



**Aircelle Maroc**

**SAFRAN**  
Aircelle Maroc

### Benefits at a glance

- ▶ *Production hours increased by 67% from 360,000 to 600,000*
- ▶ *Headcount increased by less than 10%*
- ▶ *20% annual growth*
- ▶ *Safety stock halved*
- ▶ *Service levels (OTIF) increased from 70% to 100%*
- ▶ *Master schedule adherence improved from 65% to 95%*
- ▶ *Inventory days reduced from 120 days to 80, saving €7.5 million*
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- ▶ *Oliver Wight Class A certification for planning and control*

## Customer profile

### **The Pride of Morocco**

Opened in 2006, Aircelle Maroc sits close to Casablanca airport. It is an impressive facility, with 20,000 sq m of high-tech assembly lines, semi-clean rooms and bright modern offices. It supplies nacelles, thrust reversers and carbon fibre composite components for airliners and executive jets. This is a fast-paced business which is growing at the rate of 20% per annum – and now it is gearing up for major new contracts with the help of Class A Planning and Control from business improvement specialists Oliver Wight.

Inspiring  
Business  
Performance

*Oliver Wight*  
OLIVER WIGHT



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***Benoit Martin-Laprade***  
***General Manager***  
***Aircelle Maroc***

Aircelle is part of the €10 billion, 55,000 employee Safran group. The French-owned multi-national operates in 50 countries and operates in three core markets: aerospace, defence and security. Group products range from biometric passports to missile propulsion systems, helicopter landing gear and engine casings for jet aircraft. This last area is where Aircelle operates and it is the European leader in design, production and aftersales for nacelles – the ‘pods’ which house aircraft engines – and reverse thrusters. Customers include major engine and airframe manufacturers, such as Airbus, Gulfstream, Rolls-Royce, Power Jet, Sukhoi and Comac.

Accounting for three quarters of Aircelle’s manufacturing output, the nacelle is almost as complex a product as the engine itself. As well as its critical aerodynamic and structural properties, it also includes sophisticated acoustic and de-icing systems – the nacelle dampens noise from the engine, reducing it by as much as 90%, and it has to cope with extremes of temperature, ranging from several hundred degrees inside, to minus 50 or 60 degrees outside.

Though part of the Safran group, Aircelle is a sizeable business in its own right, with a turnover of €700 million and 3,000 employees. There are seven sites: Le Havre (the largest plant and HQ), nearby Pont Audemer (the European service centre); Burnley in the UK; Plaisir, near Paris (design and customer support); Florange in north eastern France; Casablanca in Morocco; and Toulouse, which is situated opposite the Airbus plants and which supplies the airframer with complete propulsion assemblies, with the engine housed in the nacelle and painted in airline customer’s livery. Aircelle supplies nacelles for aircraft ranging from 20-seater regional and business jets (representing 24% of its business), to medium range airliners like the A320 (24%) and long range airliners like the A380 (43%). It produces more than four completed nacelles every day and there are currently more than 12,000 of its units in service, producing one reverse thrust somewhere in the world every four seconds. The company is growing rapidly.

Aircelle operates in a unique market. The lifecycle of an aircraft is roughly the same as that of a man, at 75 years.

“S&OP is now the real management and decision-making tool of the company; it has not only improved our processes but has also helped us optimise the accuracy and reliability of our ERP system.”

*Fabrice Volard*  
*Strategic Planning Director*  
*Aircelle*



New aircraft are typically in the design and development stage for 12 years; they spend 30-35 years in production followed by 30 years of aftermarket sales, before being placed in retirement. Those of us in our 50s and 60s have already spent our whole life with the Boeing 747 ‘jumbo jet’, but new 747s are still being manufactured. Similarly, the A320 has already been around for 30 years and today’s generation of children will spend all their lives with the giant Airbus 380. This is a market where technology is changing rapidly but where new (airframe) products are rarely introduced.

Benoit Martin-Laprade, General Manager of Aircelle Maroc, says the strategy for his company is to be a centre of excellence and a key player within the Aircelle group, delivering high quality, high volume production with low levels of support – products are typically designed and developed elsewhere in the group and production transferred to Morocco when it is stable. “We don’t intend to design new aircraft nacelles here. Our skills are to produce good quality products which are already mature,” he says.

Most of Aircelle Maroc’s production (70%) is the doors and inlet structures for reverse thrusters for the A320 Airbus; 25% is complete nacelles for the Rolls-Royce engine fitted to Gulfstream and Bombardier executive jets. The remaining 5% is manufacture of various carbon fibre components. Demand for executive jets has remained unabated at 100 aircraft a year.

