



**RED ALERT**  
**THE REAL RISKS OF**  
**FLYING WITH THE**  
**RED ARROWS**  
BY PETE COLLINS

**CHINOOK BOOST**  
Latest contract will take  
UK's fleet of transport  
helicopter to 60 by  
middle of decade **22**

**STYLISH SUKHOI**  
Twenty-strong Indian  
order prompts Russian  
firm to launch corporate  
version of Superjet **25**

# FLIGHT

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**FINANCIALS**

# ON TOP OF THE WORLD

We rank aerospace's best performers



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# GROWING SEASON

After the sharp downturn of 2009, profits bounced back in 2010, with Boeing and EADS maintaining clear leadership of our Top 100 ranking of aerospace manufacturers as civil demand overcame defence cutbacks to pull the industry out of recession

IN ASSOCIATION WITH



DAN THISDELL LONDON

**G**lobal financial markets are looking fragile. Oil is priced stubbornly high. Major world currencies are under pressure. Nobody who worried through the summer of 2008 – those phoney war days before Lehman Brothers fell and the financial crisis sucked global economies into the steepest downturn since 1929 – really needs to be asked whether it all sounds familiar. Nor do they need to be reminded of the agony of 2009, when aerospace industry revenue defied ex-

pectations to hold firm – but profits dropped sharply, by more than 17%. Summing up 2009, and also in defiance of expectations, Airbus and Boeing delivered a record 979 airliners – but saw orders plunge to just 413, from a whacking 1,439 chalked up in 2008.

But while financial markets, and thus the real economy, are keeping fingers crossed this summer, it's nice to be reminded that 2010 was, for aerospace, a year of buoyant rebound.

As the latest Flight International Top 100 survey, compiled in association with PwC, shows, revenue grew by a healthy 2%.

That's far from the double-digit growth days

of 2006-2007, and even less than a third of the growth in 2008, despite its horrific fourth quarter. And the 2010 aerospace industry growth didn't keep pace with global gross domestic profit, which bounced back from a 1% fall in 2009 to gain 5% last year, as Western economies rebounded and key developing regions continued to power ahead.

But on the profit front, 16% growth in 2010 nearly reversed 2009's 17% decline. And – again standing as a quick summary of the industry's year – Airbus and Boeing fell just a handful of deliveries short of the all-time high set in 2009, while net orders surged back into

four figures, at 1,104 – enough to push their joint backlog to within sight of 7,000 aircraft.

#### REVENUE GROWTH

Over the year, most of the Top 100 companies enjoyed revenue growth, with a tail of about 30 companies experiencing sales decline.

Expansion by the fastest-growing firms far outpaced backward movement by those at the tail end of the rankings.

The Top 20 companies still dominate the Top 100, accounting for 79% of both revenues and profits. In 2010, there was just one new entry into that Top 20, as strong revenue

growth pulled Dassault Aviation up from 23rd in 2009 to 20th place, bumping out Embraer, which closed 2010 in 22nd place, and has seen revenue fall every year since 2007. Mitsubishi held on in 21st position.

At the top, Boeing kept the crown it regained from Airbus parent EADS in 2009 – though EADS closed the revenue gap a bit in this battle of titans.

The pair remain far out in front by revenue, nearly half again bigger than third place Lockheed Martin, and about twice the size of fourth place General Dynamics.

In the defence sector, growth is

**In 2010, there was just one new entry into the Top 20, as strong revenue growth pulled Dassault Aviation up from 23rd in 2009 to 20th place**

» running well below historic levels. PwC assistant director, strategy, Anna Sargeant says defence-oriented companies are reassessing future priorities. In a sector that is seeing spending pressure, Lockheed Martin nevertheless managed 7.2% revenue growth, to take the top slot from Boeing, which dropped back to second place. Another company to watch is Thales, which has been seen as an underperformer, but is undergoing a restructuring; the company moved from 10th place to 8th, despite a decline in revenue.

**North America and Europe continue to dominate the Top 100, though Asia is growing**

The aero engines sector was also one where growth is small, by historic standards. Rolls-Royce's 7.4% revenue growth far outpaced its peers.

Geographically, North America and Europe continue to dominate the Top 100 by revenue and number of companies, though Asia is growing. However, Sargeant points out that neither Chinese nor Russian companies feature in the Top 100 – their financial data is either unavailable or incomplete – but PwC hopes to overcome this hurdle in future.

**ACQUISITIONS**

In the background, merger and acquisition activity also picked up sharply last year, after falling into a trough as the financial crisis started to bite. Separate figures from PwC show 2010 featuring not only a dramatic bounceback in the number and value of buyout and merger deals, but the return of \$50 million-plus deals.

Total deal value nearly doubled year-on-year, from \$10.9 billion in 2009 to \$20.2 billion in 2010. As PwC's London-based global aerospace and defence practice leader, Neil Hampson, points out, the resurgence of merger and acquisition activity highlights the powerful trends driving the aerospace industry in 2010 – notably the fact that commercial aerospace recovered from the recession faster and stronger than most analysts predicted.

This was also while looking to respond to new competitors and capitalising on a growing market and a changing landscape, as the customer base shifts toward the Asia-Pacific region. The largest revenue growth in the Top 100 was achieved by Triumph, due to its acquisition of the remainder of Vought Aircraft in June 2010.

United Technologies, for example, made some \$3 billion worth of acquisitions in 2010, including a \$1.8 billion purchase of GE Security. ■

Drill down into the Flight International Top 100 online at [flightglobal.com/top100](http://flightglobal.com/top100) or see [flightglobal.com/pwcdataexplorer](http://flightglobal.com/pwcdataexplorer)

**PROFILE TRANSDIGM ALAN DRON**

**A SUM OF MANY PARTS**

TRANSDIGM GROUP might not be an aerospace name that resonates, but the manufacturer is headed for billion-dollar annual turnover via a strategy of making small components that a passenger never considers, but are nonetheless vital in getting an aircraft to function. Electro-mechanical actuators, pumps and valves, electric motors, audio systems, latches and locks – the product range rolls on.

Cleveland, Ohio, US-based TransDigm has been stealthily climbing the Top 100 for several years – from 72 in 2008 to 69 in 2009 and 64 in the latest rankings, with sales of \$828 million in 2010.

