

# CASE STUDY



**How Arrowsmith reduced non-productive time and saved over £300,000 per year!**

*“In pursuit of opportunities to supply the commercial nuclear sector, Arrowsmith Engineering Ltd engaged AIM Professional Services Ltd to engender a climate of high performance management in the workplace that would transform efficiencies and reduce cost”*

## INTRODUCTION

Why do companies need to develop core competences? A key challenge for organisations in competing for the future is to pre-emptively build competencies that provide gateways to tomorrow's opportunities, as well as to find novel applications of current core competences. Any company that wants to capture market share and profit from tomorrow's markets must build the competencies that will make a significant contribution to future customer value.

This value will be created by the acquisition and then application of the knowledge and skills of the workforce. The more skilled and knowledgeable the workforce is and, crucially, the more capable they are of applying what they know, the greater the value of products and services produced and the more profitable the organisation.

Performance improvement is also crucial to the survival and future success of any organisation, large or small. Improvements will only happen if people throughout the organisation are encouraged to learn faster and more efficiently, and to use and share what they learn with others. To achieve that, they need employees who are highly motivated and able to learn, innovate and adapt to rapid external changes.

*"In the long run, the only sustainable source of competitive advantage is your organisation's ability to learn faster than its competition. No outside force can take the momentum of that advantage away from you". Peter Senge (Founder of The Society for Organisational Learning)*

Research in 2007 by McKinsey & Co<sup>1</sup>, a global management consultancy, examined the practices and performance of more than 4,000 medium sized manufacturing operations in Europe, the US and Asia.

The findings supported the proposal that firms that apply accepted management practices well - perform significantly better than those that do not.

This suggests that improved management practice is one of the most effective ways for a firm to outperform its peers.

---

<sup>1</sup> See also page 7 ref. McKinsey & Co

Jason Aldridge, Managing Director, commented:-

*“We have been delighted with the outcomes we have gained so far from the AIM business improvement and leadership programme. This case study illustrates that demonstrable financial benefits can accrue from facilitated work-based learning and self-managed teams. Adding to our core competencies has strengthened our business capability and we are now in a position to apply for SC21 Silver supplier status.”*

For more information contact:-

AIM Professional Services Ltd, [enquiries@aimproserv.co.uk](mailto:enquiries@aimproserv.co.uk)

Tel: - Glyn Jenks 07860 919296

Ron Mackrell 07967 394938

**ARROWSMITH ENGINEERING LTD** 50 Bayton Rd, Exhall, Coventry CV7 9EJ  
<http://www.arrowsmitheng.co.uk/>

Arrowsmith Engineering is an aerospace specialist producing parts from development through to aftermarket.

However, managing director Jason Aldridge realised there was an opportunity to bid for work in the civil nuclear supply chain - the 'Fit for Nuclear' (F4N) programme being run by the Nuclear AMRC (Advanced Manufacturing Research Centre).

F4N lets companies measure their operations against the high standards required to supply the nuclear industry – in new build, operations and decommissioning – and take the necessary steps to close any gaps.

This opportunity came at a time when Arrowsmith were under increasing pressure from a growing order book and was faced with balancing the constraints of quality, cost and delivery times.

After being audited by the F4N service, the management team embarked on a High Performance Leadership and Management Development programme, certificated and provided by AIM Professional Services Ltd. The programme designed by AIM is specifically for SME's in manufacturing, and is ILM accredited (Institute of Leadership & Management).

Subsequently, the management team led by general manager Martin Porter were determined to stay ahead of the competition and ensure that the company became more profitable whilst meeting the high standards set by the F4N programme.

The management team are highly motivated and are working closely together to focus on reducing 'waste' in all their processes. Their most recent project is to further reduce 'set-up' times on the CNC machines by eliminating waste in associated processes.

The team proposed a number of innovative initiatives costing in total around £15,600 which will result in ongoing savings of £6,114 per week - **£312,000 per year!**



## OBJECTIVE

With the management team upskilled in High Performance techniques, their goal was to identify individual projects that were worthy of consideration and financial investment.

One project which stood out as producing the most significant return on investment was reducing non-productive time on the machines.

## BACKGROUND

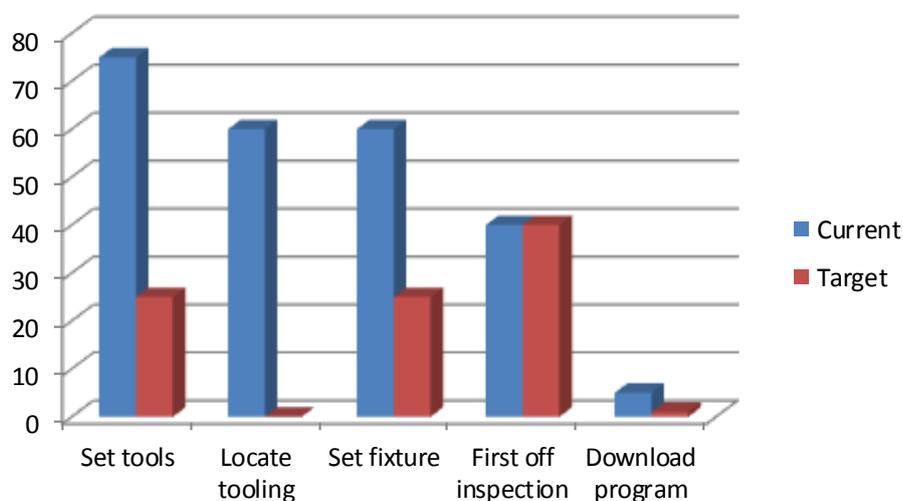
Around 180 hours a week were spent setting the machines. The low level of productivity meant that the hourly rate charged was higher than that expected by many customers and this was restricting the company's growth beyond its current level of turnover. In addition, as the company generally quoted using set-up times of 2 hours which were then not achieved, net profit was lower than expected.

