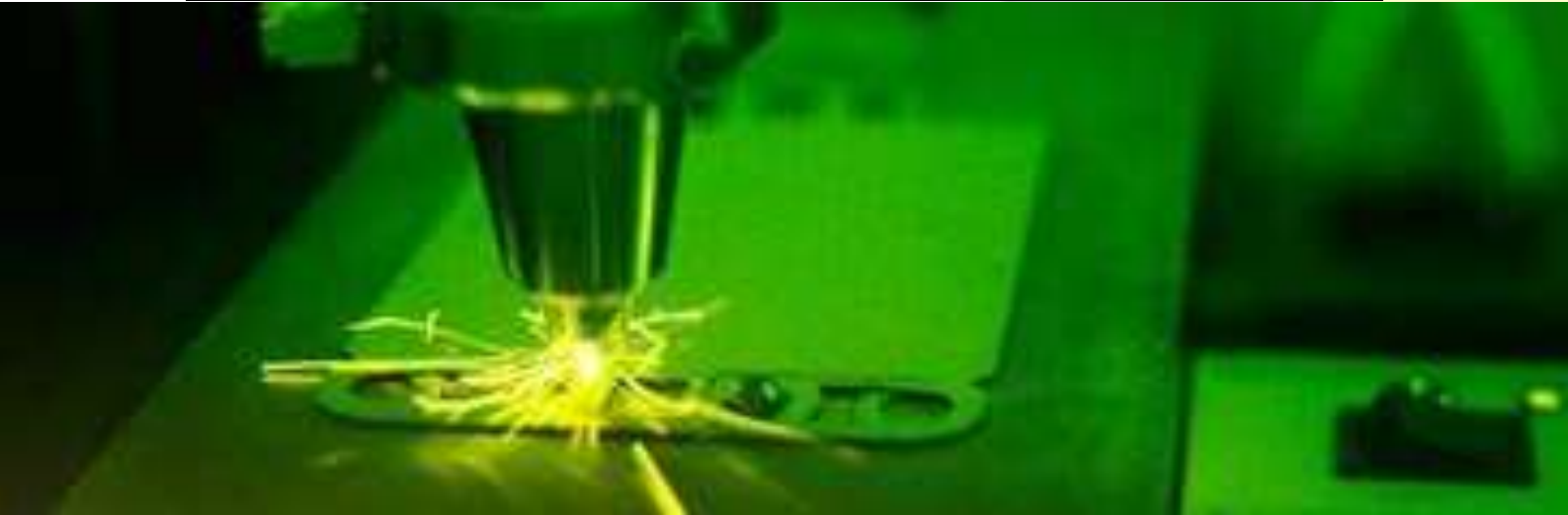




Case Study

**Ceres Power gets ready to scale up
production with Lighthouse Shopfloor-
Online**



Introduction

Ceres Power is a world leading alternative energy company in the UK. It is developing fuel cell technology that works using natural gas to generate electricity. This can be installed as part of a Combined Heat and Power (CHP) unit to generate heat for hot water and central heating, as well as electricity for general usage in the home or business.

This innovative approach to power production has been years in the making and, to date, manufacturing has been on a small scale, for trials only. However, Ceres has large scale ambitions and it was quite clear that its paper-based, spreadsheet-centric systems would not support its operations in the longer term. In fact, by September 2010 production numbers were increasing at a pace. With thousands of spreadsheet records shared across the production process it was ever more difficult to record and save data

accurately and in a timely way. Change was needed.

Focus on Flexible MES (Manufacturing Execution System)

With a new ERP system in place the focus turned to the manufacturing operations software for improved management and monitoring in real time and for effective inventory traceability. The manufacturing processes have many operations and complex routings; so, a user friendly and efficient system was required.

Ceres analysed the market for an appropriate MES solution. Cost of licensing and scalability of the solutions were the main factors in the decision process and these features led Ceres to Lighthouse Systems' door.

Ananda Mello-Costa, Manufacturing Systems and Quality Manager at Ceres, commented, "Lighthouse was definitely the best solution in

the market for what we needed. We demanded an incredible amount of flexibility from Lighthouse in that they had to adapt rapidly to changes in product design even while we were still defining the system requirements. And the software had to be able to operate in all of our manufacturing environments, through batch, automated and manual assembly processes. In mid June 2011 the project began with a series of intense design reviews led by the Lighthouse team.”

