



Friends of Aviation Weather CCFP for 2003

- **Rapid Prototyping and Their Consequences**
- **The Cornerstone for Traffic Flow Management**
- **CCFP is collaboration, forecast, application**
- **The CCFP/02 Experience**
- **The CCFP/03 Requirements**
- **Where are we going with this?**

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The CCFP/2002 Experience

- **A CCFP Task Force of CDM**
 - **FAA, NWS, Employee collaboration.**
- **2-hour cycle for 2/4/6 hour thunderstorm forecasts.**
- **Operational Feedback Reports.**
- **Online Technical Training.**
- **TMU refresher training by CWSUs.**
- **Familiarization OJT for AWC Forecasters at ATCSCC.**
- **Monthly telcon and evaluation**
- **Ongoing Evaluation of skill and participation.**
- **Participants: FAA, NWS, airlines & ATA, GA & NBAA, NATCA, NAATS, NWSEO, FSL, MIT/LLabs.**
- **Results: *mixed***
 - **“open chatroom” bombed**
 - **users interpret forecasts like a radar map**
 - **no concept of operations**

The CCFP/03 Requirements - primary

1. **CCFP Baseline/02**
 - 1.1 **Focus on 4/6 hour lead time**
2. **Collaboration**
 - 2.1 **Airline, GA, and CWSU Producers; ATCSCC WxUnit**
 - 2.2 **Canadian participation**
3. **The Forecast (NWS AWC)**
 - 3.1 **Producers Input to AWC**
 - 3.2 **AWC Initiative**
 - 3.2 **Textbox for physical reasoning**
4. **Application (FAA ATCSCC and Workgroup on WeaAps)**
 - 4.2 **Concept of Use**
 - 4.3 **Best practices**

The CCFP/03 Requirements - supporting

5. **Training (CR Workgroup on Training)**
 - 5.1 **Training Syllabus**
 - 5.2 **Train-the-trainor**
 - 5.3 **Computer-Based-Training (CBI)**
6. **Forecast Verification (*FSL*)**
 - 6.1 **parameters: skill; precision; *reliability*.**
 - 6.2 **objectives: location; intensity; coverage; confidence**
7. **Evaluation and Feedback (daily; ATCSCC WxUnit)**
 - 7.1 **Operational Feedback: consequences**
8. **Evaluation (monthly and seasonal)**
(CR Workgroup on WeaAps; AvMet; FSL; MIT/LLabs)

Where are we going with this?

- **Suggestions from the users: make better forecasts**
(accuracy, precision, consistency)
 - **Response:** *If we knew how to do it, we wouldn't be talking about it!*
- **Suggestions from the producers: make probability forecasts**
(real probability forecasts; verify them)
 - **Response:** *What are we supposed to do with that?*
- **Next step: in the *gap* between forecasting and applications**
 - Develop a concept for operational use
 - Develop “best practices”
 - Write procedures
- **By referendum: Change the name!**



OEP V5.0 Update

(EW1; EW-2; ER-2)

Quadrant: En Route Severe Weather

EW-1: Provide Better Hazardous Weather Information

EW-2: Respond Effectively to Hazardous Weather

Quadrant: En Route Congestion

ER-2: Collaborate to Manage Congestion

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En Route Severe Weather

EW-1: Provide Better Hazardous Weather Information

Major Changes:

- Broader scope (EW-1.1) to include 3 priorities identified by the Aviation Weather Mission Need Statement
- Additional strategies (2 of 3) to address applications and utility of weather forecasts (EW-1.2, 3, 4)
- Renewed emphasis on operational change; replaced objectives for EW-1.3 and 1.4

En Route Severe Weather

EW-1: Provide Better Hazardous Weather Information

Vision for 2003-05:

