

Naval Aviation Depots

Modernizing two locations to improve performance and increase storage capacity.



Naval Aviation Depots Cherry Point, NC & Jacksonville, FL

About the Naval Aviation Depots:

The US Navy uses the Cherry Point and Jacksonville depots for automated storage, kitting and retrieval of airplane parts.

Cherry Point utilized a 4-aisle Supreme mini-load ASRS with conveyor and workstations and a 2-aisle Interlake unit-load ASRS with conveyor and workstations. Two AGV's were used to deliver pallets to and from the ASRS and the production floor.

The Jacksonville depot consisted of a 3-aisle Supreme mini-load ASRS with conveyor and workstations and a 1-aisle Munck unit-load stacker with conveyor and workstation.

The conveyor systems at both sites facilitated load movement to and from the workstations. All transactions were directed through the ASKARS host computer system, which is located in Cherry Point. Instructions from the host were sent to the stackers and conveyor equipment controllers, which in turn directed loads to the workstations and reported completed functions back to the host. The host sent a display to the workstation terminal. When the work is completed, the workstation operator reports the task complete to the host, which instructs the system controller to return the container (pan) or pallet to its assigned stacker.

Business Challenges:

- ▶ The mini-loads at both sites had proprietary controls, were in poor mechanical condition and the operating speeds had been reduced to half their original design.
- ▶ Both sites needed more storage capacity.
- ▶ Conveyor controls were obsolete and difficult to support.
- ▶ Cherry Point's Interlake controls were obsolete and inflexible and the AGVs were in poor mechanical condition and could no longer be supported.

Highlights of the Project:

The Navy's primary goal for both retrofits was to improve stacker crane performance & reliability and to increase storage capacity. The goal was met by replacing outdated controls and cranes with state-of-the-art equipment and software. Retrotech performed the upgrades "live," so customer inconvenience and downtime is kept to a minimum.

Retrotech replaced the mini-load stackers at both locations with new Munck Autech mini-load stackers and replaced the unit-load stacker in Jacksonville with a new Munck Autech unit-load stacker. Rockell Allen-Bradley Panel-View Operator MMI Terminals were installed in each mini-load aisle and onboard each unit-load for stacker PLC mode operation and diagnostics. Maintenance friendly, Retrotech software was developed for the Panelview terminals that provided English text messages & simplified input pushbuttons and readouts for executing rapid diagnostic and repair procedures.

Retrotech replaced floor rail with new thermite-welded rail and grouted all aisles.

User-friendly Pentium PCs with an SCO UNIX operating system (SSC) supplied equipment monitor and control functions (for mini-loads, unit-loads, and conveyor) and interfaced with the Host Tandem System to automatically receive & queue store/retrieve transactions and return completion status information upon a successful putaway.

Retrotech chose NDC Automation to provide two new AGVs for Cherry Point, to operate as standalones using a floor-wire guidance system. New conveyors (in a horseshoe pattern at the end of each stacker) and an Allen-Bradley SLC-5/03 conveyor control system were added to assure reliability

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CASE STUDY

and traceability of all parts pans. A new SICK ISD 220 infrared communications system was installed to replace the outdated modem links and allow high-speed diagnostics and updates to occur between the stackers and new PC equipment control.

To provide additional storage capacity, Retrotech relocated four Munck unit-load stackers with rack system, from Pensacola, FL to Cherry Point and installed in-rack fire protection. These relocated stackers were retrofit with new Allen-Bradley (A-B) SLC-5/03s, A-B 1395 DC drive controllers, DC motors, encoder based vertical and horizontal drive positioning systems, and new shuttle motors and drive.

Results:

- ▶ Dramatically improved flexibility, performance and reliability to operate at high volume with minimal downtime.
- ▶ The new stacker and conveyor PLCs improved the ASRS throughput and enabled maintenance staff the quick diagnostics needed to support the parts operation.
- ▶ The PCs were equipped with graphical, user-friendly screens to enable operators to perform transactions and diagnostic functions easily. Fully mapped layouts of the ASRS, including interactive, near real-time display of pans and unit-loads in motion, provided operations and maintenance staff information for operating and maintaining the modernized ASRS. Multiple sessions, with multiple drop down menus, allowed operators to view current state material handling conditions as well as status conditions of I/O on the stackers and conveyor. Remote session capability allowed personnel not in the area to view conditions from other areas of the campus.
- ▶ Components are non-proprietary and parts are easily accessible "off-the-shelf", providing the Naval Depots with the ability to support and maintain the upgrade independently.

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