

DRIVING BAGGAGE HANDLING EFFICIENCY

Partnership leads to industry benefits

As airports seek technological improvement and operational efficiencies in baggage handling systems, NORD DRIVESYSTEMS, a global leader in drive technology for mechanical and electronic solutions, plays an integral role in delivering high-performance baggage handling systems to some of the world's busiest airports. NORD is represented in 98 countries and its customers benefit from a global production, assembly service, and sales network.

MIA Upgrades BHS

In 2017, Miami International Airport (MIA) upgraded the Checked Baggage Inspection Systems (CBIS) for the South and Central Terminals. Under a contract with Jervis B. Webb (Daifuku) as installer and integrator, the entire Central Terminal system was replaced and the South Terminal system was modified and enhanced with newer technology. According to Adonis Schmidt, project engineer with Daifuku, a primary goal of the project was to improve throughput over the old system to keep up with projected passenger growth at the southern Florida airport.

Daifuku was heavily involved in redesigning portions of the system as well as phasing revision following changes in MIA's design team, Schmidt reports. The firm also provided months of pre-construction design assistance prior to executing the \$102 million project, which included the installation of 12 CTX 9800 explosives detection (EDS) machines and more than 1,200 conventional belt conveyors. In partnership with Daifuku, conveyor systems were outfitted with helical bevel gearmotors, motor-mounted SK200 series inverters (variable frequency drive control units). The more than nine miles of new and rerouted conveyor belts at MIA allow

TSA to scan and transport some 7,000 bags per hour, effectively doubling baggage capacity.

MIA's baggage handling system upgrade included baggage handling conveyor technology as well as a checked baggage reconciliation area (CBRA), which was designed with 102 mobile inspection tables (MIT). MITs use magnetic tape guided vehicles to deliver baggage to Transportation Security Administration (TSA) agents, which greatly reduces the need for TSA to lift and carry bags, reducing injury potential and increasing efficiency, says Schmidt. "It's an automatic guided vehicle that delivers the bags that need further inspection to TSA directly," he explains. TSA searches the bag and then the MIT takes the bag to the appropriate conveyor for re-introduction back into the baggage handling system.

Schmidt says he and his team are pleased with the performance of the NORD components as well as the partnership with the sales and project engineering teams on the extensive MIA project. "We worked closely with NORD during the design phase so the technicians could analyze the conveyor system to ensure we had optimized selections," he notes.

Daifuku presented NORD with the conveyor system specifications, including conveyor lengths and motor horsepower, while NORD technicians analyzed the data and presented the properly sized VFD and braking resistor to ensure that the combination was capable of handling the system's maximum weight. "The willingness and ability of NORD to work closely with us as far as getting the technical specifications and overcoming any challenges was critical," he adds.

DTW Re-control

At Detroit Wayne Metropolitan Airport (DTW), Daifuku lead a full system re-control (requested by Delta Air Lines) of the existing baggage handling system, which Schmidt says was technologically outdated. In parallel with the existing system, Daifuku installed and integrated new NORD VFDs and motors to optimize 600 conveyors in DTW's McNamara Terminal. This recapitalization required installation to occur at night so that operations could carry on during daytime hours at the busy facility.

Daifuku established a test loop at the NORD facility in Wisconsin to prove out the DTW network through detailed testing. "Kudos to NORD for working with us to set up that test loop and working closely with us to make sure everything went smoothly," Schmidt remarks.

James Chandler, key markets manager at NORD, points out that the many conveyor belts are equipped with high-efficiency right angle or inline gear motors, many with distributed drive controls. The integrated electro-mechanical drive solution equipped with quick connectors allows for preassembly at Daifuku's assembly shop, which minimized assembly and field wiring costs. Additionally, this preassembly saved on installation time and commissioning the system.

According to Schmidt, Daifuku purchased NORD ethernet internet protocol (EIP) modules and networked all new VFD units to collect additional information beneficial to the maintenance and operations group to potentially identify motors/VFDs in need of replacement.

