FAA SLC Air Traffic Control Tower, NWS SLC WFO and Southwest Airlines Collaborate on Aviation Discussion Guidelines

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The concept of an aviation section in the Area Forecast Discussion (AFD) was endorsed by NWS aviation customers at the National Aviation Workshop in 2003 and at the Western U.S. Aviation Workshop in 2004. NWS customers saw the need to overcome some of the restrictions that are inherent to the Terminal Area Forecast (TAF), such as the inability to indicate a 30 or 40 percent chance of weather affecting the terminal during the initial 9 hours of the TAF, severe weather potential, or ability to express forecaster confidence. Consequently, Western Region Headquarters (WRH) set policy in early 2005 for Weather Forecast Offices (WFO) to include a mandatory aviation discussion section in the AFD. Individual offices were given latitude to develop content and to define the audience/customer to which the aviation discussion was to be addressed. The Salt Lake City (SLC) WFO chose to direct its aviation discussion toward weather issues impacting the SLC International Airport since it is a 'pacing airport' that has an effect on the flow of air traffic nationally. As far as content, the only requirement was to keep it short and concise and not to make it a repeat of what already was covered in the TAF.

Within the first several months of the implementation of the aviation section to the AFD an increasingly large variety of information was being disseminated from Western Region offices. Some discussions were quite verbose and technical while other discussions did not add value to the TAF. In response, WR drafted an updated supplement to WR_10-503_2005. It established the following aviation discussion guidelines:

This section of the AFD should discuss scientific reasoning (using semi-technical language) and uncertainties regarding expected aviation related weather conditions. Weather conditions expected over complex terrain should be stressed, as well as in areas not covered by Transcribed Weather Broadcasts (TWEBS) that will impact air traffic and safety. Forecasters may use the AFD to discuss details not permitted in the Terminal Aerodrome Forecast (TAF) (i.e. confidence factors, areal coverage and probabilities).

Despite these more specific guidelines the aviation discussions for SLC continued to contain extraneous information and, at times, were too verbose. Consequently, an internal set of guidelines on the proper content for the aviation discussion were set forth with collaboration from one of SLC's primary customers; SLC's Air Traffic Control Tower (ATCT). Those guidelines were used extensively from late spring 2005 through May of 2006. In May 2006, the SLC WFO had the opportunity to host Mr. Rick Curtis (Manager Dispatch Solutions Systems for Southwest Airlines) at an aviation seminar. During his seminar Mr. Curtis stressed how much the aviation discussion was appreciated by Southwest Airline dispatchers. However, he shared two concerns, 1) lack of content consistency within the aviation discussion, and 2) not all WFOs were issuing aviation discussions for their respective pacing airports that are used by Southwest. A huge advocate and customer of the aviation discussion, Mr. Curtis suggested that a universal set of guidelines with specific content be adopted by the NWS. The guidelines established by WFO SLC and ATCT were shared with Mr. Curtis, which he reviewed, made suggestions to and approved. The following guidelines are a result of the collaboration efforts between NWS SLC WFO, FAA SLC ATCT and Mr. Curtis on behalf of Southwest Airlines. Of the guidelines presented, Mr. Curtis could not emphasize enough how important the timing of wind shifts and our degree of confidence of such was to his dispatchers at Southwest Airlines.

Discussion Content

Desired –

1) Cover your biggest concern. Where might the TAF go wrong?
2) Simple semi-technical mesoscale description of what is driving the weather.
3) Timing and degree of confidence of an event that has an impact on flight operations (onset or dissipation).
4) Timing and degree of confidence with respect to wind shifts.
5) Timing described in UTC.
6) Confidence level described as a percentage.
7) Concise discussion of 8 lines of text or less.
8) Reference climatology, conditional climatology, model forecasts, satellite and radar data.
9) Snow accumulations on the runway (call airport operations and ask for their surface and subsurface temperature observations).

Not Desired –

1) A repeat of our TAF.
2) Description of the synoptic pattern – that's covered in the regular discussion.
3) More than **8** lines of text.
4) Use of technical terms, i.e. subsidence, vorticity, model names, etc.
5) The term "likely" used about a parameter that is not mentioned in the TAF
6) Using probability terms for more than two parameters (i.e. chance of this, chance of that, and chance of something else) can be very confusing.

Possible Discussion Content

1) Reference to tower visibility verses surface visibility and RVRs.
2) Local studies suggest, etc.
3) Cloud seeding may allow for temporary improvements to IFR or MVFR, etc.

Examples

1) “Dense fog at SLC has a 30 percent chance of dissipating by 1600 UTC as models and climatology suggests visibilities improving to 3-5 miles. However, persistence suggests a 60 percent chance that dense fog will not dissipate until 1800 UTC.”

This discussion has ‘value added’ because it includes references to persistence, climatology and a degree of confidence.

2) “Thunderstorms will form over the mountains to southwest of SLC after 2000 UTC today, but due to a west flow aloft these thunderstorms have less than a 20 percent chance of impacting the terminal. The approach gates south of SLC will have a 70 percent chance of thunderstorms between 2000 – 2300 UTC.”

This discussion has ‘value added’ because it indicates that thunderstorms will be affecting the airspace of SLC and describes why they will not impact the terminal. This aids both FAA and airline dispatchers in their planning strategies.

3) “The confidence level of the ceiling remaining at or above BKN070 is 80 percent through 2000 UTC, but drops to 60 percent after 2000 UTC as showers move into the region.”

At SLC the difference between BKN060 and BKN070 is significant in that the number of aircraft allowed to land decreases by as much as 40 per hour when the ceiling drops from 7000 ft to 6000 ft. Expressing level of confidence about clouds remaining above or below the 7000 ft level is very beneficial to ATCT when conditions are marginal, especially during high volume periods.

Another consideration is the dissemination time of the aviation discussion. The Public AFD issuance time may not be the most opportune time for customers of the aviation discussion. For instance, the FAA’s Traffic Management Unit (TMU) at SLC has their evening briefing at 2315 UTC. Therefore, a discussion issued after 2315 UTC is ineffective for their planning purposes. This is an issue that each WFO should resolve via communication with their customers.

Summary

The advent of issuing an aviation discussion within the AFD enabled National Weather Service forecasters to overcome some of the inherent restrictions within the TAF format. The use of probabilities and confidence levels were a significant step forward in opening the channels of communication between the forecaster and their customers. However, due to the wide latitude given to the forecasters as to what should be covered in the aviation discussion the information that was being disseminated became too verbose and technical in some instances while over usage of probabilities made some discussions confusing to the customer. Consequently, a couple of customers (FAA ATCT and Southwest Airlines) were invited to collaborate with respect to the development of guidelines for the content of the aviation discussion. As a result, the content of the aviation discussion is now more effective and better aligned with user needs. While these content guidelines are specific to SLC terminal, the core of them could be used universally for the entire CONUS. Based on discussions between WFO SLC and local customers, such an implementation may better serve the wishes and needs of the airline dispatchers.

References

Western Region Headquarters-Meteorological Services Division-Western Region ROML's and Supplements: supp_WR_10-503_2005_draft update-1
http://ww2.wrh.noaa.gov/amd/ROMLfiles/ROMLindex.htm