

Taking the systematic approach

It is no longer unusual for pharma companies to apply MRPII systems to their manufacturing processes. But how many of them can boast Class A status? Jacky Law reports on how Abbott Laboratories' manufacturing plant at Queenborough, UK, has been transformed

All quality improvement programmes follow a similar format. Whether they are aimed at management or manufacturing systems, they tend to measure every conceivable process, strive towards zero tolerance, and are all inclusive in the sense that everyone is encouraged to involve themselves in the wider scheme of things. They also have extraordinarily high failure rates, which is why the 700 staff at Abbott Laboratories' manufacturing plant in Queenborough, UK, are feeling so pleased with themselves.

For the past two months they have achieved so-called Class A status under the MRPII programme. If their efficiency measures continue into this, the third consecutive month, they can be officially certified, an honour that is said to elude 80% of companies that embark on the programme.

This accolade, if indeed it is attained, is reflected in various other achievements. Last year, as the plant was striving towards Class A, it won Abbott's Numero Uno award for best manufacturing performance. The company has 35 plants around the world, two others of which have also adopted MRPII systems, and this prize was proof of a tremendous turnaround. Neil Fenn, technical director of the Queenborough plant, explains that before the MRPII programme was implemented, some Abbott affiliates (the plant's main customers) were threatening to go elsewhere because the service was so bad. "The worst part was that we really thought we were doing a good job," he says. "We had no idea where we were going wrong." Now the plant's export orders have increased so significantly – from £98 million in 1996 to £250 million a year currently – that Abbott Laboratories UK was also awarded the Queen's Award for International Trade in 2001.

It must be said, however, that this 250% leap in export business was not entirely the result of greater efficiency. Another salient factor, and the main reason the programme was embarked upon, was that the UK affiliate was forced to change when Abbott's Spanish plant closed four years ago as part of a global exercise to rationalise manufacturing facilities. "Its capacity was transferred to the UK and this put a lot of pressure on our systems and management structure," says managing director of Abbott UK, Mark Haywood. "We had to find a new way of operating."

Two major decisions were made. One was to invest £6 million in upgrading the chemical plant which, based in four separate buildings, is one of Abbott's largest and most complex. It not only produces bulk APIs but has a separate inhalation anaesthetics factory, a multi-purpose unit that can produce any quantity of virtually every kind of chemical, and a more specialist facility to make the most potent ingredients.

But the more significant decision, according to Haywood, was the £300,000 the company paid for the consultancy and training costs associated with MRPII manufacturing. "The equipment we use is much the same," says Haywood. "The main difference we have made is to change our planning systems, computers and how we organise people. It is to do with better utilisation and execution, with things being more accurate, where they are supposed to be, and being done right the first time."

This is important when one considers the overall logistics. As well as the chemical complex there is a pharma plant which operates as a single business entity to formulate the chemicals into tablets and granules before packaging them up and despatching them to export markets in the US, the Middle East, Far East, parts of eastern Europe and Australia. The Queenborough plant as a whole manufactures no less than 1,000 different product lines, each with its own set of ingredients, patient leaflets and packs.

One of the first things that was put in place under MRPII was a master business plan to steer operations so all the ingredients for all the products arrive on time, are used on time, packaged on time and delivered on time. Haywood says the plant's ability to deliver has gone from within a month to within a week and will soon be down to within a day. It can also be more responsive in that, if asked to suddenly increase the production of a particular product, it can do so and say how long it will take with a high degree of accuracy. "The main change is in our credibility," says Haywood.

"The systems force you to look into the future and see problems that are going to occur months beforehand so that you can



Queenborough plant technical director Neil Fenn (left) discusses output figures with his quality assurance director Roger Draper.

take appropriate action.”

There are a series of decisions to be gone through at the monthly sales and operational planning (S&OP) meeting, for example, if demand on the plant is seen to fluctuate. Haywood explains that each affiliate is asked to place its orders 18 months in advance and that this is fixed for the first three months. Patterns in demand can be observed and unusual orders tend to stick out. If demand for a 250mg pill suddenly soars, for example, a decision must be taken as to whether to start production earlier, put on extra shifts, or look more deeply into the request. “We have three demand analysts assigned by geographical location,” says Haywood. “Their job is to ask if the demand is accurate, whether the customer is sure they want such a large order. It could be that Abbott has won a tender, in the Middle East say, and it is a one-off. Once the decisions are made, the master production schedulers plan the action.”