"We were able to make use of the NORD ethernet internet protocol for networking the VFDs together, which enabled us to gather information from the VFD on what kind of performance it was at," Schmidt explains. "That is definitely a nice feature."

Another stand-out feature of the NORD VFDs, Schmidt notes, is the hand-held NORDAC ACCESS BT programming tool that plugs into each VFD. This allows installers to copy and paste parameters from one VFD to another, which facilitates the overall installation and commissioning of the system. "Having a hand-held device to plug directly into the VFD to change parameters speeds up the process considerably," he relates.

For DTW's project, Daifuku also built out new control room operations and installed a Sym3 graphics package, which allows operators to view live bags in the system and better route baggage around system failures, replaced existing control technology with fully redundant Allen-Bradley controls and replaced existing clutch/brake pusher unit controls designed to allow maintenance to easily and quickly change out malfunctioning units and minimize system downtime.

SEA Multi-Phase Improvement

At Seattle International Airport (SEA), a baggage optimization project was designed to upgrade and reconfigure an aging conveyor system in the outbound baggage handling system that had become inefficient as operations increased at the western

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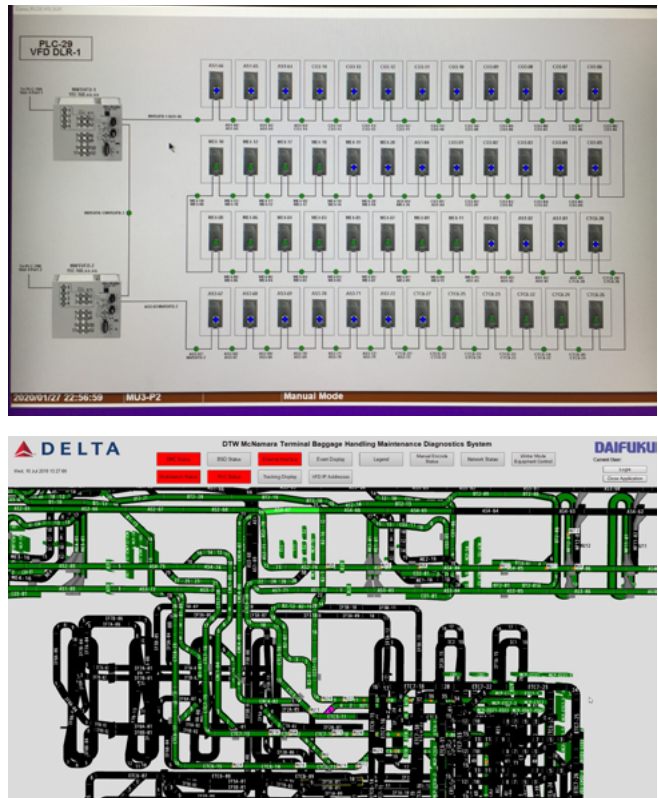
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United States airport. When complete, all outbound bags will be transported to a single, centralized screening area. Bags that are collected at any ticket counter or curbside can be sorted to any section of the airport.

Phase 1 of the project, completed in May 2020, includes 600 NORD high efficiency C-FACE helical inline and helical bevel right-angle gear motors, which features a compact, space-saving design, quiet operation, high axial and radial load bearing capacity and torsionally rigid, high-strength cast iron housing, to run the ten miles of redundant conveyor track.

As Phase 2 moves forward at SEA, the entire project plan calls for a total of 4,000 drives. According to Chandler, these complete systems consolidate the six separate systems previously used to drive these conveyors. Additionally, Schmidt notes that NORD motors were ordered and delivered with pre-wired connectors to mate with the plug and cable concept of the controllers.

Innovation Commitment

As part of Daifuku's commitment to continuous improvement, and in concert with its industry-leading partners, the company has created an Innovation Center at its lower Michigan headquarters which houses a variety of baggage handling systems to showcase the technology it can provide to customers, Schmidt says. NORD motor-VFD combinations will play a role in the Innovation Center, based on Daifuku's relationship and past experience with them. The Innovation Center is slated to be operational mid-2021.

