

RFID Briefing

## Up, Up, & Away...

By Andrew Ward

**B**y stream lining and automating processes RFID, Airbus is gaining a strategic advantage over its competitors by saving time, money, resources, and eliminating literally millions of barcode scans and manual data entry steps. Airbus is pro-actively introducing RFID to increase visibility of business operations and enable process improvements across its 16 global assembly and manufacturing plants, multiple industry partners as well as its production and spares supply chain.

"All business savings come from process improvements. It's visibility that we use to improve our processes, and RFID is one of the vehicles we use to achieve that visibility", explains Carlo K Nizam, Head of RFID programmes at Airbus. Airbus understands that RFID can enable process improvement, which in turn leads to competitive advantage, and so the company has taken a proactive approach to identifying where RFID can deliver significant business benefit. "Visibility is something that can help all business processes, both within our four walls and in the wider context of our value chain", explains Nizam, "including all the Airbus entities - manufacturing, logistics and more our suppliers, the operators that use our aircraft and the partners that support them."

However, achieving these process improvements calls for data that's 100% accurate – not always a feature of RFID implementations. That's why Airbus has chosen ODIN Technologies as its hardware Integration partner. ODIN and their team of RFID experts will provide solution design, deployments and support services for Airbus.

"The EasyReader suite of products, used to ensure that RFID deployments achieve the necessary 100% accuracy. It, automates the configuration, tuning and testing of readers as they are deployed", explains Patrick J. Sweeney II, President and CEO of ODIN Technologies. "This service- delivery automation tool has reduced the time to deploy an RFID interrogation zone from eight or nine hours down to 90 minutes."

Airbus adopted a three phase approach to new RFID programmes aimed at improving business processes across its value chain. Phase one looked at warehouse logistics and asset tracking. "We performed a number of industrial, full-blown operational pilots last year", explains Nizam. "Some of those have already been implemented into full operation."

This philosophy matches the ODIN approach to RFID projects: planning, physics, pilot and production. "The planning phase focuses on how RFID will change existing business processes; the physics process focuses on using science to determine the proper strategy for tagging, readers and systems; and then a four to six month pilot determines if the businesscase is proven", says Sweeney. "Following a successful pilot and metrics comparison, the system can then be scaled up to production. We aim for a 12-month or sooner return on investment (ROI)."



### A380 final assembly

One of the phase one pilots, now fully implemented and saving significant amounts of time, money and space, was based at the final assembly plant for the A380, in Hamburg, Germany. RFID tags are fitted to the containers that transport parts between the logistics centres and the final assembly line. There are 750 of these bulky containers needed per A380 and they are delivered across four stories. "Manually tracking the location of such a high volume of containers is very time consuming", says Nizam, "If a container is mis-delivered to the wrong location, the amount of time it would take to find it can cause a lot of disruption. So it's vital to know that they are delivered at the right time to the right place and didn't get misrouted." The containers all look the same and are sealed so workers would only find out they have the wrong one when they open it up which would be too late.

With the entire assembly line now wired up with 40 RFID readers, and all 3000 containers tagged, Airbus has experienced significant benefits from the use of RFID. "RFID allowed us to streamline the process and automate it. It's now a lot faster. Containers are tracked automatically and delivered on time, at the right time, the first time", says Nizam. "That means we don't need extra containers to compensate for the lack of visibility, and they're not cheap. They also take up a tremendous amount of space. And if one ever did get misrouted, then at least with RFID we can easily find it." Another phase one pilot was set up by Airbus with some of its suppliers to label packages with RFID shipping labels. "We worked with enough products and suppliers to give us statistically valid data but without inducing too much risk", says Nizam. "We found the logistics processes were leaner, we achieved 100% data accuracy, we drastically reduced the paper shuffling and hence cut the physical handling time by between 65-70%."

## Airbus Beluga transport aircraft

Featuring one of the most voluminous cargo holds of any civil or military aircraft flying today, the Airbus Beluga, or A300-600ST Super Transporter was developed to carry complete sections of Airbus aircraft from different production sites around Europe to the final assembly lines in Toulouse or Hamburg. To be loaded into the Beluga, aircraft parts such as fuselages are first loaded into jigs - in effect, very large, expensive and specialised packing crates. "When the jig is delivered, the aircraft section is unloaded from it, and the jig is now empty", says Nizam. "On its next visit, the Beluga will again offload new parts and should load up with empty jigs from the previous trip.

