

## Festo: Skills and needs analysis

In this third article in our exclusive series Gary Wyles addresses the importance of identifying skills and personal development needs so an automation project delivers the required business results

CONDUCTING A SKILLS and needs analysis will help avoid two common mistakes in an automation project. The first is over specification where your organisation ends up with machinery that costs too much and there might not be the skills internally to operate and maintain it.

The second is under specification where the promised outputs are not being achieved. Both are equally damaging.

Engaging employees in the design and specification of the machinery will lead to appropriate automation where the complexity of the machinery is compatible with the skills available. At Festo we use a simple four-step methodology to understand the needs and skills available called IDEA.

The first step is to identify the needs of the organisation. This process must include those at a senior level, those who will drive the project, and importantly those who will be participating in the project – including the machine builders and employees who will be operating the machinery once it is delivered and installed.

This stage identifies the business and personal needs of each group and highlights any training needs. For example, does the team have the necessary skills to operate the machinery? Are there the skills internally to maintain and repair the machinery in the long term?

By identifying these needs early on in the project, training can be incorporated at every stage. For example production

staff can work side by side with the machine builders to understand the equipment literally inside out.

The second step is to develop tools such as designing a project plan complete with project tools and timescales.

The next step is engagement, which we've already discussed in the first article.

The final step is to apply the skills and knowledge learnt through training and development. Employees return to the working environment and encounter reality. Research suggests that as much as 50% of acquired knowledge can be lost within a few weeks if there is no opportunity to use it.

Skills need to be applied and practiced as soon as possible. Even then new situations and



questions will arise. These can be handled through coaching, clinics and workshops so that the project is regularly measured against the defined KPIs.

Through correct skills and needs identification, employees are equipped to deliver the hoped for business benefits. There is also a strong personal benefit where the individual's confidence increases because of personal development and the application of new knowledge and skills.

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## Drive technology for cold stores

DEMANDS ARE HIGH for the drive technology used in cold stores. With temperatures as low as -30°C it must work flawlessly. Standard drives are rated down to 0°C, or at best -10°C. Therefore it can be seen there is the potential for failures unless special measures are taken.

As a specialist in drive and automation technology with strong experience in this area, Lenze has put together three standard packages where AC and servo geared motors are adapted for low temperature operation.

The primary products used for the automation of cold stores are geared motors. These are often found in large numbers on conveyor and elevator systems. Lenze offer the L-force range from 60W to 45kW with a wide range of options. In addition,

automated storage and retrieval systems will use servo-gear motors to achieve the dynamic travel profiles required.

Where the air temperature remains above zero and the humidity is below 85%, no drive modifications are needed. However condensation levels are often higher in the storage of vegetables, fruit and salads. The protection package introduced by Lenze includes additional coating of the motor windings, stainless output shafts, condensation drain holes, stainless nameplates and a two component paint finish.

Where servomotors are used without gearboxes the motor shaft is constructed in stainless steel. The use of encoder feedback is avoided, instead Lenze fit resolvers which are much more robust. Where brakes are needed, special surface

treatment such as hard chroming is applied. Permanent magnet brakes are powered at standstill so as to maintain a small amount of heating.

As the temperature falls for the storage of fish (-5°C), butter and meat (-12°C) the drive task actually becomes easier as there is no condensation. However care must be taken around doors where the air temperature can fluctuate and condensation becomes possible. Low temperature synthetic oil is used to ensure lubrication is maintained at all times.

The third Lenze drive package suits deep-freeze areas down to -30°C suitable for the storage of ice cream, bread and convenience foods. Low air humidity prevents icing but a number of measures are needed for the drives.

Roller bearings are filled with low temperature grease and gearboxes with synthetic lubricants. Servomotors cannot use blowers below -15°C, but resolvers are suitable. Motor starting torque needs careful consideration with an extra service factor up to +20%. Testing shouldn't be done at normal temperatures in order to prevent damage.

Operators of cold store and deep-freeze storages expect their drive technology to be maintenance and trouble free. However the severe operating conditions mean that standard drives are not suitable in many cases.

The Lenze approach brings together field experience with drive knowledge. Three product packages – "corrosion protection", "extended standard" and "deep-freeze" – bring solutions to the handling of all foods in cold storage.