

- *Supply chain process understanding and improvement*
- *Partnership relationship with suppliers*
- *Project champion and senior level support*
- *82% reduction in stock*
- *56% reduction in process times*
- *Supplier service level rating increased from 65% to 95%*

• Introduction

BAE Systems has resulted from the merger of British Aerospace and GEC Marconi Systems. The company manufactures critical wing components for all Airbus aircraft. Two sets of wings are transported daily from its site at Broughton in North Wales, to Toulouse in France and Bremen in Germany, where the finished aircraft are assembled by the Airbus partners.

• The Problem

“Fasteners” is a collective term for items like nuts, bolts and rivets, used in very large quantities to hold the components of the wing together. The fastener operation, one of the largest in the world, was under pressure to improve, from forces both inside and outside the company. Internally, BAE Systems wanted to improve management, storage, distribution and usage of the fasteners, ultimately to reduce costs.

Outside influences included the Civil Aviation Authority who required improved traceability, and fastener suppliers who required greater visibility of fastener usage in order to improve their service and profitability.



Airbus A340

The fastener stores utilised an inflexible system with limited part number and transaction functionality. The staff made it work but frustration was inherent, and they were constantly criticised for a problem that manifested itself in stores but was itself, not the source of the problem. Physically, the area was cramped, dark and overstocked with inadequate racking.

John Champion, Group Commodity Manager, Airbus UK, spearheaded the drive for change and ensured that those responsible for the success of the initiative had the resources and the support that they needed.

“Change of this magnitude is never easy. Success depends on effective communication of the vision and having the right people with the right tools to execute the vision.”

• The Project Team

Two departments, Procurement and OSS (Operational Support Services), began the search for improvement. Ruma Deb led the initiative for Purchasing and accepted requests for proposals from several potential system providers, and Andy Caldwell and Amanda Burns drove the initiative on behalf of OSS. In order to understand the operation better, the team moved their office to the store and worked in the area to better understand and map the current processes and analyse the work orders. Previously the information had been known only by experienced operators but not documented.

The team soon recognised the need to automate the operation with an IT solution that incorporated lean supply chain principles and a bar code driven warehouse management system. In September 1997, WaerLinx™, from Waer Systems Limited, was chosen as the most suitable solution.

Waer Systems Limited, an international company specialising in supply chain technologies for effective component management, was spun off from CJ Fox, a long time specialist distributor of aerospace fasteners and provider of Just in Time (JIT) solutions. Waer Systems was formed to offer WaerLinx™ as a multiple supplier 'pull' warehouse management system to aerospace, automotive and industrial manufacturing operations.

• Implementation of the Solution

The internal BAE Systems project team then expanded with the addition of three major fastener suppliers, including C.J. Fox, who employ 80 staff in two locations in England, and have been a strategic supplier to BAE Systems for more than twenty years.

This team had responsibility for implementation of the new system, and they began by entering the old stock onto the new system. It took one week from going live to resolving the teething problems, and little formal training was required to operate the new system. Most of the training was to do with learning the new processes for parts flow and paper work.

Importantly, the team chose the Airbus A320 – Stage 3 team as their pioneering group because they were the team most inclined towards change and process improvement. They demonstrated that the system could work and their experience helped to further improve the process before it was rolled out to other users. Due to this early, high profile success, other business units approached the team and asked if they could be incorporated onto the new system.



Wing assembly

• Project Champion

The project champion, Andy, was constantly seeing the potential for improvement. His direct line and close relationship with the system developer, Paul Maines, IT Director at Waer Systems and founding author of WaerLinx™, ensured that improvement was continuous to meet the needs of the business. In addition, his vision for how the system could operate was infectious.

Two years after initiation of the project, the system was handling 250,000 transactions per annum and controlling 7,500 part numbers from 70 suppliers (13 consignment suppliers).

“Meeting the twice-daily wing target was a matter of pride for all of us and missing the deadline due to a fastener shortage was not an option,” according to Andy. This approach led to the development of a number of new features, e.g, traditional pick lists became obsolete because the system prints the bag labels in the order that they should be picked, by store location and also prompts the task of carrying out rolling stock checks so that any inaccuracies are corrected immediately.

The improvements in service and cost resulting from the process improvement and installation of the new system are listed in Table 1.

Table 1	Fast Measurable Results
	An 82 % reduction of BAE Systems owned stock in the main store
	A reduction in fastener usage of 10 - 20 % due to less waste
	A reduction in shortages from 700+ to consistently less than 40
	A 56 % reduction in stores process times
	100% traceability of all parts leaving the AGS store
	A payback on the investment of less than 6 months

These are even more impressive when considered in the context of the growth and expansion that occurred in the same period - total wing production for all Airbus models increased from 229 units in 1997 to 346 in 1999 (a 33% increase.)

The goal had been to install a system to automate all unnecessary, mundane work, to allow the operators to focus on getting the parts to line. This now happened at rates higher than ever before, reducing their delivery cycle from 3 weekly to daily. Morale rose with this success, together with a turnaround in the perception of the area, with staff now applying to work inside the store. Internal customers observed less waste and contamination, and confidence in the system, and the fact that the parts will be there when needed, reached an all time high. Andy's team extended their operation to supporting manufacture of the new larger Airbus, the A340-600.

- **Recognition**

The contributions of Ruma Deb, Andy Calow and Amanda Burns were recognised by BAE Systems, when they were awarded the Chairman's Bronze Award for Innovation.

- **The Supplier Experience**

Suppliers have been one of the main beneficiaries of the greater level of data transparency, accuracy and accessibility, enabling all the supply chain partners to optimise their costs and performance. SPS Technologies were a pioneering fastener supplier and manufacturer who partnered with BAE Systems in the initiative, and Table 2 lists their measurable benefits:

Table 2	SPS Technologies' Benefits
	A reduction in supply chain inventories from 3 – 6 months to 2 – 4 weeks
	An increase in their service level rating from the industry average of 65% to 95%, as measured by BAE Systems over a twelve month period
	Up to 73% increase in output from one of the cells manufacturing product for BAE Systems

Dick Howard, SPS Managing Director, also noted, " Now we proactively determine problems before they occur, we can focus production on the most critical items and there is less risk of holding unwanted product in the event of an engineering change or market downturn. Communication problems are reduced too, because everyone in the chain is working with the same information, and it is accurate."

- **Looking Ahead**

Following a company-wide review of fastener procurement policies, BAE have decided on a multiple site rollout of the programme, beginning with implementation of the new system at the other main BAE Systems' wing manufacturing site at Filton, near Bristol.

Further opportunities also exist in BAE Systems' military division and other Airbus affiliates, including the industry transforming Airbus A3XX, which recently won major funding from the British Government.