

Case study of a Dairy Company: Automate to enhance efficiency

Industry Landscape:

The Indian dairy industry is the world's biggest milk maker, representing more than 13% of world's aggregate milk creation. The Indian Dairy industry is at a mammoth size of US\$ 70 billion. The extent of Indian dairy industry in both organized and un-organized areas is expected to double to \$140 billion by 2020, because of growing demand and rising disposable income. According to NDDB, the Indian dairy industry is going to experience high development rates with demand to reach 200 million tons by 2022 from 132 million tons in 2013.

The Opportunity:

Driven by this strong growth, the warehousing sector has gained more importance. However, this growth has thrown up plenty of challenges to the warehousing sector such as meeting the demand of high throughput due to enhanced demand from the market, dense storage to reduce the storage footprint and hence the power consumption for refrigeration and so on. Critical parameters like Inventory Management, Efficient & Accurate Operations in a chilled environment and Compliance to Food Safety Norms & quality standards have gained prime importance to enhance efficiency.

Realizing the above, one of the leading Dairy companies in India partnered with Godrej Efacec Automation & Robotics Ltd. (GEARL) to leverage automation solutions in their Manufacturing and Warehouse facilities. They wished to resolve the challenges they faced such as inventory management of around 4000 tonnes of cheese, dense storage in chilled environment, high throughput and compliance to applicable Food safety norms & quality standards.

GEARL conducted a comprehensive assessment of their warehouse needs encompassing vital factors like desired storage capacity, throughput, material flow and automation needs.

Key Challenges:

- Ensuring compatibility of bought out electrical and electronic components such as PLC's, sensors, etc. to work in 2 °C conditions
- Avoid condensation of electrical components like VFD's
- Compliance to applicable Food Safety norms and quality standards
- Real time inventory management through an inbuilt Warehouse Management System (WMS)

Solution Proposed:

After a thorough study and evaluation of multiple warehousing options, the company opted for the latest and best warehousing technology viz. AS/RS. A cold storage warehouse of 66m (L) x 17m (B) x 17.5m (H) was built to accommodate around 3000 pallet locations with a throughput of 50 pallets per hour with 2 dedicated stacker cranes.

The solution proposed an integration of the Manufacturing facility with the cold storage warehouse that was maintained at 5 °C. The manufacturing process is conducted on the 1st floor. The finished good i.e. processed cheese is placed in plastic crates and then palletized. This pallet is then passed through the Blast room which is basically cold air that is blasted at the product at 2 °C to bring the product from ambient temperature to 5 °C.

The pallet is then transferred via roller & chain conveyors to the Automated Storage & Retrieval System (AS/RS) in the cold storage warehouse that is maintained at 5 °C. The cold storage warehouse comprises of an AS/RS system which is a double deep storage system with 2 dedicated double mast stacker cranes to ensure maximum storage density. Once the pallet is stored in the AS/RS system, the inventory is updated.

When there is a call for a pallet, the AS/RS will retrieve the pallet based on FEFO (First Expiry First Out) basis and deliver the pallet to the ground floor. From here the pallet is then sent to the dispatch facility via the proposed conveying loop.

This entire process is controlled and monitored by the Warehouse Management System (WMS) software. The WMS is standalone software for warehouse operations, where all the functionalities are independent of other existing Enterprises software.

The basic functionalities of the WMS is to manage and control the equipment, location and inventory management enabling tracking of the material, generation of reports such as production reports, inventory reports and truck management reports and diagnosis and remote trouble shooting.

The WMS can interface with various data logging sensors i.e. RFID, Barcode readers, Barcode printers, weighing system etc., thus facilitating ease in integration with automated warehouse processes.

Scope of supply:

- Solution Conceptualization & Design
- 2 nos. dedicated double mast stacker crane
- Around 3000 Storage locations double deep system
- Metal pallets
- Other peripheral equipment's (Roller Conveyors, Chain Conveyors)
- Warehouse Management System
- Project Management
- Training & Manuals

Derived benefits:

The solution offers complete integration of production facility with the automated cold storage warehouse system through battery of conveyors. This in turn offers significant savings in operational cost and several other benefits to client, as under:

- Smaller warehouse footprint with high density storage
- Significant on-going energy savings required for refrigeration
- Guaranteed throughput meeting input-output demand of production facility & dispatch
- Seamless movement of material to and fro from warehouse to production facility due to integration of end-of-line with automated warehouse
- Minimal human intervention ensuring proper hygiene, reduction of damages and adherence to applicable Food safety norms and quality standards
- Warehouse Management Software (WMS) ensures inventory location accuracy
- Maintenance of FEFO (First-expiry, first-out) stock rotation
- As the automated equipment's does not involve use of batteries and hydraulics typical problems of spillage and battery leakages are taken care of

- The automated warehouse system is customized using key software processes to meet the client requirement and thereby the system is highly energy efficient.

Value delivered:

With the rapid growth of market for frozen food and beverages, the demand for refrigerated storage is growing rapidly. Company warehouses that are optimised through the use of automated storage and handling technologies will be better positioned to cost-effectively meet this demand, and deliver high levels of customer service.

ASRS systems provide competitive advantage by reducing storage space & labour touches, improving productivity, increasing service levels, compliance to food safety norms & quality standards and enhancing order processing flexibility, while delivering comprehensive tracking, visibility and operational management capabilities.