Scaling Through Design to Go Live

The design configuration began in September and the system went live in January 2012 with processes being implemented in three phases, each one presenting a unique set of challenges.

Materials Preparation formed the first, pilot phase of the new system. The challenge here was that a few people were performing many processes in small quantities at the same time on different machines.

MES had to be configured with the products, routings, bills of materials, and quality checks to record all that happened in this area. An interface was built to automatically transfer materials from the ERP system to Shopfloor-Online when they are available for use. The user interface had to be trialled to ensure it was going to be easy for all users. The users



record the start and stop of each operation, each lot of material consumed and all quality checks carried out.

Ananda adds, “A major consideration was knowing how other systems had been implemented in the past. Many had simply been installed and then left for the users to get on with it. There had been little opportunity for user feedback and that had meant that a lot of systems never actually did what they set out to do and often the users didn’t understand them. We wanted to do things differently. We needed to find a balance where people were excited and informed but also realised that they had to get on with their day jobs. Presentations of how other companies were using Shopfloor-Online certainly helped to gain buy-in from the users and ensured that they were engaged with the project from an early stage.”

Phase two began in the cell area. The main challenge here was that as many as 20 processes happen at the same time by different people and they all have to occur in a specific sequence. Again more master data was configured to reflect the processes, more user training delivered, and another iteration with the user interface to ensure it worked well for the new users.

At the same time, Ceres introduced bar codes onto the fuel cells, keen to automate the process by scanning parts. This helped to ensure the accuracy of data input into Shopfloor-Online and thereby improve the visibility of parts and products at every stage of production. Ananda says, "We have complex routings through many process steps and many jobs in production. Now we can see exactly where each job is, how far it has progressed and what is left to do"

The implementation phases followed the



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process: phase 1 Materials Preparation; phase 2 Cell Production; and finally to phase 3 Assembly. By taking this approach, the WIP output from the earlier processes are labelled and then ready to be consumed by subsequent processes. So gradually all materials become known to the system working from raw materials up . The system now reflects the true state of inventory and ensures that stock levels are accurate. Another interface back to ERP has been built to inform the ERP system of WIP produced.

So what has been achieved so far? The main benefits cited by Ceres are:

1. To remove all spreadsheets from the manufacturing area - improving the rigor and consistency of data collection, especially with regard to traceability data and also making a big saving non-productive time.
2. With manual processes there were occasions when WIP inventory didn't move when it should and in some cases this led to scrapping WIP that had aged. With greater visibility of WIP this problem has been solved.
3. The data is now immediately available, so that people can analyse the data and use it to react faster.

4. Most importantly, now Ceres are in a position where they can scale up production to meet their strategic goals.

Flexible to Handle Complex Processes and Design Changes

Developing a fuel cell is a complex process that involves a significant number of complex parts, each of which has to be developed in sequence to be assembled in the final phase of manufacture. To add further complexity to the process, Ceres is still making changes to its product, trialling different materials and tracking them through the system. This demands the highest levels of functionality and flexibility within the MES solution and makes it a challenging implementation for the Lighthouse team.

Ms Mello-Costa adds, “We needed an MES system that could deal with the changes we are making to the product and its processes now but also one that can evolve with us as we enter the volume production phase at a later stage. Lighthouse had to work out how to make sure that the system truly reflects our needs at every stage of our corporate development and that was a challenge. But, with this implementation it was not just about the technical tasks, it was just as much about the people and the changes that they were going to have to make to their routines.”

Looking Ahead

With the initial project now concluded, everything operational, the Ceres team can begin to look ahead. The main building blocks are in place so the next step is to address the maintenance requirements of the shop floor. Maintenance modules will form the next phase of the Ceres implementation, once again taking a layer of spreadsheets out of the process.

Ms Mello-Costa concludes, “There will no doubt be more machines, more people and changes to some of the processes but our foundation is strong now in the manufacturing side. Lighthouse has been great and worked with us as a valued and expert partner. It has been a positive experience not just for me but for all of our team.”

Lighthouse Systems is one of the world's leading developers of Manufacturing Execution Systems (MES) with offices in London, Singapore, Australia and Rochester, NY. Lighthouse Systems Shopfloor-Online is web based modular software that provides real time visibility of the entire manufacturing operations environment. Applications include Maintenance Management, Concern Management, Quality, SPC, Downtime, OEE, Spoilage and Inventory Traceability. Shopfloor-Online is being used in a wide range of industries with some of the biggest manufacturing companies; it is deployed in 15 languages in 28 countries.

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