LG
WELDING &
SERVICES LTD

CASE STUDY

Chemical Distribution Project for Niras UK

OVERVIEW:

- Install new stainless steel chemical pipework
- Install new pumps, valves and instrumentation
- Pressure test the new system
- Install pipework insulation and cladding
- Remove redundant pipework, instrumentation and tanks

Chemical Distribution Project for Niras UK

Niras is a worldwide company that provide project management and consultancy services in a huge range of industries including the food and beverages, building and energy sectors. They were awarded a turnkey contract by Muller Milk and Ingredients (MMI) to install a new chemical distribution system at the MMI dairy site.

The old chemical distribution system required upgrading from a design point of view and the aged pipework, valves and pumps needed to be replaced. The system acted to supply cleaning and sterilisation chemicals to several CIP plants, washer units and pasteurisers.

L G have undertaken many projects over a number of years at the MMI site and have good knowledge of the pipework layout and processes. Given this experience, Niras commissioned L G with the mechanical element of the project which involved the fabrication and installation of chemical pipework routed to various appliances throughout the site. The installation involved pipes feeding user points in virtually every area of the site over multiple floor levels.

L G worked closely with Niras as well as the other contractors involved in the project including electricians and software engineers. Regular planning meetings were held with the project participants in order to discuss timeframes and general progress. L G's timeframes had to align with the other contractors so there were no obstructions or conflictions. The interface between contractors was also key in making sure that phases of the project were completed in the correct order so communication was vital to the success of the project.

L G's small team installed approximately 600 Metres of fully welded stainless steel chemical pipework. The chemicals being used were:

- **Caustic** - used as a cleaning agent in the CIP programs
- **Caustic (with additive)** - used as a cleaning agent for the balance tanks and pasteurisers
- **Peracetic Acid (PAA)** - used as an antimicrobial agent in the CIP programs
- **Nitric Acid** - used periodically to remove scale and provide further cleaning in the CIP programs

Given the harmful nature of the above chemicals, the project scope demanded that the pipework, valves and instruments would be fully welded rather than include unions or flanges that could potentially leak in the future. This meant that L G had to undertake positional welding in all areas of the site.

Only the pumps were connected with flanges and these were covered with bespoke guards c/w drip trays made and fitted by L G.

L G fabricated dosing modules for the pasteuriser balance tanks. The modules included valve arrangements for caustic, acid and water designed to dose the system at various stages of the CIP cleans. Pump modules were also made that included the necessary isolation valves, drain/flush arrangements and flow meters. L G installed stainless steel air supply pipes that allowed pneumatic instruments such as the diaphragm pumps and solenoid valves to be adequately supplied.

In addition, L G arranged for thermal insulation and cladding to be applied to the caustic lines that were located outside and exposed to potentially cold weather. L G's insulation suppliers also installed electrical heat tracing to the lines to further safeguard against freezing weather. Each line was labelled detailing the type of chemical being used as well as flow direction.

The installation project concluded with a hard changeover from the old system to the new one and was planned to be carried out over a single weekend. The main task for L G was to decouple the old pipework from the chemical supply tanks/user points and connect up the new distribution lines. In addition, the prefabricated pipework modules associated with the multiple chemical delivery pumps and instrumentation were also to be connected.

Once all the pipe connections had been made, L G carried out hydraulic pressure testing on the new pipe installation. Each chemical line was pressurised for several hours to ensure that they could hold a pressure that exceeded the output capability of the diaphragm pumps. The results were recorded in the project manager's report and showed that there was no loss of pressure therefore no leaks.

The new system as a whole was successfully installed and commenced operation on the Monday following the changeover weekend. L G played a key role in the success of the project not only by carrying out the general installation works, but by being a constant presence on site and a point of contact for Niras and other contractors. L G was in regular contact with the project designer feeding back requested information that assisted him with his calculations as well as discussing pipework configuration options etc.

Finally, once the system had been online for several weeks, Niras commissioned L G with a strip-out project that involved the complete removal of the old pipework, brackets, instrumentation, tanks etc. L G carried out the works over several weeks working closely with the MMI team to ensure that production and site operatives were unaffected.

The chemical distribution project at MMI is a good example of multiple companies working together towards a common goal. The personnel involved in the project all showed high levels of commitment, enthusiasm and a genuine desire to provide MMI with a high quality installation. The aim to deliver high quality services with a positive attitude is a key part of the ethos of L G Welding & Services Limited.

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