While Morocco may not be uppermost in people’s minds as a prime manufacturing location, Benoit says they are wrong to assume this is a second rate operation: “We are a world class organisation in a low cost country. We implement the same standards here as we do everywhere else in Aircelle – in fact, if possible, we do so before the other sites in the group.”

Aircelle Maroc has received widespread recognition locally for quality and the management of core practices and is now the first site within Aircelle to achieve the Oliver Wight Class A standard for production planning and control. In fact, it is the first non-French site within the Safran group to



achieve the Class A standard – and the first ever company in Morocco. Oliver Wight consultant Jean-Pierre Fauverge says it is a classic story of service up; productivity up; and stocks down, “but the company has achieved Class A with real panache,” he adds. Indeed, the results and the speed with which they were delivered are impressive – Oliver Wight conducted its first diagnostic of the Casablanca plant in January 2009 and the site achieved Class A just 18 months later, in June 2010.

### **20% annual growth**

Benoit is justifiably proud of the plant’s Class A status and is determined to continue on the same upward path, planning for 20% growth every year for the next five years. The business is already on track to meet his goals: production hours increased from 360,000 in 2009 to 400,000 in 2010, and are targeted to reach almost 500,000 by the end of 2011. The increase will be achieved through a combination of improved efficiency, driven by the Class A programme, new business and the transfer of production from other plants.

It is a mark of the site’s success and the confidence of its customers that it now supplies some airframe manufacturers direct. Aircelle Maroc makes reverse thrusters for the Rolls-Royce BR710 executive jet engine and Rolls Royce’s customers are Bombardier (in Belfast) and Gulf Stream (in Georgia). Now, as a result of production quality and delivery performance, Rolls-Royce permits the Maroc plant to ship direct to its clients. This is viewed as an achievement within the group, too – when production moved from Le Havre to Casablanca, a full time quality controller from Rolls-Royce, who had worked on the line in Le Havre for three years, moved with it. Within 18 months, Rolls-Royce recalled the engineer because he was no longer required.

Achievements such as these have been driven by the Class A programme, says Benoit. “We have confidence in our ability. We know whatever project we take on, Class A gives us the methodology to deliver against the customer’s PO; we aren’t starting from scratch every time. That in turn spreads confidence to our customers as well as to the rest of the Aircelle group,” he says.





Aircelle Maroc only began operating in 2005, when initial work began with 10 employees, all of whom remain today. The current plant was opened in 2006 and the 10,000 sq m shopfloor was doubled in 2008 to enable transfer of the BR710 nacelle production from Le Havre. Since 2006, turnover has grown from €10 to €67 million and the site now employs nearly 400 people.

Employee numbers may have leapt dramatically since the site was established, but achievement of Class A means that continued growth can be met, in the main, through increased output as efficiency improves. Revenues are forecast to pass €100 million by 2014 with 600,000 production hours – an increase of 50% from current levels – but headcount will only increase by around 10%. Currently, two thirds of revenues come from the assembly of nacelles and a third from the manufacture of carbon fibre composite components, but Benoit expects the ratio to be 50:50 by 2014. “We’re planning for 20 percent annual growth but the use of composite components in aircraft manufacture is increasing all the time, so it will become a greater proportion

of our business – and we will be manufacturing more composite components ourselves rather than buying them in,” says Benoit.

Aircelle Maroc is a young company in every respect: the average age of the workforce is 29 years and six months. Almost a quarter of the workforce is female and staff turnover is just 8% per annum.

The Class A programme was introduced by Aircelle HQ to improve service levels, and is managed by Strategic Planning Director Fabrice Volard. It is part of a broader Class A initiative and Oliver Wight’s Jean-Pierre Fauverghe, also works with other divisions of the group: The Le Havre plant, for example, achieved Class A for External Sourcing and for Integrated Business Planning (Advanced Sales and Operations Planning) in June 2010, while the customer support division has recently received Class A for Logistics.

In fact, explains Fabrice, it is also one of the most important projects in the broader improvement plan, for the SAFRAN



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*Ludovic Boisrame  
Supply Chain Manager  
Aircelle Maroc*

group itself ('SAFRAN+'). This bridges all sectors of the company and includes a lean project “Xcellence”, which goes hand in hand with Class A. “The Aircelle Maroc Class A programme has the full support of the Aircelle steering committee, through the central Oliver Wight S&OP process in Le Havre,” he says. “And S&OP is now the real management and decision-making tool of the company; it has not only improved our processes but has also helped us optimise the accuracy and reliability of our ERP system.”

