

FAA William J. Hughes Technical Center

ATC Engineering and Test Division, ACT-200 Display System Replacement (DSR)

The Display System Replacement (DSR) modernizes the Federal Aviation Administration's Air Traffic Control (ATC) computer equipment in the 20 Air Route Traffic Control Centers (ARTCCs). DSR provides high reliability and availability through hardware redundancy, fault tolerant software design, and primary and backup networks.

DSR replaces the current monochrome 19-inch circular Plan View Displays (PVDs) with 20- by 20-inch-square color displays. It also replaces the Data and Assistant Consoles (M1) and the display channels with new technology equipment. DSR provides redundant hardware and network paths with modern Reduced Instruction Set Computer (RISC) processing technology for improved speed, reliability, and capacity. In addition to replacing aging equipment, the DSR architecture serves as a platform for future ATC system upgrades. The DSR System Support Complex (DSSC) includes the capability to support DSR software maintenance.

KEY ACCOMPLISHMENTS

- **Formal Hardware Factory Testing**
Hardware testing included both the Design Verification Test (DVT) and the First Article Test (FAT) for the DSR Console.
- **Technical Center Installation and Integration (I&I) Testing**
Over 300 console simulators and 80 DSR consoles were involved in the testing.



- **Development, Test, and Evaluation (DT&E) Subsystem Level Testing**
These tests verified the functionality and performance of each subsystem to verify specifications.
- **DT&E System Testing**
These tests verified the function and performance of the complete systems.
- **Technical Center Acceptance Testing**
These tests used a single set of test procedures demonstrating the overall capabilities of the DSR/DSSC. Acceptance testing is also planned for future system regression tests.
- **Formal and OT&E Testing**
These tests exercised the DSR and DSSC using field personnel in realistic situations and configurations to determine their level of operational acceptability and to identify any operational problems.

Efficiency
System



- **Formal Installation and Integration (I&I) Testing at Seattle ARTCC**

These tests demonstrated that all DSR hardware was correctly installed and that all components have the appropriate communication paths.

- **FAA System Testing**

These tests verified that fixes and changes that were applied to the operational software were correctly integrated and that there were no adverse effects on other functions.

DSR supports a sector-by-sector transition strategy that permits a gradual transition from the current PVDs in the old control room to the DSR consoles in the new control room. Modifications to the current National Airspace System (NAS) software will enable the host computer system to send all output data to PVDs only, to PVDs and DSR consoles, or to DSR consoles only. Selection of these three modes is under site adaptation control. Transition software also provides a capability to select a single source of input data, either a PVD or a DSR console, for each active sector. This capability allows each individual primary ATC sector to

be identified as monitoring on the DSR console and controlling on the PVD.

A similar transition capability is implemented for the EDARC system. Hardware modification to the EDARC System Status Control cabinet provides the switching control for output data to PVDs only, to both PVDs and DSR consoles, or to DSR consoles only.

Airways Facilities (AF) training will be accomplished at the FAA Academy, Mike Monroney Aeronautical Center, Oklahoma City, OK. Training is organized into three courses: system management, hardware maintenance, and software maintenance. A self-study course is also offered in computer operations.

For more information on the ATC Engineering and Test Division, Display System Replacement (DSR), contact:

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