- **Aviation Weather Mission Needs Statement (2002)**
 - Initiated by ARQ; Approved by JSC
 - Priorities: Thunderstorms; Turbulence and Icing
- **National Research Council Workshop (June 2002):**
 - Forecasting Accuracy for the Traffic Flow Management
- **Second Workshop on ATM and DSS (July 2002)**
 - sponsored by AUA-1 and MITRE, NCAR, and MIT/Lincoln Labs
- **Collaborative Decision Making Workgroups**
 - participants from industry, government, employee Unions
- **Aviation Weather Technology Transfer (AWTT) Board**
 - a disciplined process for technology transfer
- **Build on success of OEP/EW-1 and -2**
 - List of accomplishments

ACCOMPLISHMENTS

- **ADDS** - Aviation Digital Data Service on the Web
- **RTVS** - Real Time Verification System to evaluate skill
- **CCFP** - Collaborative Convective Forecast Product to predict thunderstorms for TFM
- **NCWF** - National Convective Weather Forecast to predict thunderstorms for ATC on a national scale.
- **CIWS** (from ITWS) - Corridor Integrated Weather System to predict thunderstorms in ZNY, ZOB and ZAU
- **RUC** - Rapid Update Cycle forecast model for short-range weather forecasting.
- **WARP** -Weather And Radar Processor upgrades shows NEXRAD radar on the DSR controller screen.
- **CIP** - Current Icing Potential to identify hazardous icing conditions with vertical discrimination

Problem Statement:

- **Discrepancy** between weather observations and the forecast (accuracy; precision; intensity and reliability)
- **Deficiency** in the application of weather information to traffic flow management.

Strategy for Operational Change:

- Increase the skill
- Mitigate the impacts
- Manage the reaction

STRUCTURE for EW-1

EW-1.1: Improve the detection and forecast of hazardous weather

- **Thunderstorms** (Thunderstorm Impact Mitigation)
- **Turbulence** (Nonconvective Turbulence and Winds Aloft Optimization)
- **Icing** (In-flight Icing Impact Mitigation)

EW-1.2: Ensure Dissemination and Display

EW-1.3: Commit to Applications and Training

EW-1.4: Integrate Weather Forecasts into Decision Support Systems (DSSs)

How will the information be used by Users?

This program is driven by changes in operational practice that will reduce the forecast discrepancies and deficiencies in the use of weather forecasts for traffic management decisions. The 2nd and 3rd strategies address *utility*:

- **mitigate the impacts** (ensure dissemination and display, and commit to applications and training);
- **manage the reaction** (integrate weather information into DSSs)

Users will apply weather information through:

- develop “best practices” for using wx info for TFM
- integrate the use of overlapping wx forecasts
- develop operational feedback and post-analysis
- simultaneous display of weather and air traffic
- training in both value and limits of wx products
- development of Decision Support Systems.

What success can we expect in 2003, and at the end?

2003

- Users will receive training and guidelines for using 3 new forecasting products for thunderstorms: CCFP; NCWF; CIWS. Plans will be written and training initiated.
- The first intercomparison test of WRF with the RUC weather forecast model will document new capabilities for aviation forecasting. The Research Forecast (WRF) model was developed by a consortium from NOAA/FSL; NCAR; NWS/NCEP; USAF/AWA; CAPS/University of Oklahoma; and others.
- *A Concept of Use, Best Practices and Training Plan* will be developed for every new weather product (thunderstorms; icing; turbulence) under consideration by the AWTT Board
- *A Benefits Assessment* of CIWS will be completed, including an evaluation of the delay reduction achieved by using a 2hr forecast of thunderstorms as input to an Air Traffic Decision Support System (DSS).

End State

- Weather products will be integrated into automated decision support systems (e.g., RAPT).
- Greater reliance on objective weather forecasts from high-resolution weather models (e.g., WRF)

EW-2: En Route Severe Weather- Respond Effectively to Hazardous Weather

- TM Tools that are used collaboratively have been moved to ER-2
- Decision Display Systems (DSSs) that are driven by weather hazards appear in EW-1.4