WARP (Weather And Radar Processor)
Modernizing the FAA’s Weather Processing Support
of Air Traffic Control Operations Nationwide
We are ready to take WARP to the next level

The Weather And Radar Processor (WARP) is an automated processing and display system that acquires, processes, and consumes Next Generation Weather Radar (NEXRAD) data to air traffic personnel at 21 Air Route Traffic Control Centers (ARTCC) and the Air Traffic Control System Command Center (ATCSCC). Two other systems are installed at the FAA’s William J. Hughes Technical Center in Atlantic City, NJ, for development testing.

The WARP system was declared fully operational in December 2002 and has played an instrumental role in supporting FAA goals of safety and efficiency. The current WARP system was developed in three stages. Stage 0 was an early deployment of a commercial off-the-shelf system that replaced and improved the functionality of the Meteorologist Weather Processor (MWP). Stage 0 was in service from 1997 to 2001. Stages 1 and 2, developed and implemented concurrently, were the core of the project. The deployment of these stages is complete and the system is in service today.

The WARP Maintenance and Sustainment Services (WAMS II) contract provides complete hardware and software maintenance of the system, as well as a 24/7 user help desk. The Radar Acquisition and Mosaic Processor (RAMP) subsystem directly connects to the WSR-88D radars in the vicinity of the ARTCC. The system then collects the radar data, creates regional radar mosaics, and distributes the radar data and mosaics to other WARP systems. The composite reflectivity and layered data and mosaics are continuously delivered every 25 seconds to the display system terminals.

WARP also receives high-resolution GOES satellite imagery, as well as gridded binarigraphical, and alphanumeric meteorological data. All this information is stored in databases by the WARP for retrieval and analysis by the Center Weather Service Unit meteorologists on their triple-headed workstation. The meteorologists prepare regular briefings for center personnel and send products of interest to the area supervisors via WARP briefing terminals.

A separate WARP workstation, designated especially for the ARTCC Monitor and Control Center (AMCC), continuously monitors the status of health of the WARP system and provides alerts when any problems are detected.

The FAA’s Federal Weather Telecommunication Gateway (FWTG) subsystem of WARP connects to the National Weather Service (NWS) Telecommunications Gateway and receives the RUC, NAM, and GFS gridded weather forecast data. The FWTG located at the ATCSCC then passes this data to the Integrated Terminal Weather System (ITWS) and to the ARTCC Weather Systems.

The Weather Information Network Server (WINS), another subsystem of WARP, is located in each of the ARTCCs. The WINS is the centralized weather data server for the NAS. All data that is available on WARP is also available on WINS. This includes alphanumeric text messages, meteorological model outputs (gridded weather forecast data), weather advisories (SIGMETS for icing or turbulence), minute-by-minute weather observations, lightning data, and the real-time and national radar mosaics. WARP currently provides data to IFRAM, ATOP, SDOT, and CAPER systems within the NAS. The WARP-WINS systems provide a flexible architecture that allows WARP to unify face and share data with virtually all FAA systems and users. With the full integration of WINS, all NAS systems have the same weather data, significantly enhancing collaborative decision making and safety of flight.

WARP Tech Refresh Provides Path Towards NextGen

WARP has completed a major technical upgrade that provides the FAA with a robust, flexible, new Service-Oriented Architecture (SOA) capabilities, and an excellent opportunity for future growth. As the FAA prepares for implementation of NextGen Network Enabled Weather (NNEW), WARP’s current and future capabilities should be considered effective and efficient method for implementing NextGen weather goals.

The FAA has the unique opportunity to leverage past and current WARP investments for using WARP as the backbone of NNEW. Adding capabilities to WARP to achieve NextGen goals in the short term is the most cost-effective and efficient solution to developing an entirely new weather processing system or implementing NextGen prototypes. Since WARP has already been declared fully operational by the FAA, future system enhancements and changes can be implemented quickly and saving valuable FAA budget resources.

Merging terminal weather services and forecasting capabilities into WARP would help consolidate systems within the NAS, while providing NAS systems and users with the most timely, accurate, and consistent weather information available. Utilizing the WARP system with forecast algorithms, existing weather systems’ capabilities, and proven prototypes will allow WARP to transition to the NextGen Weather Processor (NWPP).

WARP completed a significant technical refresh in July 2009. This refresh increased the capacity of WARP to receive additional products, and added the ability to distribute data to a larger user community by its decision support tools that were unable to access WARP’s extensive databases of weather information. Utilizing WARP’s SOA services will provide great flexibility and is the most efficient approach for weather data delivery to the NAS or other government agencies.

The assimilation of WARP data by decision support tools increases the effectiveness of weather information, optimizing NextGen operations. Products received or developed by WARP can be instantly delivered throughout the NAS to support the FAA goal of collaborative and dynamic NAS decision making. WARP is an aggregator to weather source data that can facilitate a cost effective, opportunistic, transitional, and evolutionary approach for connecting weather sources to SWAM, decision support systems, and end users.

The WARP program and its stakeholders maintain a proven and proud track record within the FAA and look forward to helping bring the FAA NextGen vision to reality.

Harris is proud of its long relationship with the Federal Aviation Administration, and we are committed to providing the highest levels of service to help ensure the safety of our nation’s air travelers.

Helping the FAA find the best routes around weather
WARP provides Air Traffic Control specialists at the 21 Air Route Traffic Control Centers (ARTCCs) and the Air Traffic Control System Command Center (ATCSCC) an extensive Maintenance Help Desk. Harris personnel in partnership with the FAA can connect to each of the WARP systems via a remote modem. Using this connection, Harris personnel can monitor the site’s performance and often can identify a system malfunction before the site realizes there is a problem. Therefore, problems can be worked before they become a problem for the site. The WSOC is staffed 24 hours a day, 7 days a week with trained and experienced engineers eager to remedy any problem that might arise.