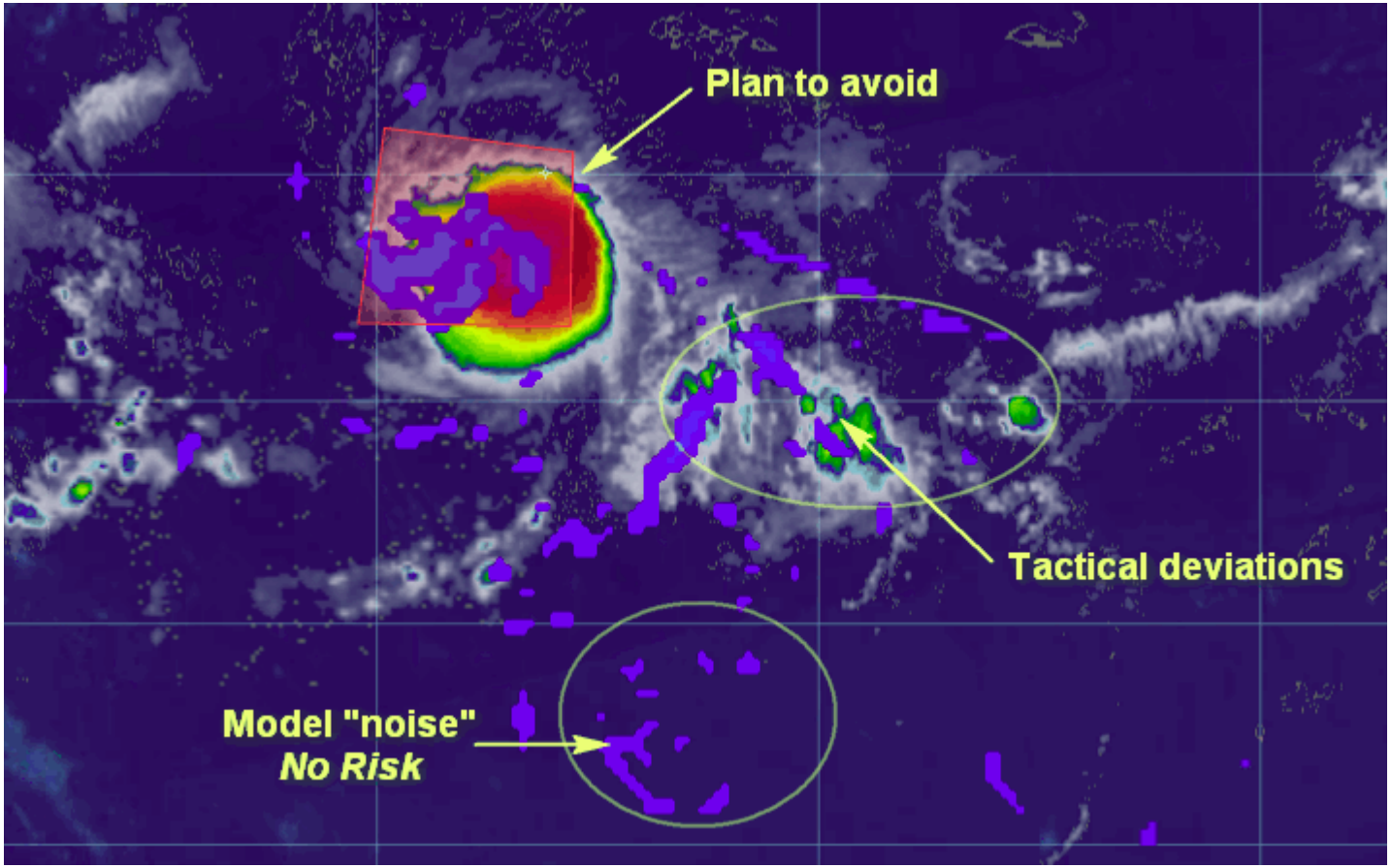
CIP/FIP


Maximum icing severity (1000 ft. MSL to FL300)
Analysis valid 1900 UTC Tue 24 Feb 2015
None
Trace
Light
Moderate
Heavy
Created by ADDS
Icing PIREP Symbols
Negative
Trace
Trace–Light
Light
Light–Moderate
Moderate
Moderate–Severe
Severe


Maximum icing severity (1000 ft. MSL to FL300)
18 hr forecast valid 1200 UTC Wed 25 Feb 2015
None
Trace
Light
Moderate
Heavy
Created by ADDS

High Ice Water Content

- FAA Airworthiness Directive AD 2013-24-01 Boeing 747-8, 747-8F and 787-8 airplanes powered by GEnx engines.
- Flight plan to avoid by 50nm all areas of HIWS risk associated with Mesoscale Convective Systems (MCS) (cloud shields greater than 60nm in diameter) in tropical environments.
- Use SIGMETS and other weather products to help identify MCS that meet avoidance criteria.
- Add discretionary fuel for tactical deviation around isolated convective activity. Monitor for un-forecast convective systems, suggest tactical reroute two hours prior to entering an area of newly forecast risk area.


Plan to avoid
Tactical deviations
Model "noise"
No Risk

“Cold Soaked” Icing

- The wings of aircraft are said to be “cold-soaked” when they contain very cold fuel as a result of having just landed after a flight at high altitude or from having been re-fuelled with very cold fuel.

- Whenever precipitation falls on a cold-soaked aircraft when on the ground, clear icing may occur. Even in ambient temperatures between -2°C and +15°C, ice or frost can form in the presence of visible moisture or high humidity if the aircraft structure remains at 0°C or below. Clear ice is very difficult to be detected visually and may break loose during or after takeoff.

- The following factors contribute to cold-soaking:
  - temperature and quantity of fuel in fuel cells
  - type and location of fuel cells
  - length of time at high altitude flights
  - temperature of re-fuelled fuel and time since re-fuelling.

Source NASA GRC Icing Branch

Thank You!

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Southwest