Delving into the product range gives clues as to why: TransDigm claims more than 95% of its products as proprietary items to which it owns the design. About 60% of its revenue comes from aftermarket sales: even if orders for both the civil and military aircraft sectors were to slow simultaneously, airlines and squadrons would still have to keep their existing equipment in the air. As an added benefit, notes TransDigm, aftermarket revenues historically produce a higher gross margin.

TransDigm has traditionally looked to acquisitions to increase revenues, and 2010 was no exception. The firm bought four companies in the calendar year – two beyond its fiscal year, which ended on



Sikorsky CH-53 is one TransDigm destination

30 September. The assets picked up were valve maker Dukes Aerospace, sensor specialist Semco Instruments, the actuators business of Teleflex and, largest of all, McKechnie Aerospace, a holding company consisting of seven major operating units that primarily sell proprietary engineered components. McKechnie joined the TransDigm fold in a \$1.27 billion deal.

In its annual report, TransDigm notes that "our market research tells us there is no shortage of good prospects" in both the near and

**AT A GLANCE**

- Top 100 rank 64
- HQ Cleveland, Ohio
- Aero revenues \$828m
- Sales growth 8.7%
- Operating margin 43.8%
- ROCE 14.2%
- Employees 2,400
- CEO Nicholas Howley

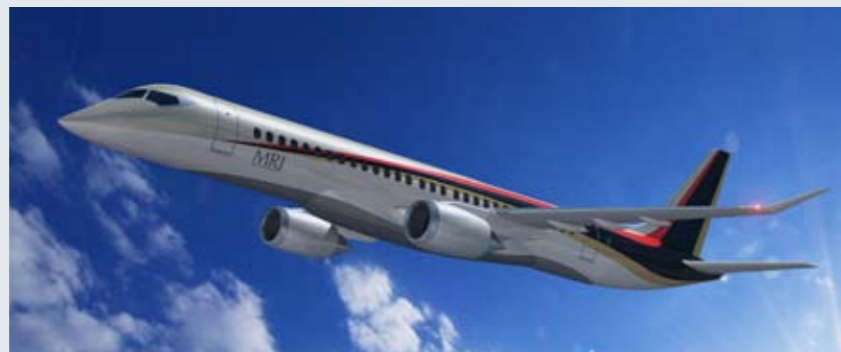
long-term, and that its acquisition policy would continue. Among 2010's highlights were development work on the Airbus A380 and A350 cockpit security systems, which in turn led to a contract award for the cockpit security door module for the Mitsubishi Regional Jet.

The company also completed development work on the digital audio system and several other components for the Boeing 787.

In the military sector, the company won contracts to enhance the capabilities or extend the operational life of several helicopter types, including the Boeing CH-47 Chinook and Sikorsky CH-53.

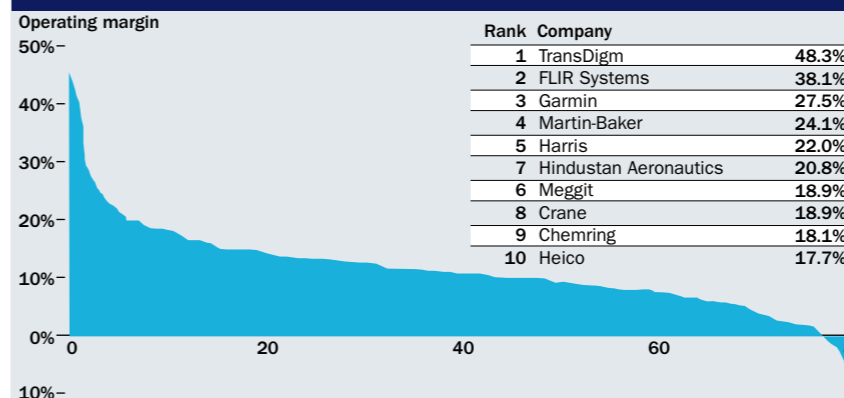
In the fixed-wing sector, TransDigm won work on the Boeing P-8A Poseidon maritime patrol aircraft and the Northrop Grumman RQ-4 Global Hawk.

TransDigm believes its momentum will continue through 2011. ■



Work for Airbus led to a Mitsubishi Regional Jet contract for TransDigm

**AEROSPACE OPERATING MARGIN\***



NOTE: \*Available for 80 companies. SOURCE: PwC

**ENGINES (CIVIL AND MILITARY)**

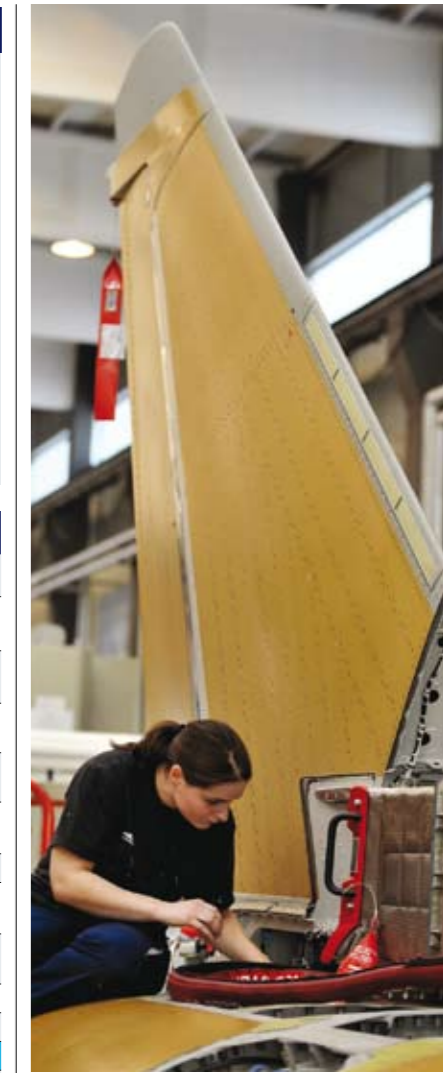
Sector Rank 2010	Sector Rank 2009	Company	Division	Sales 2010 (\$m)	Sales 2009 (\$m)
1	1	General Electric	Aircraft Engines (excl. Smiths est.)	15,680	15,615
2	2	United Technologies	Engines (Pratt & Whitney)	12,935	12,392
3	3	Rolls-Royce	Civil Aerospace and Defence	10,875	10,124
4	4	Safran	Propulsion (Air & Space)	7,424	7,888
5	5	Honeywell*	Aerospace (estimates)	5,287	5,065
6	6	MTU		3,586	3,630
7	7	IHI	Aero-Engines & Space Operations	3,064	2,957
8	8	Avio	Aeroengines and Avioservice	1,943	1,963
9	9	Volvo	Aero	1,069	1,020
10	10	ITP		640	666
<b>TOTAL</b>				<b>62,504</b>	<b>61,321</b>