Such a complex production line relies heavily on everyone working together well. The MRPII programme, based around teams and measures, is designed to do just this. At Queenborough, the 700 staff are organised into work centres or departments that each tackle an aspect of the business such as demand management, planning and scheduling, sales and operations planning, and so on.

How well these teams perform shows up in the 22 performance indicators that the programme has specifically selected to provide early warnings of weaknesses within the manufacturing operation. These measures cover things like the accuracy of data being used, the quality of the planning to ensure the right amount of work is being scheduled, and how the plans are finally executed.

“A work centre might complain that their materials are not arriving on time, for example,” says Haywood. “It is important to be able to pinpoint why. The MRPII process has very precise measures to assess performance so we can see which area is slowing us down through a root cause analysis. Was the plan not carried out? Did the purchasers buy the wrong things? You can’t put something right until you know what is wrong.”

The trouble is that once the systems are in place, they have to be made to work by human beings who are inherently imperfect. The MRPII programme requires extraordinary input from the workforce to operate across all measures at the Class A standard of 95%. This is why some companies may use MRPII systems but have long given up on achieving Class A.

Many of these companies work in pharma. “Pharma companies tend to have an advantage over other firms when it comes to MRPII because they are used to working in a tightly controlled regulatory environment,” says Jack Gips, the US-based MRPII consultant who helped Abbott UK implement its system. But while he estimates that most of big pharma has some plants operating at Class A, he says the implementation is usually affiliate-led and that the discipline required remains a significant challenge. “Even in the pharma world, one would be hard pushed to find more than 20% of sites at Class A. This doesn’t mean companies aren’t trying; just that it is diffi-

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cult to consistently score at 95%.”

It certainly doesn’t happen overnight. “It has taken us 24 months of hard slog to put into place,” says Haywood. “It is not easy. Companies fail because they underestimate the commitment involved.”

It is the degree of commitment involved in MRPII, and indeed other quality improvement programmes such as Six Sigma and Total Quality Management, that give these programmes a slightly religious feel. The people leading them have to be convinced their efforts will pay off and be able to inspire the workforce with this conviction. “One of the main reasons for companies not reaching Class A is that top management doesn’t buy in to it sufficiently,” says Gips. “It is all down to people committing to the concepts behind MRPII.”

The first stage of implementation at Queenborough was to get people to focus on their own work centre or department, writing procedures for how it might work best and training up people to follow and monitor them. This first stage, involving literally thousands of training sessions and much senior level encouragement, is designed to bring the plant up to 80% efficiency or Class B standard.

The second stage comes when people realise that their performance has ramifications around the entire operation. “A lot of informal and formal teams build up as people start to work together and call in people from other departments to find solutions,”

says Haywood. “This brings you up to 90%, a significant increase in overall performance. Then you start moving towards Class A.”

The staff clearly have to be motivated. They have to want to find and implement better ways of working not just in their immediate sphere but throughout the operation as a whole. Where two measures are counterproductive, they might be asked to find an appropriate compromise. This might happen, for example, over batch sizes where the production team want the largest size for maximum efficiency but the logistics person prefer the smallest to keep the inventory as low as possible.

Fenn says many things were revealed in these early stages. It was found, for example, when concentrating on the accuracy of data, that it had been standard practice not to adjust the computer accordingly when taking a sample of material for testing. “This may never have come to light if we had remained in our silo mentality,” he says. “MRPII pulls everything together. It acts a bit like an orchestra conductor who makes everyone play in harmony.”

Also, because things are being done right first time, jobs naturally evolve and develop. “The QA team can focus on quality in a much broader sense,” says Haywood. “They are now more involved in training people to do in-process testing. Traditionally QA did all the testing but we are now teaching the people who make the tablets to also look at things like how fast they dissolve and their hardness. This makes everyone’s job more interesting.

“MRPII is talked about as a philosophy,” says Haywood. “But I prefer to think of it as a discipline. Everyone has to work together as everything impacts on everything else. The benefits are that people derive a keener sense of responsibility and have a much better understanding of the whole manufacturing process.”

This, he believes, is what motivates them. “Because the main thing is the measure, there is a lot of personal and departmental pride in doing well. It is also a less stressful environment because there is no firefighting as everything is better planned. Things are smoother and people’s jobs are more interesting. Also, because the measures make the star performers more visible, it gives an opportunity for young managers to shine.”

Queenborough is a success story. MRPII is now being rolled out at all Abbott’s manufacturing plants with Class A efficiency as the goal. And Haywood and Fenn take much of the credit for both initiating it and maintaining the belief that Class A standards could, and would be achieved. Now it is just a question of sustaining it. SM