There were a number of areas where time was wasted which contributed towards high set-up times:

- Locating tooling.
- Setting tools on the machine.
- Downloading/uploading programs.
- Altering programs.
- Familiarisation of set-ups.

The management team proposed implementation of a number of initiatives with the aim of reducing set-up times to an average of 1.5 hours. This would have the effect of increasing productivity by around 12% which could generate savings of £6000 a week.

SET-UP ELEMENTS – CURRENT V. TARGET



## PROJECT DETAILS

The aim of the project was to attain a state where all tooling is present at the machine before the machine is set i.e. while the previous job is still running. This would eliminate a large proportion of the set-up time. To achieve this, the following actions were proposed:-

- Further define the machining cells.
- Move kit boxes to machining cells.
- Amend kit lists to include all tooling and the tooling location (kit box, vending machine, etc.).
- Remove all standard tooling from kit boxes and locate in vending machine or tooling racks.
- Remove gauges from kit boxes and locate in inspection rooms.
- Standardise the tooling in turrets/carousels.
- Load tooling data for each part number onto the vending machines.
- Preset tooling off the machine and store with offset data.
- Have all required tooling waiting at the machine prior to set-up.
- Create set-up sheets for all turning and milling operations.

Tooling would be loaded onto a trolley by the team leader/foreman and wheeled to the machine when needed. The aim is to remove the need for the operator to leave the machine.

## INVESTMENT REQUIRED

### Upfront costs

• Additional racking	£800
• Trolleys	£750
• Tool holders	£550
• Tool Pre-setter	£5500
• Engineer cost during implementation (15 weeks)	£8000
<b>Total</b>	<b>£15600</b>

The costs are minimal but the project is reliant on taking an operator off a machine to manage the kit lists, pre-set tooling, create set-up sheets, standardise tooling, load the vending machine data, etc. The cost of the additional engineer is covered by the increased productivity and it is not envisaged that this person will need to be replaced on the shop initially.

The savings generated would pay back the upfront investment costs in less than 1 month and cover the ongoing costs of taking a man off the machines leaving a net saving of £6114 per week (**£312000 per annum**).

There are also additional benefits such as lead time reduction and reduced inventory.

The table below shows the estimated weekly cost saving. This is based on an efficiency, once running, of 90%.

	<b>Current</b>	<b>Proposed</b>
<b>Attended Hours</b>	779	741
<b>Efficiency</b>	90%	90%
<b>Adjusted Hours</b>	701	667
<b>Actual Produced</b>	520	584
<b>Hours spent on Set-up</b>	181	83
<b>Average No. Of Set-ups</b>	55	55
<b>Average Set-up Time</b>	3.3	1.5
<b>Productivity %</b>	67%	79%
<b>Cost of lost time (@ £60 p/h)</b>	£15,540	£9,426
<b>Cost saving per week</b>	<b>£6,114</b>	

## TIME REQUIRED

- Recruit engineer internally 10 days
- Train engineer 20 days
- Define machining cells 5 days
- Re-locate kit boxes 15 days
- Set up pre-setting area 15 days
- Standardise tooling 20 days

The remaining actions are ongoing to be completed prior to job launch dates by the project engineer:

- Kit list amendment.
- Load tooling data into vending machine.
- Set-up sheets creation.
- Pre-set tooling.

## TIMING PLAN

Week no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Applications for engineer	█																
Engineer selection process		█															
Familiarise engineer with project			█														
Engineer training				█	█	█											
Re-define machining cells							█										
Kit box relocation and rationalisation								█	█	█							
Set up presetting area											█	█	█				
Standardise tooling														█	█	█	█

The importance of Leadership and Management development was underlined by a recent survey from Mckinsey & Company:-

McKinsey & Company is the influential, and global, management consulting organisation and trusted advisor and counsellor to many of the world's most influential businesses and institutions.

In a recent (Jan 2015) survey of 189,000 people in 81 diverse organisations around the world they found that in organisations where leadership performance was strong (i.e., the top quartile of leadership effectiveness as measured by McKinsey's Organizational Health Index) leaders focused on four main types of behaviour, these were:-

- **Effective problem solving.**

A key input into decision making for major issues as well as daily ones (such as how to handle a team dispute).

- **Operating with a strong results orientation.**

Leaders with a strong results orientation tend to emphasise the importance of efficiency and productivity and to prioritise the highest-value work.

- **Seeking different perspectives**

Leaders who do well on this measure encourage employees to contribute ideas that could improve performance, and accurately differentiate between important and unimportant issues.

- **Supporting others**

Leaders who are supportive, understand and sense how other people feel. By showing authenticity and a sincere interest in those around them, they build trust and inspire and help colleagues to overcome challenges.

The project outlined in this case study was developed through participation in the AIM Leadership and Management development programme which was conducted on-site and delivered in half day sessions to minimise disruption to the day-to-day running of the business.

Some key topics included in the programme were:-

- Leadership and Management Skills, and understanding the difference between leadership and management activity.
- High Performance Management.
- The Pit Stop Mentality.
- Motivation and identifying the key drivers and intrinsic needs of individuals (with reference to Maslow, Herzberg, and McGregor).
- Employee engagement, and how to create an engaged workforce.
- Identifying your personal leadership and management style, and how to improve it.
- Emotional Intelligence and Conflict Management.
- Coaching skills for managers.
- Effective problem solving techniques.
- Presentation skills for managers.

During the programme, managers were encouraged to develop projects that could improve company performance.