NOTE: \*Uses same growth rate as P&W. SOURCE: PwC

**DEFENCE AEROSPACE**

Sector Rank 2010	Sector Rank 2009	Company	Division	Sales 2010 (\$m)	Sales 2009 (\$m)
1	2	Lockheed Martin	Includes aeronautics and electronics	27,598	25,733
2	1	Boeing	Includes 85% of Boeing Defense, Space & Security	27,152	28,612
3	3	Northrop Grumman	Excludes shipbuilding and 40% of aerospace (space estimate)	23,674	23,374
4	4	BAE Systems	Excludes Land and Armament Systems	23,651	21,348
5	5	Raytheon	Excluding intelligence and info systems and estimated space revenues (\$1000m)	21,426	20,677
6	6	Finmeccanica	Excludes 34% aeronautics; 15% helicopters, space	17,616	17,540
7	7	EADS	Excludes Airbus Commercial, space and 50% Eurocopter	16,218	15,305
8	10	Thales	Defence and security	9,955	10,418
9	8	United Technologies	80% Flight Systems (Sikorsky, Hamilton Sundstrand)	9,834	9,478
10	9	L-3	Includes 71% sales to DoD of which 75% estimated to be aerospace related	8,350	8,315
11	11	Honeywell	US government sales	4,354	4,288
12	12	Textron	Bell Military and Textron Systems	3,979	3,546
13	13	Israel Aerospace Industries (IAI)		3,148	2,881
14	14	Dassault Aviation	Defence division	1,270	1,364
<b>TOTAL</b>				<b>198,225</b>	<b>192,879</b>

SOURCE: PwC



EADS is in the fray with the Eurofighter



Narrowbody production rates are key to many firms' sales

**TOP 10 SALES BY GROWTH**

Rank by growth %	Top 100 ranking	Company	Growth %
1	33	Triumph	124.4%
2	51	Kongsberg	37.6%
3	90	Heroux Devtek	23.8%
4	36	Hindustan Aeronautics	21.2%
5	98	Terma	21.1%
6	67	Amphenol	20.5%
7	28	Precision Castparts	19.4%
8	48	CAE	18.2%
9	95	Martin-Baker	17.5%
10	62	Chemring	17.3%

SOURCE: PwC

**COMMERCIAL AIRCRAFT**

Sector Rank 2010	Sector Rank 2009	Company	Sales 2010 (\$m)	Sales 2009 (\$m)
1	1	Airbus Commercial (excl ATR)	36,659	36,668
2	2	Boeing	31,834	34,051
3	3	Bombardier	8,614	9,357
4	4	Gulfstream	5,299	5,171
5	5	Dassault Aviation	4,276	3,393
6	6	Embraer	2,889	3,382
7	8	Hawker Beechcraft	2,805	3,199
8	7	Cessna	2,563	3,320
9	9	ATR	1,350	1,400
<b>TOTAL</b>			<b>96,289</b>	<b>99,940</b>

SOURCE: PwC

**PROFILE KOREA AEROSPACE INDUSTRIES GREG WALDRON**

**EAGLES KEEP REVENUES SOARING FOR KAI**

KOREA AEROSPACE Industries (KAI) moved up to 56th position from 63rd in the 2009 rankings. In 2010 both operating profit and margin more than doubled, to \$106 million and 9.5%, from \$44 million and 4.6% in 2009.

Korea's dominant aerospace player attributes its strong operating numbers to a number of factors. Foremost among these is

increased revenue from full-scale production of the T-50 Golden Eagle advanced jet trainer and its T/A-50 attack variant, as well as production of the KT-1T basic trainer for the Turkish air force.

The company said these programmes helped revenue grow to \$1 billion in 2010 from \$954 million in 2009. "KAI has continuously tried to improve the

management of our business since the company's founding in 2000," says KAI. "We believe our efforts have started to pay off, leading to lower production costs as well as an increase in efficiency." In the coming years, KAI hopes to place a greater emphasis on producing systems for commercial aircraft. The company is involved in both the Airbus A350 and Boeing

787 programmes. It produces the wing rib for the A350, and the wing box for the 787.

"Currently the ratio of production of military to civilian projects is 60-40, but we hope to change this to 50-50 in the near future," says KAI. In 2011, the company has scored a major coup with the first international sale of the T-50, with Indonesia committing to 16

aircraft. The type is also involved in competitions in Poland and Israel. The aircraft, which was co-developed with Lockheed Martin, will be a contender in the USA TX competition to replace the Northrop T-38 Talon. Long term, the company says the market for advanced jet trainers is 3,300 over the next 20 years, and it hopes to get a 30% share of this. ■



KAI's T-50 Golden Eagle is bringing in a strong revenue stream for the Korean company

**AT A GLANCE**

- Top 100 rank 56
- HQ Seoul, South Korea
- Aero revenues \$1,112m
- Sales growth 16.6%
- Operating margin 9.5%
- ROCE 12.6%
- Employees 2,950
- CEO Kim Hong-Kyung

**PROFILE CIRCOR ALAN DRON**

**BUILDING THROUGH ACQUISITIONS**

A COMBINATION of an acquisitive nature and close attention to lean manufacturing processes has brought Circor Aerospace into the Top 100, taking the final place in the rankings.

Headquartered in Corona, California, but with operating locations spread over four continents, the company's activities in 2010 could be broken down into three main categories – fluid and pneumatic controls (50%), landing gears (34%) and electromechanical controls (16%).

Although it obviously aims to stimulate organic production, acquisition is "core to our business system", the company says. "We prefer to acquire a company that fits within our core product line-up."

