NextGen
Next Generation Air Transportation System

NextGen Weather - An FAA Overview

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NextGen is More than FAA

Congress:
NextGen is “a systems engineering, management, and regulatory challenge as complex as any the nation has ever faced.”

• Multi-agency partnership
• FAA has the implementation lead
• For weather, working with DOC, DoD, industry & academia
NextGen: Improving Service Delivery

**Today’s NAS**

- Ground-based Navigation and Surveillance
- Air Traffic Control Communications By Voice
- Disconnected Information Systems
- Air Traffic “Control”
- Fragmented Weather Forecasting
- Airport Operations Limited By Visibility Conditions
- Forensic Safety Systems

**NextGen**

- Satellite-based Navigation and Surveillance
- Clearance Trajectories and Routine Information Sent Digitally
- Information More Readily Accessible
- Air Traffic “Management”
- Forecasts Embedded into Decisions
- Operations Continue Into Lower Visibility Conditions
- Prognostic Safety Systems
“Solution Sets” & NextGen Programs

Solution Set Portfolios

- Initiate Trajectory Based Operations
- Increase Flexibility in the Terminal Environment
- Increase Arrivals/Departures at High Density Airports
- Improve Collaborative ATM
- Reduce Weather Impact (RWI)
- Increase Safety, Security, and Environmental Performance
- Transform Facilities

Transformational Programs

- Automatic Dependent Surveillance – Broadcast (ADS-B)
- Collaborative Air Traffic Management Technologies (CATM-T)
- System-Wide Information Management (SWIM)
- Data Communications (Data Comm)
- NAS Voice System (NVS)
- NextGen Network-Enabled Weather (NNEW)

Solution Sets provide portfolios of NextGen capabilities...
Solution Set Managers Team

Roles and Responsibilities

Solution Set Managers Team (AJP-31)
- Develop NextGen Portfolio Work Plan
- Develop NextGen Portfolio Performance Report (Technical, and Capability Level)
- Coordination of Project Level Agreements (PLA) (Technical Content)
- Coordination of Resource Planning Documents (RPDs) (Technical Content)
- Support NAS Engineering Architecture Roadmap Update Activities
- Lead NextGen Budget Planning and Optimization
- Participate on Working Groups and Special Committees
  - FAA/NASA Research Technology Transition Teams (RTT’s)
  - JPDO Weather Working Group
  - ICAO Working Group
- Provide information to, e.g., OMB, GAO, IG
- Outreach activities (i.e., REDAC, RTCA, Technical Women’s Organization, etc.)
NextGen Integration and Implementation Spans the Full Life Cycle

Solution Set Activities

Initial Investment Decision/
Investment Analysis Readiness
Decision

Final
Investment
Decision

Initial
Operating
Capability

Implementing
Known Solutions

Acquisition and Implementation Activities

Increasing Degree of Maturity

Degree of Uncertainty

Foundational
Research

Applied Research/System Development

Prototyping, Demos and other
Risk Reduction Activities

Operations
NextGen Weather
The Challenge

- **Weather accounts for:**
  - 70% of delays*
  - 21% of accidents**

- **Demand exceeds capacity in weather**
- **Weather information is not well integrated into NAS operational decision making**
  - Lack of common weather information decision makers
    - Inconsistent and efficient access and formats for weather data
  - Insufficient accuracy and resolution of weather information
  - Weather information not currently usable by decision support tools

- **Support transition from legacy systems to NextGen**

*OpsNet 2007
NextGen: Improvements in All Phases of Flight

Weather Goal
To provide advanced weather information (e.g., 0-8h convective forecasts) to enable improved collaborative planning and efficient utilization of resources (e.g., airspace, airports) to optimize operations & reduce the impact of weather from gate to gate.
NextGen Weather
Contributions to Solutions Sets

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<th>Air Traffic Operations</th>
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| **Trajectory Based Operations** | • Improved forecast accuracy and access provide better flow management, assessment of alternative flows  
• Access to weather information indexed to aircraft and weather type |
| **High Density Arr/Dep Terminals and Airports** | • Improved forecast of airport/runway weather impacts  
• Improved situational awareness for dynamic separation management (e.g. wake vortex information) |
| **Flexible Terminals and Airports** | • Provide weather indexed to aircraft and weather type  
• Improved forecast accuracy and access provide better flow management, assessment of alternative airport flows |
| **Collaborative ATM** | • Provide authoritative source of weather information with improved forecasts and current conditions to plan individual flights or flows  
• Identifies flight specific reroutes for weather related congestion and assess the impact of those planned re-routes |
| **Reduce Weather Impacts** | • Increase timeliness and accuracy of tailored weather information to facilitate proactive Air Traffic Management and air carrier avoidance actions. |
| **Safety, Security and Environment** | |
| **Transform Facilities** | • Provide weather indexed to aircraft and weather type  
• Improved forecast of airport/runway weather impacts |
NextGen Weather Portfolio And Coordination

NNEW

Aviation Weather Group (AJP-68)

RWI-Weather Forecast Improvements

Aviation Weather Services (AJW-47)

RWI- Weather Observation Improvements

Systems Operations Services (AJR)

NextGen Solution Sets