

Requesting Team/Organization: Weather Working Group (WWG)

Co-Lead Names: Mark Andrews and Steve Brown

Brief Description of the Team's Task

The vision of the WWG is to enable aviation system users to mitigate the negative impact of weather on aviation safety and capacity by developing and implementing scientifically advanced and operationally tailored weather products that are fully integrated into appropriate aviation decision-making processes. The WWG works across agencies, industry stakeholders, and other Working Groups to achieve results in the area of weather/weather operations such as real-time weather information sharing initiatives, observation and forecast networking, weather services, and weather-related standards and policies. By facilitating the construction of an aviation weather data sharing and integration into future systems strategy, a common data protocol schema may be adopted without impacting the unique information management requirements of each participating agency.

Approximately 70 percent of all delays which passengers have undergone are attributed to poor weather conditions. In general aviation, weather is a contributing or causal factor in 87 percent of all accidents. In the long-term plans for NextGen, JPDO and its partner departments and agencies have identified the need for a paradigm shift in dealing with weather-related issues. As described in the Concept of Operations, NextGen will provide access to enhanced weather capabilities based on an integrated, consistent "common weather picture," a forecast system providing probabilistic weather information and direct integration of weather information into operational decision-making.

The development of a Four-Dimensional Weather Data Cube (4-D Wx Data Cube) is one focus of the WWG. Although the concept was invented decades ago, technology advancements such as broadband communications and computing capability will help facilitate its implementation. The 4-D Wx Data Cube is designed to incorporate multiple observation and forecast systems to generate a series of probabilities for various weather occurrences. The weather

information, which will include the traditional information of latitude, longitude, and altitude, and a fourth dimension of time, will directly feed into automated decision-making algorithms within the operational system. After the weather information is collected from global sources and automatically processed, it is then efficiently and effectively shared among aviation system users (such as airline operators and pilots). The impacts of weather will be provided in comprehensible terminologies based on individual user preferences. In result, pilots, controllers, airline operators, and even passengers will know how the system is being impacted by weather at the present moment or some time in the future. The 4-D Wx Data Cube is scheduled to be initially operational in 2013, with increasing annual deliverables.

Expected Products

As the Joint Planning and Development Office moves from a planning to the facilitation of agency/industry implementation phase, the working groups supporting that implementation must adapt and change to accommodate the new phase. It is expected that funded research and the beginnings of implementation efforts will challenge and refine the weather concepts built during the planning phase. Many of the planning documents (concept of operations, agency architectures, and the integrated work plan, for instance) will need to be modified and updated as research results are achieved. At the same time, working group members will work with government and industry representatives to insure a synchronized development and implementation plan is developed and executed.

Over the past few months the WWG has transitioned into a new organizational structure. A 4-D Wx Data Cube team, composed of a leadership team, an "Initial Operational Capability (IOC)" team, an "Environmental Data" team, and an "information technology/enterprise services" team is forming. In addition, a "test and demonstration" and "weather integration" standing committee is also forming. The WWG is soliciting industry representatives for all of these teams.

Required Expertise and Skill Mix

- a. 4-D Cube Initial Operational Capability (IOC) team
 - Knowledge of successful distribution networks and their transition into operations (non-domain specific)

- Knowledge of and ability to distinguish between techniques to populate, store and disseminate non-domain specific information within and between virtual databases
- Knowledge of existing government and industry weather distribution systems

b. 4-D Cube Information Technology/Enterprise Services (ITES) team

- Knowledge of net centric concepts, standards, and infrastructure needed or be willing to learn fast with a general background in IT related issues.
- Expertise with respect to Service Oriented Architectures (SOA) and SOA processes.
- Knowledge of existing government and industry weather distribution systems
 - Understanding of the transformational nature of NextGen as described in NextGen Conops, Integrated Work Plan, and Enterprise Architecture.

c. 4-D Cube Environmental Information Team

- Knowledge of numerical weather prediction techniques (modeling, physics, ensembles, other)
- Knowledge of and ability to distinguish between standards, catalogs, and protocols used in successful industry networks (non-domain specific)
- Knowledge of existing government and industry weather distribution systems helpful but not a pre-requisite

d. Weather Working Group Demonstration/Test Team

- Knowledge of existing government and industry demonstrations on weather systems
- Knowledge of existing weather/ATM integration studies and demonstrations
- Knowledge on testing needed to certify systems for fielding

e. Air Navigation Services Weather Integration Standing Committee (representing the WWG)

- Knowledge of automated decision support systems
- Understanding of risk-based decision making theory

- Knowledge of weather impacts on operational aviation decision making processes
- Understanding of the transformational nature of NextGen as described in the NextGen concept of operations, Integrated Work Plan, and Enterprise Architecture

Expected Time Commitment of Participant – duration and level of effort

Duration: Participants are asked to commit to serve a minimum term of one year

Level of Effort: Members participate in a day-long workgroup meeting on a recurring basis which can be attended in person or via telephone conference. Additional meetings and teleconferences may be scheduled on an as needed basis.

Members also support broader WWG activities, if and as needed.

Members will need to spend time outside of meetings reading e-mails and reviewing and commenting on various NextGen reports and studies generated by JPDO and/or its partner agencies. Additionally members will commit time to preparing materials for telecons/meetings or JPDO deliverables.

The expectation is that members will spend approximately 20% of their time supporting ANS activities.

Additional Information

Required attributes of WWG members:

- Able to share their expertise on stakeholder perspectives (includes direct access to key leaders in represented constituency)
- Able to contribute to and evaluate technical studies and reports and provide timely and helpful feedback when required/requested
- Able to transcend parochial interest of represented constituency and take a national/international perspective
- Willing to challenge/test own beliefs and assumptions
- Commitment to maintain privacy of work products until release by the WWG/JPDO
- Able to attend or be present for most team meetings

More information on the Next Generation Air Transportation System Joint Planning and Development Office can be found at <http://www.jpdo.aero>