At the start of 2009 when Aircelle Maroc began to work with Oliver Wight, the site’s business model was quite different. It had just one customer, the Le Havre factory, and service levels (as measured by the sales and operation planning process in Le Havre) were somewhere between 70% to 80%. When Class A took hold, OTIF increased to 100% almost immediately and has remained at that level (+/- 2%) ever since.

Ludovic Boisrame is supply chain manager at Aircelle Maroc: he says that focusing production schedules into shorter

timeframes made a significant difference to performance. “Master schedule adherence has improved from 65% to 95%, because we made a fundamental shift by setting the MPS objectives weekly instead of monthly,” he says.

Before then, 60% of the monthly production schedule was being completed right at the end of the month and put into stock: “When we shifted the focus to weekly targets, there was an immediate improvement in performance,” he says. Since achieving Class A, the company has gone further and introduced daily targets (from January 2011) and this resulted in yet more improvement.

Now that production levels have been smoothed out, there is no longer requirement for weekend working to meet targets, so saving additional cost. Also, buffer stock between Maroc and Le Havre has been halved, aided by the introduction of direct delivery to the airframers. The savings run into hundreds of thousands of Euros and the company has received formal congratulations from Rolls-Royce for its ‘class-leading’ OTIF delivery achievements.

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Daily production targets have been welcomed throughout the organisation. Head of production, Gilles Delahoullière, is a long-serving Aircelle employee; he has been with the company since 1971 and worked at Maroc from day one, and says this has been the by far the most important period in the company’s short history: “It is much better for us to have a daily focus on production and much easier for people to work with daily targets.”

And shopfloor manager, Nouredine Ribqi – another founder employee – agrees. “Dividing the weekly target by five allows us to see much more clearly how we are progressing against our objectives, and we don’t have to play catch up at the end of the month. If we have staff absence, I can easily rebalance the line, so we can maintain the takt time and still meet our objectives. Before, I had eight people in the finishing section, so we could make up time at the end of the month; now I only ever need two.”

Ludovic Boisrame says one of the key enablers was the breakdown of barriers between functions, which was

underpinned by the Class A work. As soon as everybody was working from a single set of data, it was easy to see where improvements could be made and measured. “We were operating in silos before and the change in mindset was everything. As soon as people started to understand each other and work together, it made a huge difference,” he says.

Stock accuracy has always been excellent at the Maroc plant – but even here, there has been some improvement. The Class A programme has enabled the business to reduce its stockholding by a third, from 120 days to 80, with considerable savings: “It’s worth £7.5 million, or about £30,000 every working day,” says Ludovic.

There have been dramatic reductions in manufacturing cycles, too: assembly for the A320 unit is down from 12.75 days to just eight, and this is targeted to reduce even further to six days. For the IFS inlet structure, manufacturing time has been cut from 33 days to 25; on the A320 composite parts, it’s a huge drop from 62 to 27 days.





Benoit believes the results from Class A have gone beyond process improvement and have had a powerful impact on Aircelle Maroc's reputation. "It is a globally recognised standard and it really means something to our customers all over the world. Class A underpins our ability to grow and change. Confidence is the key word; whenever we get a new programme from France, we can be absolutely certain we can set off on the right track," he says.

### **Methodology and structure**

Class A is crucial for continuous growth, he says: "Class A gives us a methodology, a structure, and you need that if you plan to grow by 20% every year. There's no doubt that Class A helps us secure new business. And we know we can do it without having to increase inventory.

"It creates a virtuous circle: it's like buying milk in the supermarket. If you're used to buying your litre of milk every day and one day you find the shelves are empty, the next day you buy two cartons just to be on the safe side, which starts to throw everything out."

With the improved daily distribution of schedule objectives, also come efficiencies in logistics. There are now two scheduled deliveries from the plant to Le Havre every week: on Wednesdays (which takes product finished on Monday and Tuesday) and Saturday (which takes output from Wednesday to Friday). Customer agreements mean Maroc can deliver up to seven days in advance of the due date. Deliveries are never late.

Takt time on the A320 section is set at one aircraft per day: two engines mean eight reverse thruster doors (there are four lines; one for each door). Lineside kanbans replenish parts twice a day. The takt time for the BR710 is based on 2.5 aircraft (10 doors) per week. The finishing section caters for both the A320 and BR710 and the takt time is set at eight doors per day – all of this is determined by demand for the complete aircraft (100 per annum in total).

