Case Study

Scheduling at Hodgson Sealants

"We needed to understand our scheduling situation better—how the operations in our factory could be defined in a model so that we could calculate accurate delivery times and increase the utilisation of assets such as packing lines and operators. We needed to know what technology is available and suitable for application in a business like ours, but had found the process of identifying suitable systems to be both difficult and time-consuming.

The consultant provided by the e4C programme identified the type of scheduling system we would need and how it could be applied to the business. The prototype demonstrations highlighted various issues which we would otherwise not have identified easily. We will now be able to make an informed judgement on system applicability and cost-effectiveness."

Hodgson Sealants Ltd makes a wide range of sealant materials at its factory in Beverley, East Yorkshire. The product range comprises glazing putties, speciality sealing strips and cartridge-applied mastics and the company produces both its own brand and those of major retailers and distributors.

Like most manufacturers the company is increasing its produce range, whilst its customers demand ever more stringent delivery timescales. This is a very common situation for all manufacturers and it leads to more complex production planning and scheduling requirements. Currently this is a manual activity and the company needed to assess whether a cost-effective system could be applied to assist in the planning function. The project funded by e4C therefore involved defining the manufacturing process in scheduling terms, defining the requirements for a scheduling system and identifying other systems which may be needed in order for the scheduling system to operate successfully.

The Manufacturing Process

It was decided that the subject of the study would be the glazing putty plant, in which there are two fundamental stages. Firstly the components are mixed in a batch, which is then transferred to a packing line where a large variety of pack sizes needed to be accommodated. Labour availability was an important part of the calculation.

Scheduling Issues

Once the principal plant items and processing stages had been defined it was then possible to define the general requirements of a scheduling system which could calculate production and provide realistic completion times. The principal requirements which were identified include:

- The various mixers could process the range of products, but at different rates and with different batch sizes
- Changing between putty types required differing amounts of time for cleaning and engineering changes
- Times of operation of the various parts of the process varied; for instance some sections work from 8am to 5pm, others 6am to 8pm.
- Some final pack sizes could only be made on certain packing lines
- Labour availability needed to be taken into account in the scheduling calculation
- Material transfers throughout the process must be handled as discrete batches

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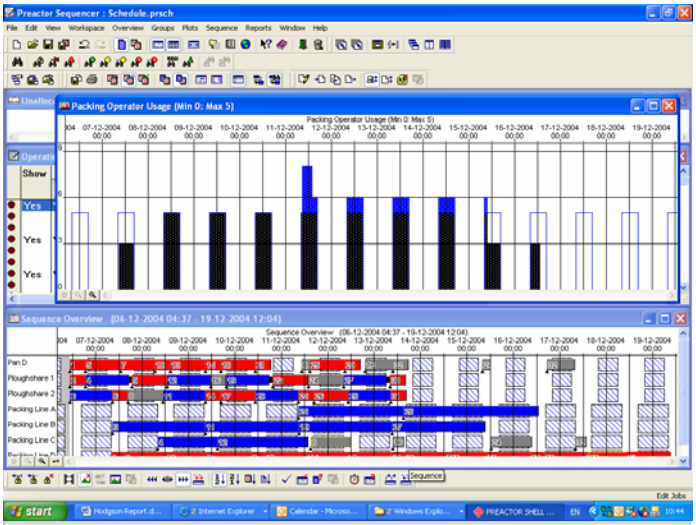
Once these (and other) requirements were identified a number of potential systems were evaluated to assess their applicability and cost-effectiveness. It was determined that a commercially available system, Preactor, could provide the functions required. This system is widely used in industry and is developed by the UK company Preactor International. A number of prototype model were therefore built as demonstrators, using a variety of Preactor types with varying functionality and cost. This has proved that the process can be modelled successfully and that issues such as varying shift times, throughput rates, machine-dependent labour requirements and so on can be addressed, and completion times of batches and bulk orders calculated, so that realistic delivery forecasts can be made. It is capable of producing the schedule virtually instantly, and can therefore be used frequently to calculate the consequences of changes such as lack of an operator, machine breakdown, order quantities and so on. It can also indicate the impact on the existing schedule of accepting an urgent order, and will identify which batches would be made late as a consequence.



An example Preactor display, showing plant operations and associated labour requirements and availability

The system can also be used to calculate the impact of modifying the factory - for instance by changing shift times, increasing machine throughput and so on.

Wider System Requirements

One of the characteristics of the business which was identified during the study is the wide range of types of orders which are received by the company. These vary from single orders for large quantities of specified packs, to single orders for one pack. This is also a common requirement in this type of factory, and it necessitates processing of individual sales orders into works orders which are appropriate for the batch sizes made on the machines. For instance, an order for a 25kg pack cannot be processed on a mixer which has a batch size of 700kg. It is therefore necessary to calculate works orders (which can be assigned to machines as demonstrated by Preactor) from sales orders, usually via an interposing stock keeping mechanism. Whilst Preactor can produce accurate schedules of works orders, if individual sales orders are to be to be tracked they must be assigned to a batch which can be scheduled by Preactor - a process often referred to as “aggregation”. As part of the e4C project therefore, a definition of the functionality required in order to close the link between sales and works orders has been prepared. The project has provided Hodgson Sealants’ management team with a clear definition of the requirements of a scheduling system which will handle the types of orders they process, together with an appreciation of the other functions which must be applied to sales orders so that they can successfully be scheduled.

The consultancy provider was AJM Consulting Services Ltd, www.ajm.co.uk

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