Among acquisitions that began to contribute to the company's bottom line in 2010 was the former Castle Precision, of Sylmar, California, which manufactures landing-gear components and subsystems and provides maintenance, repair and overhaul (MRO) services to

both the commercial and military aircraft markets. Its manufacturing capabilities and product lines complemented Circor Aerospace's existing range of landing gear and actuation products, such as complete landing gear for the Boeing CH-47 Chinook heavy transport helicopter. Last year, Circor achieved the first stage of integrating its landing gear model line into production.

Circor's operations in this field began with MRO activities on the CH-47's landing gear. Its streamlined process in this field impressed Boeing and the US Army sufficiently that it was given the opportunity to move from maintaining and overhauling the gear to manufacturing

it. Work also began to accelerate on design and development of speed sensing and control instruments such as landing gear wheel tachometers for Airbus's A350 XWB, which it is developing under contract to Messier-Bugatti-Dowty.

The A350 XWB also yielded contracts to design and develop the new airliner's landing gear door actuators and hydraulic control manifolds.

Circor's French operations were also bolstered last year by the merging of the ADN (Ateliers de Navarre) facility into Circor Bodet. ADN has expertise in AC and DC motors, plus stator, rotor and solenoid and bobbin assembly.

The company's European activities are bolstered by its Moroccan facility in the Tangier free-trade zone – Circor Maroc (formerly Atlas Productions) – which specialises in low-cost manufacturing of aerospace components, proximity to the European market, plus free-trade agreements with the European Union and USA. ■

**AT A GLANCE**

- Top 100 rank 100
- HQ Corona, California
- Aero revenues \$119m
- Sales growth 4.9%
- Operating margin 13%
- ROCE 3.9%
- Employees 2,950
- Group VP Michael Dill



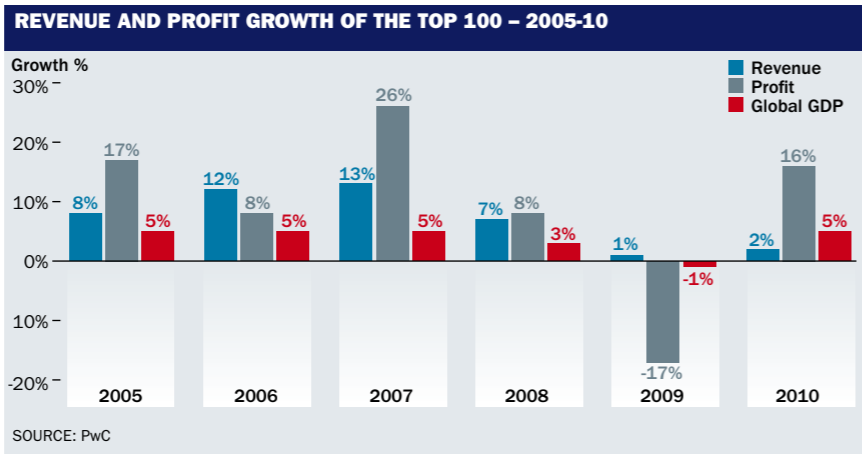
Circor's business centres on landing gear and hydraulics



Both military and civilian aerospace manufacturing has seen a continuing – if slow – growth as 2011 goes on



The commercial aircraft sector has been characterised by volatility since the 2007-07 market peak



**PROFILE PRECISION CASTPARTS** ALAN DRON

**CASTING FOR ROUTES TO RECOVERY**

“FOR US, calendar 2010 really saw the beginnings of the recovery in our aerospace business,” says Precision Castparts’ director of communications Dwight Weber.

Portland, Oregon-based Precision makes a wide range of complex castings, forgings and fasteners for the aerospace industry, with many of those products ending up in powerplants on Boeing, Airbus, Bombardier and Embraer aircraft.

“We’re like a big job shop. We make parts to customers’ design specs,” says Weber. Precision felt the effect of the global economic downturn significantly.

In contrast to early 2008, when its ultimate major customers – Boeing and Airbus – were anticipating a 10-

15% increase in output in 2009-10, the combination of the 2008 Boeing machinists’ strike and the recession took their toll.

“The question turned from by how much Boeing and Airbus were going to increase their rates to whether they would be able to maintain them.”

In fact, those rates were indeed maintained, but with the supply chain full of mate-

rials, Precision had to rein in production to adjust to reduced demand. “From the aerospace side of the business, in 2010 we began to see a recovery in our casting and forging businesses because eventually that inventory was depleted.”

On the fasteners side, demand remained low because one major distributor of Precision’s products bought a competitor, resulting in a continuing surplus of parts. Despite the lengthy process of recovery, Precision Castparts rose from 32nd to 28th in 2010’s Top 100.

Like many companies, it used the recession to look closely at costs. The workforce was trimmed and better use was made of remaining, highly skilled personnel. Productivity in-

creased “markedly” as a result, says Weber.

“In our forgings business, where 60% of our cost is metal, we concentrated on getting better yields and better reverts [shavings and other waste that can be re-melted]. Fasteners had never been through a downturn with us before, as we acquired the main business in 2003, so we engaged in having them work out a new cost structure in each of their facilities.”

Precision at least did not have the added problem of excessive competition, particularly from low-cost nations: its products are sufficiently complex that few companies are able to produce them, while many of its processes are for military aircraft, and thus non-exportable. ■



Despite steady Boeing output, Precision was hit hard by the downturn

**PROFILE DIEHL ALAN DRON**  
**FLUSHED WITH SUCCESS**

DESPITE WHAT it described as only “restrained growth” Diehl’s Aerosystems division raced up the Top 100 rankings in 2010, rising from 93 to 69.

The rise was the result both of organic growth and the purchase from Airbus, early in 2010, of Hamburg-based Dasell Cabin Interior, which designs, manufactures and overhauls cabin interior components – particularly lavatories. Perhaps Dasell’s most prestigious current programme is producing the onboard shower spas for first-class passengers on the Airbus A380.

Dasell joined Diehl Aircabin, which makes cabin modules such as crew rest compartments and Diehl Aerospace, which designs and manufactures avionics and lighting systems for civil and military

aircraft. Both latter divisions are joint ventures between Diehl and Thales.