"You don't need a computer to see how things are going; it's visible on the line. When we introduce new projects in the future, we know exactly what we need to do," says Benoit.



HR director Yamina Kassabi has been with Aircelle Maroc since day one. She epitomises the youth and enthusiasm of the operation, and is an enthusiastic supporter of Class A which, she says, has fast become the new way of working for the entire site. Class A is embedded in everything they do, in all daily activities, she says. The way everyone worked so hard to achieve Class A reflects, says Yamina, the special character of the Moroccan people and the youth of the company.

“Moroccans are, by nature, very proactive: When presented with something new, they really seize the task in hand and are capable of extraordinary things in extraordinarily little time. If you say to them, today, that these are the things you need to do to achieve excellence, they will start to achieve results tomorrow or the next day. They react very quickly because they really want to prove what they are capable of. It’s ‘la fierté marocaine’; Moroccan pride.”

Yamina says despite some initial reservations about whether Class A would be difficult, the workforce has taken to it

enthusiastically and everyone has grown in confidence: “There were no difficulties implementing Class A. People are working much better together now.”

It is clear that as a business, Aircelle Maroc is very close to the shop floor and Yamina in particular takes a day-to-day interest. Every morning she tours the factory with Gilles Delahoullière and Benoit is only half joking when he says she claims the credit for meeting daily targets: “she says the results are all down to HR because it is people that deliver results,” he says.

The cultural improvements run far and wide, as cited by Pierre Champiaux, head of manufacturing engineering. An Aircelle employee for seven years, he has been at the Maroc plant for the past two. Having previously worked in supply chain, he understands only too well the benefits of improved communication between supply chain and manufacturing. “Manufacturing people tend to just view themselves as the people that make things; they don’t see themselves as part of planning. But, with Class A, they are able to see the



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*Pierre Champtiaux  
Head of Manufacturing  
Aircelle Maroc*

benefits of working as a team and treating supply chain as an internal customer. Of course, they like nothing less than unstable lead times – so the stability that came with Class A allows them not only to achieve their individual KPIs, but it frees them up to drive technical lead time improvements, too. They now look beyond their own roles and see themselves as part of a greater team.”

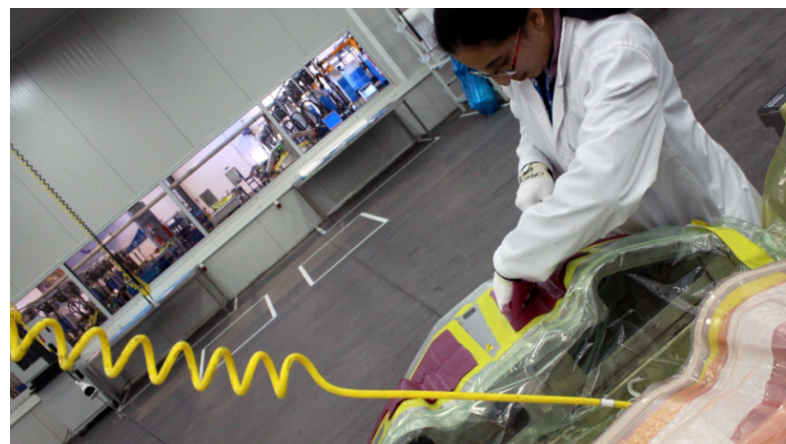
### **Foundation for growth**

Looking to the future, Benoit says Class A will be the foundation for growth at Aircelle Maroc. A new line for the nacelle for the Russian Sukhoi Super Airliner will be installed this year – Maroc already makes composite parts for this airliner but is about to take on production for the entire nacelle, delivering direct to the engine manufacturer, Power Jet. Similarly the nacelle assembly line for the new Bombardier Learjet 85 is to move from Le Havre to Casablanca.

Most significantly, Benoit says, this nacelle will include the first part ‘industrialised’ by the Moroccans: “We developed

the component for production here, rather than inheriting it from Le Havre, as we usually do. It is another big step forward for us,” he concludes.

Aircelle Maroc is a site with powerful ambitions and it has the processes, the structure and the capability to pursue its plans with all the confidence that Class A brings. Perhaps most important of all, it has la fierté marocaine.







Oliver Wight has a 40 year track record of delivering business improvement to some of the world's best-known organisations. We believe that sustainable improvement can only be made through your own people. So unlike other consultancy firms, we transfer our knowledge to you, which means you can achieve performance levels and financial results that last.

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