

**Friends/Partners Aviation Weather – Vision Meeting  
27 June 2007 Washington DC, FAA Headquarters  
Segment 1 - Weather Concept of Operations  
Questions & Industry Responses  
Compile by Tom Fahey**

Industry Representatives who contributed to the responses prior to meeting:

Frank Alexander, NWA  
Lorne Cass, NWA

Rick Curtis, SWA  
Bill Leber, NWA

Tom Fahey, NWA  
Warren Qualley, Consultant

Meeting attendees whose comments have been attempted to be summarized and are recorded in the Question #5 "Has the weather working group missed a critical concept?" section below.

Agam Sinha, Mitre  
Matt Fronzak, Delta

Bill Phaneuf, ALPA  
Rick Curtis, SWA

Bob Gillen, ENSCO

**Question 1:** Do you agree that direct and timely integration of weather information into decision support tools is needed to address NextGen goals? If not, what are your concerns and/or alternative approaches? If so, should it have the highest priority for NextGen weather related tasks?

*Yes, provided there are capabilities for individual operators to define and apply weather avoidance thresholds based on their specifications. Weather conditions that need to be avoided vary by operator and even the capabilities of an individual operator are not constant for all operations.*

*Yes, it should have a very high priority. The main challenge will be to try and estimate where automation will be at various benchmarks, and the mixes of information be dealt with (human, automated, private sourced and public sources). If a primary component of NextGen is based on weather integration then these need to be dealt with now - versus later.*

**Question 2:** The NextGen weather working group proposes a "four-dimensional weather information dissemination system (the so-called 4D cube) as the way forward to solving NextGen's weather enabling capabilities. Do you see any operational and technical issues that concern you with this approach?

*Yes, 1. Operational Quality control of information in the system.*

*e.g.: Human-in-the-Loop or Human-over-the loop realtime monitoring of info accuracy/reasonableness.*

*2. Organizational structure for user trouble reports, immediate prioritization and timely resolution.*

*3. Redundancy, outage procedures, fallback solutions.*

*4. Industry capability to equip to utilize the info*

*All four of these issues are especially important and more specifically need secondary and tertiary redundancies, alternative routings for data, fallback solutions, and full redundancy/procedures between the two World Area Forecast Centers (WAFC)s, something we don't have today.*

*Agree - role of human is crucial in terms of involvement. System needs to be structured around what is possible around a blend of human and automated produced products - with each having a significant role.*

*Need to identify the process for repair when the forecast is incorrect. What can be done? How fast can new data be integrated?*

*Need some sort of forecast verification (almost on a real-time basis) on both local and national scales. This will provide users immediate feedback, and also post operation analysis intended for improvement purposes. Only problem here is that we should be viewing the future not as having weather products, rather feeding weather data into decision support systems; it may be incumbent on users of the output to monitor the products from these systems since they will likely vary between users. Hope that you understand what I'm trying to say.*

*When will industry start to have access to System Wide Information Management (SWIM) &/or the Joint Environmental Toolkit (JET)?*

**Question 3:** The NextGen weather working group calls for an initial operational capability (with limited capability/scope) of the 4D cube as early as 2012, and a full up capability supporting a highly automated capability around 2018-2020. Will you be ready to take advantage of this capability? If not, what are the issues that would prevent your being ready?

1. *Need Specification of methods to access before the industry can answer this question completely.*
  - a. *Need to know what will be provided (specs as mentioned above). Need to know data formats, transmission techniques, intended usage etc.*
  - b. *Is the technology now or will it be available for use in the specified timeframe?*
  - c. *Have a means by which to exchange the data been established?*
  - d. *The ever popular - How much will it cost the operator?*
  - e. *Who will be the "service provider" and what is their status of meeting the proposed dates?*  
*The industry is very interested to hear the answer to "e. There is an assumption currently among some industry reps that it will be NextGen Network Enabled Weather (NNEW), i.e. the government.*

**Question 4:** The NextGen weather concept of operations calls for the routine use of probabilistic, rather than deterministic information, and promotes machine to machine communication as the primary means of passing weather information within the government air traffic management system. Do you agree?

*Yes probabilistic is the way to go, but this is changing culture. What will be done to facilitate this change by Flight Crews and Dispatchers? Also are there any regulation implications relating to this change?*

*Another Industry rep at the meeting on the 27<sup>th</sup> stated the assumption that the entire Federal Air Regulations (FAR)s would need to be revised to acknowledge the new way of operating in an NGATS environment. The FARs issue alone poses many questions.*

*Absolutely agree. The interesting thing in my mind is how the output will be displayed and used. It CANNOT "look like" weather data or it will inhibit a paradigm shift. All forecasts, probabilistic or not, must be embedded in a decision support system with the output providing answers and not a forecast to be interpreted.*

*Machine to machine communication is the only answer (in my mind anyway), However the information should be based on a blend of human and automated input. Sorry kind of a theme going on here regarding need for human involvement.*

