ACROSS
AIST Visits the Panama Canal to See Large-Scale Material Handling Up Close

For AIST’s 30 Technology Committees, an attractive element of participating in meetings is the plant tour. Members of AIST’s committees are provided countless opportunities to visit not only steel mills around the globe, but auto manufacturers, shipbuilding companies, foundries and world-class research facilities.

But the Material Handling Technology Committee (MHTC) took it a step further, not only in distance traveled but in scale. On 16–17 October 2019, the MHTC met in tropical Panama City, where it had the opportunity of a lifetime to visit the Panama Canal.

As far as material handling goes, it doesn’t get much better than this.

Early on the morning of 17 October, 12 delegates boarded the Panama Canal Railway for a 90-minute ride from Panama City to Colón. The group spent the morning touring the Manzanillo International Terminal (MIT), a transshipment terminal located adjacent to the Colón Free Zone.

The land on which MIT sits was originally a U.S. Naval base. Following the Torrijos-Carter Treaties of 1977, the land reverted back to Panama.
It was then used as a storage facility and distribution center for vehicles in the 1980s, and to avoid all the costs and logistics that came with moving cars to and from nearby Cristobal, a roll-on/roll-off (RORO) berth was built on-site. In August 1993, Stevedoring Services of America (now SSA Marine) arrived and began construction and operation of a container terminal.

Over the years, SSA Marine, through MIT, has invested more than
US$800 million in upgrades to the original facility, including new berths, cranes, computer control systems and continuous updates. Today MIT is the premier container transshipment facility on the Atlantic coast for ships arriving to and transiting the Panama Canal. MIT has more than 1,200 employees, many of whom have been with the company since day one. It is one of the largest business investments in the Colón area, providing jobs and vocational education to thousands of direct and indirect employees.

The facility occupies more than 500,000 m² and has a storage capacity of 37,000 twenty-foot equivalent units (TEUs). On premises is also a 15,000 m² container repair yard.

MIT has 11 post-Panamax and eight super post-Panamax cranes in its operation, and 24 rubber-tired gantry (RTG) cranes. More than 17.2 million containers move through the facility each year.

New over the last several years are MIT’s automatic stacking cranes, which are part of a larger automation project to streamline operational processes and increase efficiency. These automated cranes are electric, which allows for reduced CO₂ emissions. Equipped with lasers and cameras, they accurately...
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— Jesse DeSpain, Nucor Steel–Texas
position trucks and chassis under the crane and ensure precise landing of containers. The system automates reservations, planning and housekeeping; optimizes each crane’s work list; and features intelligent “set asides” when moving a container requires shifting nearby containers.

After a tour of the facility, the group had the opportunity to ride the four-person elevator up to the top of a post-Panamax crane for an amazing view of the expansive operations.

This, naturally, proved to be the highlight for the attendees.

“The amount of mobile equipment moving in the yard, the amount of cranes and crane lifts to load and unload these ships was mind-blowing,” said Jesse DeSpain of Nucor Steel–Texas. “The opportunity to tour the crane was certainly the overall highlight.”

Will Jones of Nucor Steel Tuscaloosa Inc. shared this sentiment. “I was amazed at the amount of cargo that they handle and the efficiency … It was the best business trip I’ve ever had.”

Once their feet were on the ground again, the group headed to the Panama Canal to visit the Aguas Clara Locks. There the delegates were able to see a liquefied natural gas carrier ship pass through the locks.

The Panama Canal is an 80-km route that connects the Pacific and Atlantic Oceans through the Isthmus of Panama. The concept for the canal can be traced as far back as the 1500s as a route between Spain and Peru. Over the next few centuries, dignitaries and philosophers all over the world brought forth ideas and plans for the canal.

The actual construction of the canal began in the 1880s by the French. However, their efforts were no match for the regional conditions. It soon became apparent that their targets were not being met and the French abandoned the project in 1889.

A second French company was created to save the project in 1894, but at the same
time, interest in the canal brewed in the U.S. The U.S. subsequently purchased the equipment from the French in 1904 and took over the construction efforts.

Since its original construction was completed in 1914, more than a million vessels have made the journey through the canal, a milestone that was reached in 2010. The canal has a workforce of about 10,000 and operates 24 hours a day, 365 days a year.

Consisting of artificial lakes and channels and several sets of locks, the canal connects 144 maritime routes across 1,700 ports in 160 countries.

Each lock consists of two lanes that raise vessels to the level of Gatun Lake and then lower them back to sea level. Water flows into the locks from nearby lakes simply by gravity, and the size of the locks determines the size of the ships that are able to pass through them.

A multi-billion-dollar expansion of the canal took place between 2007 and 2016 with the construction of two new lock complexes and an access channel that both increases the water supply and improves navigational channels.

The AIST group came away with new acquaintances, an unforgettable experience and new ideas to take back their facilities.

“On most any tour that you get to take with these committee meetings you can find something you
could implement at your facility,” DeSpain said.

“The Panama Canal tour was one of the best I’ve ever been on.”

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