Although Dasell became the smallest constituent of Diehl Aerosystems, it helped the division’s sales to rise to €542 million (\$719 million), from €514 million.

Without the acquisition sales would have dipped, because of a postponement in the A380 programme.

**AT A GLANCE**

- **Top 100 rank** 69
- **HQ** Überlingen, Germany
- **Aero revenues** \$71.8m
- **Sales growth** 5.4%
- **Operating margin** N/A
- **ROCE** N/A
- **Employees** 2,978
- **CEO** Rainer von Borstel

Dasell’s business complemented the existing Aerosystems product portfolio without any overlapping, strengthening the division’s capabilities of complete aircraft cabin systems.

The division reported that general development of the aviation sector had been “very positive”, with the recession left behind and the commercial sector resuming the role of growth driver after corporate sales had been largely stabilised through the recession by defence earnings.

With Boeing and Airbus having increased order backlogs to almost 3,500 apiece, Diehl Aerosystems’ production facilities were fully utilised, and will continue to be for the next few years.

Diehl Aircabin also received a fillip when it achieved Design

Organisation Approval from the European Aviation Safety Agency. This enabled it to develop major changes on components and modules of commercial aircraft independently, then submit them for approval by the regulatory authorities.

This capability covers development of components for aircraft cabin interiors, galleys, crew rest compart-

ments and environmental systems for commercial aircraft. The political decision to proceed with the Airbus Military A400M transport aircraft was further good news. Throughout 2010, however, development activities at Aerosystems were dominated by the Airbus A350 XWB, which attracted considerable project-specific investment. ■



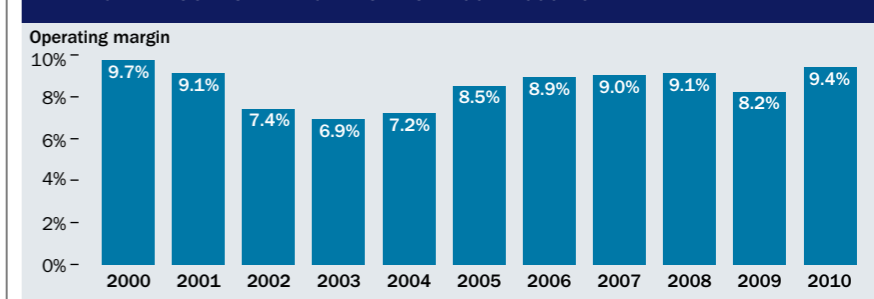
Diehl landed a lucrative contract for the A380

**TOP PERFORMERS BY OPERATING MARGIN**

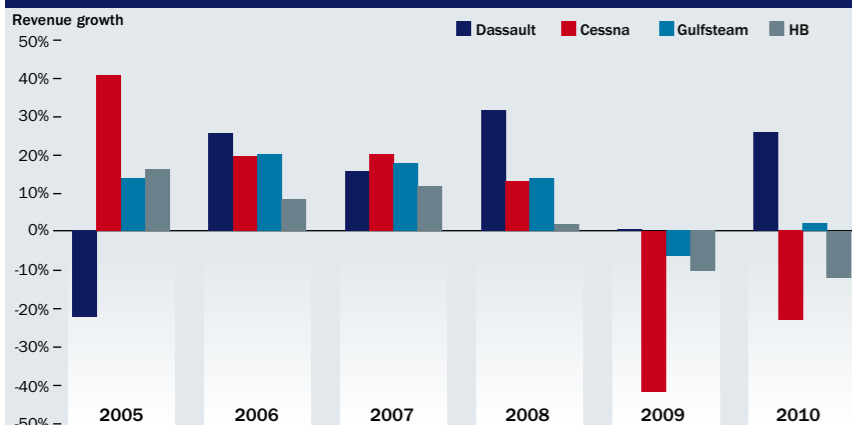
Rank by margin 2010	Rank by margin 2009	Top 100 ranking	Company	Aerospace Sales (2010) \$m	Operating margin (2010)	Operating margin (2009)
1	1	64	TransDigm	828	43.8%	44.0%
2	2	71	FLIR Systems	661	26.1%	30.3%
3	4	28	Precision Castparts	3,572	24.2%	26.1%
4	6	95	Martin-Baker	275	24.1%	22.6%
5	3	96	Garmin	263	23.7%	26.7%
6	5	36	Hindustan Aeronautics	2,843	20.8%	23.5%
7	9	67	Amphenol	782	19.7%	17.3%
8	8	44	Meggitt	1,794	18.9%	20.2%
9	7	62	Chemring	922	18.1%	21.4%
10	10	75	Heico	617	17.7%	16.4%

SOURCE: PwC

**AVERAGE AEROSPACE MARGIN FOR TOP 100 – 2000-10**

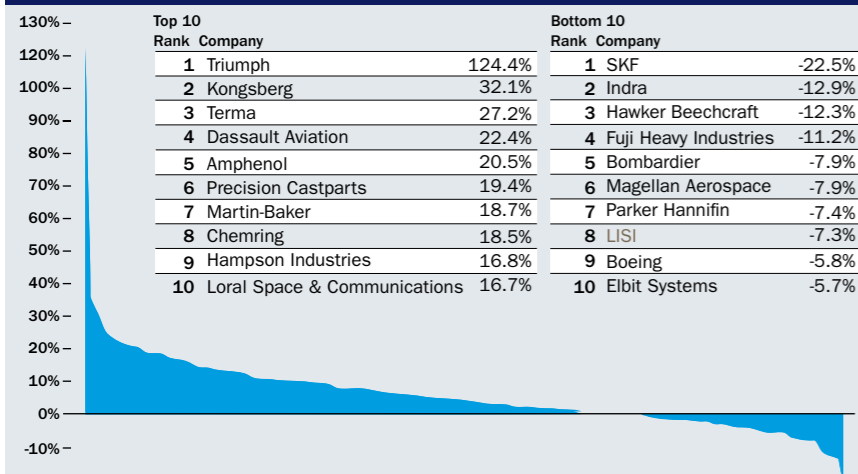


**BUSINESS AIRCRAFT REVENUE GROWTH – 2005-10**



SOURCE: PwC

**AEROSPACE REVENUE GROWTH (LOCAL CURRENCIES)**



SOURCE: PwC

**REVENUE AND PROFIT PROFILE OF TOP 100 – 2010**

Rank	Company	Sales 2010 (\$bn)	Rank	Company	Sales 2010 (\$bn)
1	Boeing	64,306	11	L-3 Communications	15,680
2	EADS	60,608	12	Thales	13,190
3	Lockheed Martin	45,803	13	Safran	12,821
4	General Dynamics	32,466	14	Rolls-Royce	10,875
5	Northrop Grumman	28,038	15	Honeywell	10,683
6	United Technologies	25,227	16	Bombardier	8,614
7	Raytheon	25,183	17	Textron	7,783
8	BAE Systems	23,651	18	Goodrich	6,967
9	Finmeccanica	20,831	19	ITT	6,228
10	General Electric	15,680	20	Dassault Aviation	5,547

