NGATS Network-Enabled Weather 2012 Initial Capability

Ken Leonard

"Friends/Partners in Aviation Weather"
Vision Forum
July 13, 2006

WxIPT IC Objective

- Achieve an end-to-end transformation of a subset of weather information provision to a subset of users via network-centric operation
  - End-to-end: observations, forecasting, dissemination, and integration into end user decision systems or mitigation techniques
  - Maximize network enabled operations
  - Implies completion of training, policy, and systems engineering support needs

2012 IC Criteria

- Addresses/resolves an important technical issue, requirement, or objective
- Demonstrates a critical functional capability
- Addresses a valued operational need
- Available resource/low cost
- Utilizes a current system in a network centric environment
- Integrates diverse agencies and users
- Lays foundation Initial Capability

Movement to 2012 IC

- Recognize that we must utilize certain capabilities from today's infrastructure, e.g.,
  - Operational sensors
  - Data transmission (e.g. FTI)
- Build the IC system incrementally, across agencies, pulling in infrastructure pieces
- Modify existing program tech refresh strategies to facilitate implementation of the NEO vision
- Adopt flexible industry-based NEO standards
- Provide appropriate resources
  - New money
  - Reprogrammed existing money

Weather IPT Challenges

- Multi-agency (NOAA, DoD, etc.) cooperation and commitment to a common NEO weather implementation
- Resource and Budget support – Now thru 2012
- Acquisition strategy shift for agency systems
- Public/private sector roles definition

WxIPT IC Target Set

- Key weather elements
  - Convective weather
  - Restrictions to vision
  - Icing
  - Turbulence
- Key decision-makers (civilian and DoD)
  - Traffic managers
  - Dispatchers
  - Pilots
- Adjust as we learn more
- New opportunities may emerge

Convective Weather

- Storm intensity
- Lightning
- Echo tops
- Hazard tops
- Precipitation type
- Precipitation rate
- Strong surface wind

Restrictions to Vision

- 3-D probabilistic analysis and forecasts of cloud structure
- Includes bases, tops, cloud character, layering, fractional coverage, etc.

Icing

- Probability and severity of icing
- Freezing level
- Freezing rain and drizzle at surface and aloft
- Liquid water content, temperature and drop size metric
  - For use in aircraft-specific decision support systems as an experimental product

Turbulence

- All known turbulence sources
  - Convective turbulence, both in and near cloud
  - Mountain wave turbulence
  - Clear Air Turbulence
- Probabilistic forecasts of moderate and severe areas

User Decision Support

- Integration Team IC candidate capabilities
  - Integrate and/or display forecast (convective and other available, and probabilistic where available) and weather impact into Flight Operations Center systems
  - Integrate Probabilistic SFO Ceiling/Visibility Forecast into Planned Departure Times for SFO Bound Aircraft
  - Integrate and/or display forecast (convective and other available, and probabilistic where available) and weather impact into cockpit systems (e.g., Electronic Flight Bag, Capstone, …)

Issues

- Convert forecasts into aviation impacts
- System requirements for user needs
- Consolidated storm forecasting system
- Determine role for human input in forecast process
- Use integrated forecast data in cockpit systems
- Network in place with core services (e.g. metadata catalogue, registries, etc.)
- DoD Global Information Grid interface

Next Steps

- IC version 1.0 late September
- Coordinate IC with
  - Other JPDO IPTs
  - Agencies and programs
  - Institute
- Use System Wide Information Management weather demonstration 2007/2008
  - Resolve technical issues
  - Testing and prototyping
  - Demonstration of capabilities for stakeholders