**Question 5:** Has the weather working group missed a critical concept?

*Critical Concepts Missed: Contributions prior to the meeting:*

*Organizational Structure for an on going process of Weekly, Monthly, Quarterly, Annual Evaluation, Updating & Improvements of info in the 4D wx info database and the communications infrastructure.*

*Metrics for benchmarking current capability and affect on NAS. On going Metrics for evaluating costs vs. benefits of newly added capabilities.*

*Also addressed these issues in Question 2 and Question 4. Believe the greatest critical concept concerning any change in weather support for NAS decision involves a tremendous culture change for everyone involved (Pilots, Dispatchers, FAA etc.). Roles will need clear definition. Change management into new processes and procedures will be the hardest part of the entire effort – my opinion!*

*Has the Weather IPT considered the integration issues associated with inputting the weather data into the "master computer system" that will output the 4D trajectories that are being considered?*

*Has additional wx obs data been prioritized for inclusion in SWIM/JET & 2012 initial capability? Specifically there is interest in: 1 minute ASOS data; Braking Action/Runway conditions; Realtime reports of Liquid Water Equivalent of snowfall & freezing precipitation; Windshear alerts; and RVR, in addition to ITWS/CIWS data.*

**Question 5:** Has the weather working group missed a critical concept? (Continued)

*Critical Concepts Missed: Partial Summary of Discussion from 27<sup>th</sup> Meeting Segment #1 Comments*

- a. *It is realized that the above 4 questions were not intended to be an all inclusive list of issues addresses by the JPDO Wx group. With that being said, the questions did not address Observations and did not address Research & Development.*
- b. *Summary of points made by Agam Sinha, Mitre at 27 June meeting*
  - b.1. *What is operationally useful info?*
  - b.2. *When is binary type weather info needed, yes/no?*
  - b.3. *When is probabilistic weather info sufficient or preferred?*
  - b.4. *We currently do not have the "functional requirements" for the 4D weather cube. We do not have info regarding the level of detail required for the 4D weather cube info. How will we finalize these spec as well as dissemination and integration specs?*
- c. *Summary of points made by Matt Fonzak, Delta @27Jun meeting w/ some editorial expansion by compiler:*
  - c.1. *Research & Development: develop capability to operate thru all weather conditions "wx permeability".*
  - c.2. *Research & Development: the NGATS needs to be designed in a way that the system can both anticipate and react rapidly*
  - c.3. *Research & Development: define and implement Human-Over-the-Loop capability.*
  - c.4. *Budgets & Funding: Industry's experience has been that when budgets get tight meteorology is an area that is often the 1st target for budget cuts. How will we be able to answer questions regarding, what is the financial impact of investments in integration of weather info into 4D cube database and what is the financial impact of investments in integration of weather info into air traffic management decision making tools.*
  - c.5. *FAA Flight Standards Oversight: How will the new Concept of Operations be incorporated into the existing Federal Air Regulations (FAR)s?*
  - c.6. *Integration: Are we in the meteorology community just "talking to ourselves"? How can we design future meetings to support collaboration between meteorologists, air traffic management reps and those responsible for integration of weather info into air traffic management decision making tools?*

*SPECIFIC OPEN ISSUE: While it was acknowledged that there were some reps., the question posed was: Will the next Friends/Partners Aviation Weather Vision Meeting include more representatives responsible for air traffic management and reps responsible for integration of weather info into air traffic management decision making tools?*

- d. *Point made by Bill Phaneuf, ALPA at 27 June meeting (c.1.) w/ some editorial expansion/license by the recorder/compiler (c.2.):*
  - d.1. *Currently and for the foreseeable future, Pilots will continue to be responsible as the final decision makers for operation of individual aircraft in the tactical time frame. Pilots, when en route, do not currently have access to the best weather info, although it is available to ground based decision makers. Weather datalink needs to be emphasized for the NGATS and in the Weather Concept of Operation.*
  - d.2. *The Concept of Operations needs to address the issue of providing motivation for individuals and companies operating in the NAS to invest in NGATS capabilities.*
- e. *Point made by Rick Curtis, SWA @27Jun meeting w/ some editorial expansion by compiler:*
  - e.1. *Where will the line be drawn on info to be included and info not to be included in the 4D cube? Airlines have info needs much broader than can ever be anticipated by a single data base, even if it is a virtual database. Internal airline specific issues driven by weather such as: "will the employees be able to make it to the airport to report to work?" or "will the passengers be able to make it to the airport?" are just two examples. Rick attempted to illustrate the extremely broad scope of info required by a large airline. And also attempted to identify the fact that it does not seem feasible that a "single authoritative source" for weather info would be able to address all weather info needs for weather related decision making by an airline.*
  - e.2. *It was attempted to characterize this concept as lack of capability of a "single authoritative source" for weather info to address the "strategic decision" needs of an airline.*
- f. *Point made by Bob Gillen, ENSCO*
  - f.1. *Attempted to support the issue Rick Curtis raised by noting the role ENSCO meteorologists play at United Airlines by supplying tailored meteorological info to support United's strategic decision making processes.*

*SPECIFIC OPEN ISSUE: Will the "single authoritative source" for weather info be designed to address airline specific strategic decision making processes?*