NOTE: The average margin of the Top 20 was 9.1% versus 9.4% for the Top 100 overall  
SOURCE: PwC

**TOP 100 BY COMPANY NAME**

Company	Company ranking 2010	Company ranking 2009
Aernnova	82	-
Aeroflex	73	78
Alcoa	34	31
Alliant Techsystems	26	22
Amphenol	67	74
Asco	93	92
Avio	39	37
B/E Aerospace	42	41
BAE Systems	8	8
Ball	70	71
BBA Group	43	46
Boeing	1	1
Bombardier	16	16
CAE	48	50
Chemring	62	68
Circor International	100	-
Cobham	32	33
Crane	78	79
Curtiss-Wright	81	88
Dassault Aviation	20	23
Denel	92	95
Diehl Aerosystems	69	93
Doncasters	94	94
Ducommun	88	89
EADS	2	2
Eaton	49	47
Elbit Systems	38	36
Embraer	22	20
Esterline	50	49
Finmeccanica	9	9
Firth Rixson	79	86
FLIR Systems	71	73
Fuji Heavy Industries	61	58
Garmin	96	98
GenCorp	63	67
General Dynamics	4	4
General Electric	10	10
GKN	41	39
Goodrich	18	18
Hampson Industries	91	96
Harris	23	24
Hawker Beechcraft	37	29
Heico	75	81
Heroux Devtek	90	97
Hexcel	60	65
Hindustan Aeronautics	36	38
Honeywell	15	13
Indra	66	61
Ishikawajima-Harima	31	34
Israel Aerospace Industries	30	35
ITP	74	72

Company	Company ranking 2010	Company ranking 2009
ITT	19	19
JAMCO	84	90
Kaman	85	83
Kawasaki Heavy Industries	40	40
Kongsberg	51	54
Korea Aerospace Industries	56	63
L-3 Communications	11	11
Ladish	89	91
Latecoere	76	76
LISI	86	87
Lockheed Martin	3	3
Loral Space & Comms	54	59
Magellan Aerospace	77	77
Martin-Baker	95	99
Meggitt	44	44
Mitsubishi Heavy Industries	21	21
Moog	58	62
MTU Aero Engines	27	27
Northrop Grumman	5	5
Orbital Sciences	53	53
Panasonic	55	55
Parker Hannifin	45	42
Pilatus	72	80
Precision Castparts	28	32
Raytheon	7	6
Rockwell Collins	24	25
Rolls-Royce	14	14
RUAG	46	48
Saab	29	28
Safran	13	12
Senior	80	84
Singapore Technologies Eng	52	52
SKF	87	82
Sonaca	97	-
Spirit AeroSystems	25	26
Stork	65	66
Teledyne Technologies	47	45
Teleflex	99	-
Terma	98	100
Textron	17	17
Thales	12	15
TransDigm	64	69
Triumph	33	51
Ultra Electronics	57	57
Umeco	83	75
United Technologies	6	7
Volvo	59	56
Woodward Governor	68	70
Zodiac	35	30

SOURCE: PwC

**PROFILE SONACA ALAN DRON**

**BATTLING BACK FROM THE BRINK**

TWO YEARS in the doldrums finally ended for Sonaca in 2010. The recovering aerospace market began to feed through to the Belgian company and its own recovery programme began to bear fruit.

Business volume grew by 15% – better than forecast, although still a substantial 23% down compared with 2008's pre-recession boom. And despite encouraging factors such as an 11% increase in operating income and a 12% rise in productivity there was still a loss – albeit reduced compared with 2009 – of €15.9 million (\$22.6 million).

The Gosselies-based manufacturer specialises in leading edges and slats, with wing and fuselage panels making up most of the remainder of its workload.

Its products are on every member of the Airbus family, including the A400M military transport. This connection will continue into the foreseeable future, with its work on the new

A350 XWB, for which it is designing and manufacturing the slats.

The French connection continues through Dassault, for which it provides slats and fixed wing leading edges for the Falcon 7X.

Sonaca also has a transatlantic component to its work, producing not only slats in Brazil but also fuselage centre section and keel beams for the Embraer E 170/190 family, plus the rear and centre fuselage for the ERJ/Legacy range. Embraer's great rival in the regional market, Canada's Bombardier, is also a customer, with the Belgian company providing leading edges, slats

and de-icing systems. In September 2010, a useful extra piece of work came from another Bombardier division, when Learjet asked it to improve the de-icing system on the Learjet 85, which involved a major redesign.

While Sonaca's position improved in 2010, with reductions in costs coming from a redundancy programme and reduction of stock, some subsidiaries faced fluctuations in their workload, which affected profitability.

Additionally, both the euro and the Brazilian real strengthened against the dollar, which also had adverse effects on the bottom line.

Across all its customer aircraft, Sonaca last year delivered 849 shipsets of components, compared with a high of 1,106 in 2008.

The end of 2010 brought the formation of a new Chinese subsidiary, Elson. Its assembly plant at Tianjin is intended to take advantage of China's lower cost structure. ■

**AT A GLANCE**

- **Top 100 rank** 97
- **HQ** Gosselies, Belgium
- **Aero revenues** \$255m
- **Sales growth** 12.8%
- **Operating margin** -2%
- **ROCE** N/A
- **Employees** 1,403
- **CEO** Bernard Delvaux



Sonaca's deal with Bombardier saw the company working on the Learjet 85

COMMENTARY PWC NEIL HAMPSON

**AN INDUSTRY INNOVATION IMPERATIVE**

THE AEROSPACE and Defence (A&D) industry has been the source of some of the most influential technological advances in modern history – computers and computer networking, satellites and satellite navigation, and important advances in physics – all have their roots in the sector’s research.

