



En Route Automation Modernization (ERAM)

En Route Automation Modernization (ERAM) will replace the existing en route air traffic control automation system. ERAM will replace the software/hardware in the en route Host Computer System and the Direct Access Radar Channel (DARC). In concert with other en route programs, ERAM will modernize the en route environment and infrastructure to provide a modular, expandable and supportable system. ERAM will provide existing functionality and new capabilities needed to support the National Airspace System (NAS) architecture evolution, Air Traffic Services operational requirements and information security requirements. The major elements ERAM will address are: safety logic in the backup system, flexible routing, utilization of surveillance information, and the ability to integrate new capabilities without costly redesigns.

Safety Alerts

When Host is unavailable, DARC serves as the primary system and denies controllers a reliable means to provide standard en route separation of traffic. DARC does not provide controllers with flight plan tracks, mode-C intruders, minimum safe altitude warning or look-ahead projections of possible conflict alerts. To ensure no loss of safety, controllers are forced to throttle back on NAS capacity by restricting the number of aircraft they can manage during Host outages. With ERAM, primary and new back-up systems will have exactly the same capabilities and new functions to provide end-to-end flight routing across sector/Air Route Traffic Control Center (ARTCC) boundaries. In the event a primary automation processor becomes unavailable, ERAM will ensure no degradation of safety or loss of efficiency.

Flexible Routing

To accommodate greater numbers of flights with no erosion of safety, the Federal Aviation Administration (FAA) intends to add new capabilities for flexible routing of aircraft, greater use of military special use airspace for commercial aviation, and incorporation of automatic dependent surveillance-broadcast (ADS-B) information. Existing Host/DARC automation cannot provide these capabilities due to its rigid software architecture. The new ERAM architecture will provide existing NAS capabilities and add new capabilities needed to efficiently handle traffic growth through 2020, including flight data



processing up to 200 miles beyond the limits of the primary airspace. ERAM will remove structural limitations to implementing real-time routing to handle unplanned events such as severe weather or surges in traffic. In addition, ERAM provides the ability to expand surveillance and flight data processing coverage to include adjacent center's airspace in the event of a catastrophic failure or natural disaster.

Surveillance

Currently, en route traffic is restricted to en route separation standards, partially due to designed accuracy limits and infrequently updated aircraft position data available from today's en route radars. ERAM will provide flight data processing for an area 2000 x 2000 nautical miles that also increases tracking accuracy. The ability to use digital radars and ADS-B will provide improved position data on active aircraft. ERAM will allow a fused display using available ADS-B and additional radar data to provide better information to controllers and pilots. ERAM will accept, recognize and process aircraft target information from the latest radar technology so en route can operate using terminal radar coverage in congested areas. Enhanced surveillance capability should allow reduced en route separation creating greater capacity and more efficiency in the NAS.

Deploying New Functionality

The current NAS software is 30-years old and its obsolete languages (JOVIAL and Basic Assembly Language) serve as a major barrier to upgrades and efficient software maintenance. The current Host software is limiting the assignment of transponder codes, and portions of the system are constraining troubleshooting, data reduction, and maintenance response. Host software revisions are limited to an 18-month cycle because of diminishing experience and increasing

complexity for each successive release. Integrated software adaptation in Host requires much time-consuming testing at each facility prior to fielding any change. Host outages create a drop in facility traffic capability resulting in higher costs for impacted operators. Due to these limitations, new functionality is being deployed through stand-alone tools that interface with the aging Host. The existing Host/DARC will not allow controllers to add, modify and delete new flight plan fields and messages not currently defined in NAS flight plans and flight plan messages. Although agreements exist with Canada and Mexico that will streamline the flow of international traffic across flight information regions, International Civil Aeronautical Organization (ICAO) flight plans remain largely a manual process until ERAM is deployed. Conversion to a modernized open-systems automation architecture will ensure a more supportable en route system into the future.

For more information, log on to:
www.faa.gov/aua/enroute

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