All these activities need to be tracked in order to protect smooth transport planning and supply to production lines. Today this tracking is performed via paper and will become more difficult to maintain as we ramp up our production rates. If the empty jig isn't where it should be, the aircraft can't leave and this can ultimately impact the production lines", says Nizam.

Helping to solve this problem is the driving force behind one of the pilots in Airbus's phase two RFID rollout, which focuses on automating and streamlining global transportation, production and manufacturing processes. "We're putting RFID tags onto the jigs and installing readers on the cargo loaders that roll the jigs on and off the planes at Hamburg. That information is sent via a wireless network to our business systems, so the planner in the office can see exactly what's going on in real time. So far, the results from the pilot are very positive and in line with expectations."

## Sheet metal tracking

Another candidate for a phase two pilot is sheet metal tracking at the Bremen plant. "Inside the plant there are many different parts made from sheet metal", explains Nizam. "Each piece is processed on average 10 times, and between each process, you need to confirm what's happened. That is done through confirmation of a work order, which today is a sheet of paper with lots of barcodes. If

you add it all up, that's about 1.5 million times per year that a barcode is scanned to say that a stage of a process is done."

That alone represents a lot of effort, but it can get even more complicated. "If the priority changes or the process changes you need to find where the piece of the material is, and quickly. We have tested what happens if you RFID tag the work orders. We wanted to know, can you see an improvement in the process?"

Can you allow multiple automatic confirmations? Typically RFID doesn't work in a metallic environment, but we've had 100% read rates in our pilot", says Nizam.



ODIN attributes this success to a deep understanding of the physics and then choosing the proper technology to suite the business requirement. This accuracy level is thanks not only to the ODIN Technologies EasyReader suite, but also to the experience ODIN has gained in over 125 customer engagements worldwide, including the largest global projects ever deployed, such as the global rollout for the US Dept of Defense's Defense Logistics Agency.

## Production tooling

Airbus uses many different types and categories of tooling, such as hammers, drills, templates and spacers, at all stages of production. Nizam says: "What's important is that they are in the right place at the right time, so if it moves, it needs to be tracked.

But tools also need to be calibrated. You would typically calibrate on a fixed schedule, perhaps every six months. However, in that time, one tool might have been used only once, and another a hundred times."

Another pilot is therefore looking affixing RFID tags to production tooling. "From a cost and performance perspective you can then calibrate only the ones you need to, only when they need it", says Nizam, "with a clear saving in time and money."

## Part traceability

When Airbus builds a plane, every part that goes into it needs to be traced. "The customer needs a clear idea of each part - every serial number", explains Nizam. "Traditionally, that's done using bits of paper, and we do a good job with paper, but this is going to get more difficult as our production rates ramp up." "We are going to launch an RFID pilots putting tags on the parts themselves, and we think that will increase the efficiency of the data entry process, as well as the integrity, accuracy and robustness of the data itself. This has particular ramifications for us because it's a tremendous amount of our activity - building aircraft is what we do and we have to track and trace what we deliver. This is one of the most interesting pilots - really, one of the key highlights of our visibility and RFID programme."

## Parts in service

Finally, phase three looks at the potential benefits that RFID can offer when its use extends further down the supply chain - parts actually in service with airlines. "For example, when a part is repaired, you can help improve the maintenance process using RFID by reducing the amount of paper", says Nizam. "Usually, when a part comes off a plane you have to wait for the paperwork to catch up. By having the information encoded in an RFID tag on the part itself, you improve the process. And when the part goes back to a supplier, they need that information too."

"The future of RFID is to build business value based on sound metrics", says Sweeney. "Companies like Airbus that have seen this potential in RFID are creating a competitive strategic advantage by deploying RFID before their competitors."

As Airbus progresses with RFID, ODIN's experience as the global leaders in design and testing will be leveraged to pick the appropriate technology for the specific task. This will include using passive RFID, active RFID, as well as investigating and possibly deploying other visibility technologies such as surface acoustic wave, ultra wide band, and real-time location systems.



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