That is why there is a strong innovation imperative for the industry.

The aerospace executives interviewed for PwC’s report A&D Insights: Gaining Technological Advantage\* agree. Differentiation has long been critical to gaining and maintaining contracts, programme positioning and market share. It is even more important today given the industry’s increasing globalisation. New competi-

tors are emerging, so maintaining a competitive edge is seen as essential.

That is not the only reason A&D companies are focusing efforts on innovation, despite the economic downturn. Executives also see researching and developing the right new technologies as an essential way to build revenues and cut costs. While a look at the top 20 companies in the sector showed most held R&D spending steady in 2009 and 2010, they may nonetheless find their overall budgets decreasing in future, with reductions in external funding.

So, how do you achieve cost cuts and still make necessary investments in new technologies and new markets? Given the long-term

programmes in place in the sector, it is difficult to make significant changes to the cost structure in mid-stream.

We believe focusing on

**Governments will continue to hold the purse strings**

making the right choices about which markets to pursue is absolutely critical. By expanding into adjacent markets beyond their traditional core, companies can benefit from industry overlap, diversification, new technologies with cross-over applications and making the most of core skill sets. For example, smart grids may represent an extremely promising adja-

cent market. Smart electricity grids offer the potential to significantly reduce grid inefficiency, enable more interactive demand management, better integrate distributed power sources into the grid, change customer experience and facilitate new uses for electric power.

Importantly, they offer A&D companies the opportunity to tap into funding for energy-related projects – and a fast growing global market.

Another strategy is to consider carefully how new technologies can help cut costs (of production or of operation) on existing products or systems. Stronger, lighter, smarter materials are helping airline customers to achieve this, by reducing aircraft weight,

increasing fuel efficiency

and reducing maintenance requirements.

Fibre-reinforced polymer composites are now used in nearly every part of an aircraft. Composite materials account for 50% by weight of the Boeing 787 aerostructures. By reinforcing a plastic matrix with fibres made from glass, carbon or other materials, engineers are able to reduce weight, whilst adding benefits like corrosion resistance. And it’s not just composites; aluminium manufacturers have also been working to develop lighter, stronger alloys with better resistance to heat, cold and fatigue.

Looking further ahead, alongside research to deliver incremental benefits, we can foresee innovations such as self-healing composites.

A&D equipment and systems are maintenance-intensive. Improving technologies that help to monitor aircraft health are becoming increasingly important and hold promise for reducing maintenance costs without compromising safety. One innovative approach to structural health monitoring is to replace traditional fasteners with sensors to test for fatigue cracks in airframes.

That is because cracks most often begin at fastener holes and so, by turning airframe fasteners into sensors, aircraft operators may be able to dramatically reduce the frequency of inspections. The gathering of real-time, health-monitoring data help manufacturers better understand the in-service operation of their

parts and thus design improvements in the future.

A key factor in many of the emerging technologies and adjacent markets identified is that working together with government, within the industry and even beyond sector boundaries, is more important than ever.

Governments will continue to hold the purse strings, not only on military budgets but on some key adjacencies as well. Technological breakthroughs in key areas such as biofuels will require cooperation across the supply chain. Succeeding in some of the most promising new adjacent markets – such as smart grids – will mean co-operating across sector boundaries too.

There is an extremely high



Companies shouldn’t miss opportunities to expand into adjacent markets

level of synergy between new technologies and adjacent markets.

That means companies are likely to get the strongest benefit from their research efforts when new product directions can also help

build a presence in growing adjacent markets. When those efforts align with government priorities, and companies collaborate effectively both within and beyond the industry, the future looks brightest. ■

**For more information, email Neil Hampson, global aerospace and defence leader, at [neil.r.hampson@uk.pwc.com](mailto:neil.r.hampson@uk.pwc.com)**

\*Read the full report at [flightglobal.com/PwCa&D](http://flightglobal.com/PwCa&D)

Rank (09)	Company (country) Division	Aero sales (\$m)			Total sales (\$m)		Operating result (\$m)		Capital employed (\$m)	ROCE		Personnel		Sales per employee (\$)		Comments
		2010	2009	Growth*	2010	2009	2010	2009		2010	2009	2010 headcount	Growth	2010	Growth	
<b>1</b>	<b>(1) Boeing (USA)</b>		64,306	68,281	-5.8%	64,306	4,971	2,096	33,170	15.0%	7.2%	160,500	2.2%	400,660	-7.8%	Three acquisitions in 2010, the largest being Argon ST for \$782 million
		Commercial Airplanes				31,834	3,006	-583								
		Boeing Defense, Space & Security				31,943	2,875	3,299								
		Boeing Military Aircraft				14,238	1,258	1,528								
		Network and Space Systems				9,455	711	839								
		Global Services & Support				8,250	906	932								
		Boeing Capital Corp/other/accounting differences				529	-910	-620								
<b>2</b>	<b>(2) EADS (Netherlands)</b>		60,608	59,544	6.8%	60,608	1,572	-528	52,216	3.0%	-1.0%	121,691	1.8%	498,051	4.9%	Acquisitions include Regency IT Consulting and Jena-Optronik
		Airbus Commercial				36,659	350	505								
		Airbus Military				3,556	25	-2,442								
		Eurocopter				6,398	241	364								
		Cassidian				7,860	596	608								
		Astrium				6,628	370	357								
		Other business (and HQ)				1,604	-9	79								
<b>3</b>	<b>(3) Lockheed Martin (USA)</b>		45,803	43,995	4.1%	45,803	4,097	4,415	23,910	17.1%	18.1%	132,000	-2.9%	346,992	7.3%	IS&GS segment divested Pacific Architects and Engineers (PAE) and most of Enterprise Integration Group (EIG)
		Aeronautics				13,235	1,502	1,577								
		Electronic Systems				14,363	1,712	1,660								
		IS&GS (Information Systems & Global Services)				9,959	890	895								
		Space Systems				8,246	972	972								
<b>4</b>	<b>(4) General Dynamics (USA)</b>		32,466	31,981	1.5%	32,466	3,945	3,675	21,368	18.5%	17.7%	90,000	-1.9%	360,733	3.4%	Three acquisitions in 2010 focused on IS&T and combat systems
		Aerospace				5,299	860	707								
		Combat systems				8,878	1,275	1,262								
		Marine systems				6,677	674	642								
		Information systems and technology				11,612	1,219	1,151								
Corporate					-83	-87										
<b>5</b>	<b>(5) Northrop Grumman (USA)</b>		28,038	27,542	1.8%	34,757	3,070	2,483	23,035	13.3%	10.7%	117,100	-3.0%	296,815	6.1%	Divested advisory services division in 2009
		Aerospace systems				10,910	1,256	1,071								
		Electronic systems				7,613	1,023	969								
		Information systems				8,395	756	624								
		Shipbuilding				6,719	325	299								





