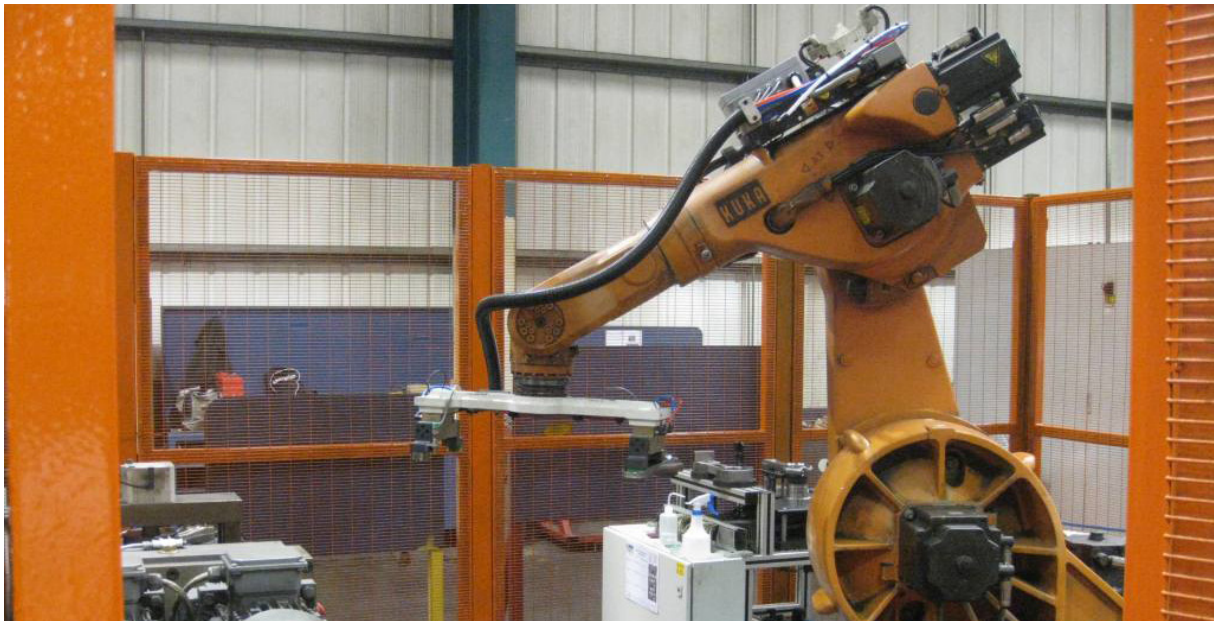
Albon Engineering & Manufacturing plc

Case Study

A Value Stream Mapping and O.E.E. improvement activity, supporting Albon's investment in machinery and tooling, resulting in a 70% increase in line output



Background

Albon Plc. is a large, independent design and manufacturing company specialising in the machining and assembly of engine components for automotive and diesel manufacturers world-wide.

Current activities consist of high volume connecting rod manufacture and bearing cap assemblies which are produced in UK, US and Serbian manufacturing plants. Albon's UK facilities consist of 3 factories near to Southend, Essex.

The Challenge

Albon was facing increasing production demand from various customers. One in particular, a major global manufacturer of diesel engines, was predicting 70% growth in sales of one of its engine variants, which meant that Albon would be required to increase the output on one of its connecting rods lines to meet this demand. Albon's challenge was to physically demonstrate its ability to "Run at rate", within a 3 month period, without entailing excessive cost.

The Objectives

Albon's objective for the project was to physically demonstrate the lines ability to increase output from the current level of 1052 rods per day to a maximum of 1788 per day (+70%) without recruiting additional manpower and without weekend working. Albon also wanted a sustainable, standardised process for replicating this on other lines, for the same and other customers.

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The Industry Forum Solution

A multi-skilled team from Albon worked with an Industry Forum Senior Engineer to create a value stream map capturing all of the issues in the current production line. Albon identified that a new multi-spindle machine would be required, in addition to replacing a vertical machining centre and providing new fixturing, and a robotic finishing cell. The first step was to introduce the concept of Takt time and calculate it for the current and future demand. Three months Downtime and Quality data were analysed, and the OEE (Overall Equipment Effectiveness) was calculated for each process. This information was used to create an effective cycle time (cycle time/OEE) v. Takt time chart to identify the priorities for improvement. This was key to the identification of priorities for improvement activities.

The team took part in a “plug game” simulation and experienced the effect of introducing the lean principles to a production process. Using this knowledge and understanding, a future state map was created, together with an action plan to achieve it. Actions to stabilise the current state, by implementing 5S on 2 of the priority processes, resulted in the target OEE being achieved (and sustained through Standardised Work).

Target OEE levels were set for each process and the effective cycle time v. Takt time chart was continually updated as improvements were verified and used as the driver for further improvements through a series of Rapid Improvement Workshops. Some of the improvements involved eliminating the 7 wastes and implementing revised Standard Work. Others involved technical solutions, with the help of the maintenance department, to reduce machine cycle times, or identifying where additional machines would be required.

A visual management board was created and regular production team meetings were introduced to review actual performance against targets. Visual management was employed to maintain the standard in each work station.

Albon needed a standard process for replicating improvements on other lines and so the Albon Lean Production System (ALPS) was developed. This was made a formal part of the company’s APQP process. A 10 step ALPS implementation checklist was created and the documented evidence of the improvement process was incorporated into the final element of the PPAP submission to the engine manufacturer.

The improvements continued in line with the plan and on 10th July a full line “run at rate” demonstrated an output of 1790 rods per day. The final customer was delighted that, not only had the objectives for this line been met, but the same standardised and sustainable approach was being applied to other lines which manufactured rods for its engines, driven by the Albon change agent. The value stream transformation resulted in the average OEE for 5 of the key machines on the line being increased from a baseline of 73.8% (January through March) to 89.7% (average for July).

The Customer’s View

‘The project has not only allowed Albon to prove that we are more than capable of meeting the projected demand of one of our customers, it has given us a standard structure to use on any new projects. Our other customers like what they are seeing and are asking for the approach to be applied to their product lines. We have replicated the process 4 times already.’

Guy Hamilton, Albon Lean Production System manager, Albon Engineering and Manufacturing plc

“The service and support that the Industry Forum senior engineer provided to Albon Engineering has been a great help to our production lines.

We now have a much better understanding of Value Stream Mapping, Takt time, OEE, Standardised Work, 5S and “run at rate” trials.

We also have set up visual management boards to display this work, and use it to help control our production lines. Our customers are delighted.

Albon will continue using this work throughout our business.”

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