

With forecasts that at least 35,000 planes will be built over the next 20 years, the commercial aircraft industry would appear to be in rude health. In the UK alone, Boeing has doubled its workforce in the last six years and tripled spending with UK suppliers in order to meet increased demand. But success breeds greater competition and companies from China, Brazil and Russia are putting additional pressure on the supply chain to deliver quality parts on shorter deadlines.

According to Mark Shanley, global business manager at Astute Electronics: "Without a robust supply chain, we will not be able to maximise opportunities and a poorly performing supply chain could seriously impact a manufacturer's time to market."

There are two key performance requirements for the aerospace supply chain: product quality; and delivering products on schedule. In terms of the former, component and sub-system quality can be undermined by the accidental introduction of counterfeit parts into the supply chain.

To counter this risk, Cobham Antenna Systems (CAS) 'commissions' companies that already buy products on its behalf to assess the provenance of these products. Iain Gillespie, CAS' head of procurement, suggests working more closely with partner SMEs and large scale organisations to share the burden of risk.

"We will reward partners that take on a larger proportion of that risk for us," Gillespie said.

Martin Foley, business line manager for aerospace and defence at testing company TÜV SÜD, suggests delays within the supply chain could be reduced if companies starting testing earlier in the product development process.

"Quite often, it is at the qualification stage that things can

Partnering for punctuality

As commercial aircraft production rises, the whole supply chain is brought closer together to ensure that nothing stops the best quality products from being delivered to market on time. By **Peggy Lee**.

go wrong and then you have a supply chain issue. If we get involved from the prototype stage for pre-compliance type testing, many of the problems that may occur during qualification could already have been identified and resolved."

According to Foley, testing lead times could be reduced significantly by designing at the early stage of product development a tailored, single test programme which could cover a range of certification requirements.

He warns that buyers should check the product's certification is less than two years old, as over time there is a risk it no longer relates to



(Above) Cobham's antennas are tested in anechoic chambers.

(Below) An emergency exit hatch from Aeromet for a business jet.



the product in its current form due to material and manufacturing changes.

Testing should also be done before a product is shipped as the final products supplied might not be the same as those ordered.

"A product exhibited at a trade show may subsequently require a reduction in production costs to win a big order and this leads to an adaptation of the final product and its components, which could affect its quality," suggests Jean-Louis Evans, managing director at TÜV SÜD Product Service.

He recommends customers carry out factory inspections; sometimes mass-production is done in one facility and samples are produced in another before submission for testing and certification.

All these quality checks will ensure the reliability of the final product and should reduce any time lost further along the supply chain. According to Paul Everitt, chief executive of ADS, the UK's industry's trade body, a close-knit partnership between different companies in the supply chain will be key to ensuring that it functions efficiently.

"Improving co-operation between suppliers and higher tier customers drives positive change throughout the chain, especially when larger customers encourage their smaller suppliers to invest in performance improvement and product innovation," he said.



Matt Knowles, international corporate communications director, UK and Ireland, Boeing, agrees: “To manage the increase in demand, our procurement colleagues hold risk mitigation ‘stress tests’ on our suppliers’ ability to perform or ramp-up to meet required levels.”

The UK has created various initiatives – including the Supply Chains for the 21st Century (SC21) and the Supply Chain Competitiveness Charter – to promote consistent communication across every tier in the supply chain to minimise the risk of under-quality goods or exceeding deadlines.

Counting more than 760 participants, the SC21 offers a common framework for reporting processes, auditing, quality management systems and other procedures, including the Relationship Management Matrix (RMM).

“Using RMM, the relationship can be measured to identify where there is room for improvement,” Gillespie explains. “Engaging in RMM with a test organisation, for example, helps develop a strong relationship of trust and dependence, and this can be used to continually improve efficiency and allow for more effective forward planning.”

“We work in partnership with a number of companies so that the expectations on each other are being set, measured and actively

reviewed,” Foley explained. “We then try and hone our processes using process mapping to improve either the final deliverable quality or the final deliverable time.”

At Cobham, suppliers’ performance is constantly monitored on a weekly, monthly and quarterly basis and regular meetings organised to assess and find solutions to risks in suppliers’ businesses.

“We profiled our supply chain and identified the top 20 suppliers that hold 80% of the risk,” Gillespie explained. “Using risk analysis, we look at how quickly we could move work if a particular supplier were to go bust. If we identify that as 6 to 12 months, we might look to dual-source.”

According to Gillespie, as part of SC21, the company undertakes a formal supplier review at least once every two years, including a complete health check to check its processes and to look at its organisational models and methodologies.

As well as SC21, companies can use additional workplace standardisation and organisational procedures – such as the 5S and visual management – or they may develop their own internal policies, like the growth and productivity initiative Lean+ at Boeing, to boost efficiency internally.

In one example, Lean+ enabled the company to fix a problem with window reveals by identifying

(Left) Thinking about pre-compliance testing early in the design process can avoid problems during qualification

systematic issues with the plane sidewalls in a Cost of Rework, Repair and Scrap Report. Lean+ brought the window reveal vendor and Boeing together to collaborate on a better design which improved the speed at which it could be installed and therefore also improved the overall quality of the aircraft and its time to market.

“Distributors need to keep ahead of changes in lead times and obsolescence cycles,” said Paul Leys, Avnet Silica’s European technical marketing manager Hi-Rel/Space, “and keep customers informed so they can then make the necessary changes to their order books.”

Additional risks to the supply chain include increasing competition for similar parts from larger market sectors, such as automotive, as well as the threat of Brexit.

“The UK industry employs just-in-time processes necessary to compete globally, which could be seriously disrupted by the introduction of time-consuming customs checks,” Everitt warned.

He does, however, believe the sector could overcome this difficulty by remaining a member of the European Aviation Safety Agency, which enables a single regulatory and certification process among member states to facilitate an internal aviation single market.



“We need to keep ahead of changes in lead times and obsolescence cycles.”

Paul Leys

(Below) Vibration testing conducted at TÜV SÜD on an aircraft seat with a representative human load