Rank (09)	Company (country) Division	Aero sales (\$m)			Total sales (\$m)		Operating result (\$m)		Capital employed (\$m)	ROCE		Personnel		Sales per employee (\$)		Comments
		2010	2009	Growth*	2010	2010	2009	2010		2009	2010 headcount	Growth	2010	Growth		
	Corporate expenses					-156	-129									
<b>19</b>	<b>(18) ITT Corporation (USA)</b>				17,619	3,304	3,923									
	Technology infrastructure – aviation	6,228	6,355	-2.0%	10,995	900	894	9,693	9.3%	10.5%	40,000	-0.5%	274,875	3.5%		
	Fluid technology				3,670	479	393									
	Defence electronics and services				5,897	752	761									
	Motion and flow control				1,441	179	118									
	Eliminations				-13	-510	-378									
<b>20</b>	<b>(23) Dassault Aviation (France)</b>	5,547	4,757	22.4%	5,547	783	592	6,185	12.7%	8.8%	11,551	-5.4%	480,182	29.4%		
	Defence				1,270											
	Falcon (executive jets)				4,276											
<b>21</b>	<b>(21) Mitsubishi Heavy Industries (Japan)</b>	5,376	5,343	-5.6%	33,061	1,152	701	27,951	4.1%	2.4%						
	Aerospace				5,376	-39	-68									
<b>22</b>	<b>(20) Embraer (Brazil)</b>	5,364	5,498	-2.4%	5,364	392	379	6,002	6.5%	6.2%	18,884	12.1%	284,050	-12.9%		
	Commercial aviation				2,889	241	118									
	Defence				670	90	57									
	Executive aviation				1,145	59	96									
	Aviation services				564	13	97									
	Others				97	-11	12									
<b>23</b>	<b>(24) Harris (USA)</b>	4,755	4,470	6.4%	5,206	913	794	3,692	24.7%	23.6%	15,800	2.6%	329,500	1.4%		
	RF communications				2,067	707	572									
	Government communications systems				2,688	337	303									
<b>24</b>	<b>(25) Rockwell Collins (USA)</b>	4,665	4,470	4.4%	4,665	822	885	3,612	22.8%	26.9%	20,000	3.6%	233,250	0.7%		
	Government systems				2,861	606	602									
	Commercial systems				1,804	293	353									
<b>25</b>	<b>(26) Spirit AeroSystems (USA)</b>	4,172	4,079	2.3%	4,172	357	303	3,937	9.1%	8.7%	12,589	-7.5%	331,400	10.6%		
	Fuselage systems				2,035	292	288									
	Propulsion systems				1,062	138	123									
	Wing systems				1,067	101	21									
	All other				8	-2	-1									
	Unallocated corporate and R&D					-172	-126									
<b>26</b>	<b>(22) Alliant Techsystems (USA)</b>	3,913	4,046	-3.3%	4,842	526	512	3,381	15.6%	16.6%	15,000	-16.7%	322,800	20.8%		
	Aerospace systems				1,433	131	145									
	Armament systems				1,806	212	168									
	Missile systems				674	69	59									
	Security and sporting				930	128	108									
	Corporate					-14	32									
<b>27</b>	<b>(27) MTU Aero Engines (Germany)</b>	3,586	3,630	3.7%	3,586	355	343	2,538	14.0%	13.6%	7,907	3.2%	453,522	0.5%		
	OEM: commercial and military				2,204											
	MRO: commercial maintenance				1,423											
	Other consolidated entities				-40											
<b>28</b>	<b>(32) Precision Castparts (USA)</b>	3,572	2,991	19.4%	6,220	1,503	1,423	8,014	18.8%	21.0%	18,308	1.1%	339,742	12.6%		
	Aerospace				3,572											
<b>29</b>	<b>(28) Saab (Sweden)</b>	3,389	3,221	-0.9%	3,389	135	180	-14,527	-0.9%	9.1%	12,536	-4.7%	270,354	4.1%		
	Aeronautics				899	26	1									
	Dynamics				645	45	35									
	Defence electronics				467	14	3									
	Security and defence				844	19	36									
	Support and services				428	49	54									
	Corporate				107	-17	51									
	Eliminations															
<b>30</b>	<b>(35) Israel Aerospace Industries (Israel)</b>	3,148	2,881	9.3%	3,148			374	0.0%	0.0%						
<b>31</b>	<b>(34) Ishikawajima-Harima (Japan)</b>	3,064	2,957	-2.8%	13,518	699	504	7,632	9.2%	7.2%						
	Aero-Engines & Space Operations				3,064	66	75									
<b>32</b>	<b>(33) Cobham (UK)</b>	2,939	2,932	1.2%	2,939	355	448	5,249	6.8%	18.7%	11,636	-3.4%	252,562	4.8%		
	Avionics and surveillance				690											
	Defence electronics				1,327											
	Mission systems				531											
	Aviation services				423											
	Other activities				0											
	Intercorporate				-34											
<b>33</b>	<b>(51) Triumph (USA)</b>	2,905	1,295	124.4%	2,905	314	155	3,507	9.0%	11.0%	12,097	101.9%	240,142	11.1%	Acquired Vought Aircraft Industries in June 2010	





