Friends and Partners in Aviation Weather

Agenda for 2019 Spring Meeting

16 – 17 April in Washington, DC

Location NTSB Conference Center, 429 L'Enfant Plaza, SW, Washington, DC 20594

Tuesday, 16 April 2019

08:00 – 11:00 **Planning of 2019 FPAW Fall Meeting**

Leads: Matt Fronzak (MITRE) and Matthias Steiner (NCAR)

Discuss potential topics for the FPAW fall meeting in Las Vegas, NV and identify leads for session topics.

13:00 – 13:10 **Welcome**

Matt Fronzak (MITRE) and Matthias Steiner (NCAR)

13:10 – 13:30 **Keynote Comments**

Bruce Landsberg (NTSB Vice Chairman)

13:30 – 17:00 **Accounting for Forecast Uncertainty in Decision-Making**

Leads: Mike Robinson (MITRE), Colleen Reiche (Booz Allen Hamilton), Warren Qualley (Southwest Airlines) and Steve Abelman (American Airlines)

Panelists: Steve Abelman (American Airlines), Gina Eosco (Cherokee Nation Strategic Programs, supporting NOAAs Office of Weather and Air Quality), Kathy Gilbert (National Centers for Environmental Prediction), John Gordon (Airline Dispatchers Federation), Pat Murphy (FAA), Warren Qualley (Southwest Airlines), Eric Silverman (American Airlines), Darin Tietjen (Southwest Airlines), Steve Weygandt (NOAA Earth System Research Laboratory)

Accounting for uncertainty when using weather forecasts for air traffic decision support persists as a significant challenge. On the weather-side, forecasts continue to improve and advancements in probabilistic and ensemble weather prediction have been notable. On the side of air traffic applications, decision-makers and processes have become more aware of impact risks and potential contingencies that must be considered when constraints are driven by uncertain forecasts. Advances on both sides, however, still occur only sporadically, can often be anecdotal, and are typically difficult to codify and methodologically advance as alternative, data-driven solutions. As a result, both sides still typically drive weather-impacted aviation operations towards deterministic solutions targeting one predicted outcome (whose uncertainty is largely unknown). In turn, these outcomes are inconsistent, as decision-makers again try to fall back on operator experience or recall of outcomes of recent events (which may not be representative of current scenarios).

Managing weather uncertainty is a challenge because the limitations are not simply or wholly meteorological or related to air traffic management. Challenges exists on all fronts and may most notably reside with complexities from social or behavioral science, or may be due to the lack of advanced automation that may be better suited to accommodate weather uncertainty guidance. Even if that automation existed, however, questions persist as to how best to utilize it in a human-machine teaming environment.

This panel will examine the needs, opportunities, and challenges associated with incorporating better weather forecast uncertainty management as part of aviation decision-making. The objective of this FPAW session is to discuss and consider what steps can be taken to help evolve today's operational decision-making paradigm towards a framework where weather uncertainty management is objective and explicitly in the forefront.

Wednesday, 17 April 2019

08:00 – 08:15 **2019 Weather Prize and Special Recognition Awards**

Lead: Tim Miner/APA representing the Consortium of Aviation Weather Users (A4A, ADF, ALPA, AOPA, APA, NATCA, NBAA, RCC)

Join us in congratulating the highly-deserving scientist/engineer recipient of the 2019 Weather Prize.

Additionally, join us in specially recognizing and congratulating an individual whose efforts enabled many of the scientific/engineering advances in aviation weather to make their way to the users.

08:15 – 12:00 **Next Generation of HEMS Weather Tool**

Leads: Rex Alexander (Five-Alpha & Vertical Flight Society) and Bruce Carmichael (NCAR Retired)

Panelists: Rex Alexander (Vertical Flight Society / U.S. Helicopter Safety Team [USHST]), Stephen Darr (Dynamic Aerospace), Jenny Colavito (FAA NextGen Weather Research Branch), Gary Pokodner (FAA Weather Technology in the Cockpit Program), Cliff Johnson (FAA William J. Hughes Technical Center), Stephanie Avey (NOAA NWS Aviation Weather Center), Dan Vietor (NOAA/NWS Aviation Weather Center)

Originally created in 2006 to improve weather decision-making for pilots in the Helicopter EMS community, over the past 12 years the HEMS Weather Tool has become a critical weather decision-making asset that most HEMS pilots are now unwilling to fly without. This graphically-based weather reporting tool has since been embraced by numerous other disciplines in the aviation community operating at low altitudes between the surface and 5,000 feet. General aviation, drone/UAS, agriculture, balloon, glider, ultralight and fire-fighting communities are among the disciplines that have discovered and now embrace this phenomenal weather reporting tool every day.

The panel will discuss future potential innovations being contemplated for this game changing, weather reporting tool. Discussion topics will include the following:

- Development of a smart phone application
- Incorporation of aircraft-based observations into the tool
- Enhanced icing reporting
- In-cockpit weather reporting and integration
- Urban area turbulence and wind reporting
- Increased reporting station integration
- Enhanced surface reporting capabilities
- Recommendations for a name change

The intended, ultimate outcome of this session is the development of a proposal supported by FPAW for tool development, presentation of the proposal to potential sponsors, and FPAW advocacy for this effort.

13:00 – 17:00 **Improving ATM Data-Driven Decision-Making when Convective Weather Impacts High Congestion Airspace (e.g., Northeast Corridor and Atlanta)**

Leads: Jim Evans, Tom Reynolds, and Joe Venuti (MIT/LL), John Kosak (NBAA)

Panelists: Mark Hopkins (Delta Air Lines), John Kosak and Ernie Stellings (NBAA), David Bieger (NOAA NWS MIC – FAA ATCSCC), Darin Tietjen and Warren Qualley (Southwest Airlines), Pat Murphy (FAA Aviation Weather Division), Rocky Stone (United Airlines), *Jennifer Ross and Kevin Bannwolf (FAA ATCSCC, PERTI program) (tentative)*

Reducing the impact of convective weather in high congestion airspace is an ongoing concern. A number of convective weather forecasts, decision support tools and procedures are in use, but flight delays, cancellations, and diversions continue. This panel will discuss contemporary practices for convective weather ATM decision-making in two high congestion locations (the Northeast Corridor and Atlanta) in order to compare and contrast current practices, information sources and opportunities for improvements.

Discussion topics include:

1. Which convective forecast products are being used in practice to determine which Traffic Management Initiatives (TMIs) (e.g., GDPs, AFPs, ground stops, rerouting) will be used at various lead times?
2. How are the TMI parameters (e.g., start time, rate time profile) being determined?
3. What information is used to make tactical adjustments (e.g., 0-2 hour lead times)?
4. How might the FAA's Plan, Execute, Review, Train, Improve (PERTI) initiative improve decision-making?
   Specific cases of convective impacts on Atlanta and the Northeast Corridor will be used as the framework for the above topics
5. What do the panel members see as the highest payoff areas for further reducing "avoidable delay" associated with convective weather impacts at Atlanta and the Northeast Corridor? Examples of options may include:
   - Improving choice of TMIs
   - Improving decision support from CWSUs at ARTCCs (and, perhaps some TRACONs)

- Better data-driven decision support:
  - Forecast reliability (e.g., forecast confidence metrics, focused meteorologist support)
  - Explicit translation of weather forecasts into capacity impact forecasts
  - Post-event analysis to identify best practices and missed opportunities
- Improved training for key decision-makers (e.g., TMU, area managers)

The intended outcomes of this session are a snapshot of which of the many available convective weather forecasts are being used operationally and how decision-making could be improved.