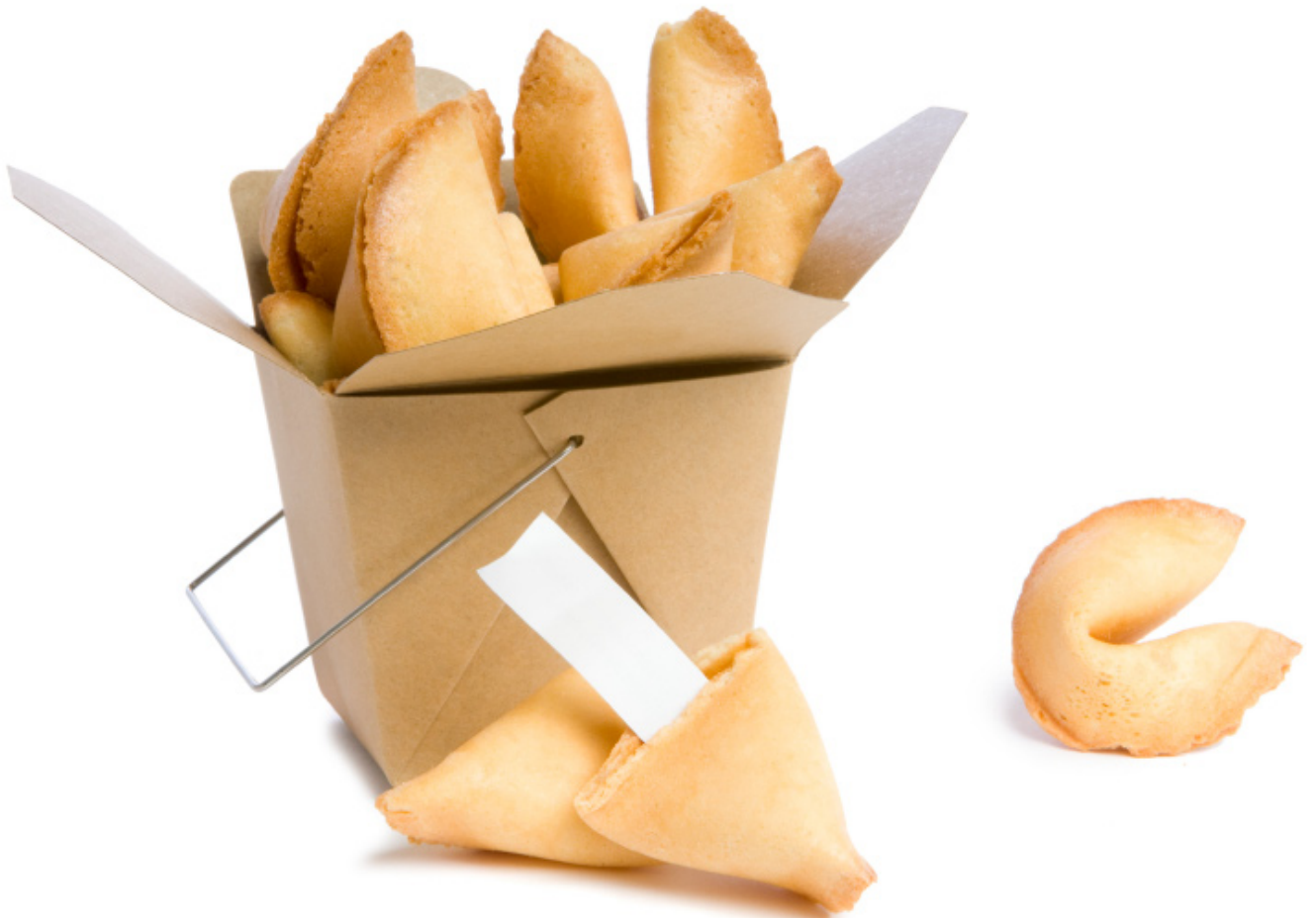


2009 Industry Outlook: Aerospace & Defense Challenging Times, Emerging Opportunities



Aerospace & Defense



After a six year run of improving performance, resulting in a composite industry share price performance approximately three times better than the S&P 500 index, the U.S. Aerospace & Defense (A&D) industry finds itself in transition and facing uncertainty and, perhaps, leaner times ahead. With the election of a new U.S. President, there is an expectation of future troop pullouts from Iraq, deployments to Afghanistan, reduced defense procurements, increased NASA funding and more military acquisition oversight.

The defense sector should be somewhat buffered from the nation's late-2008 economic crisis in the short term. U.S. defense spending has climbed over 60 percent during the Bush administration, and will total at least \$612.5 billion in fiscal 2009, including \$542.5 billion for the basic defense budget and \$70 billion for the wars in Iraq and Afghanistan.¹ However, we expect future Department of Defense (DoD) budgets to – at best – flatten out and more

likely decrease, due to expected slowdowns of military action in Iraq, coupled with expectations for Congress to squeeze the DoD budget in response to increasing federal deficits, the cost of the Wall Street bailout, domestic priorities and slowing U.S. GDP growth. These drivers may well impact U.S. defense programs and associated budgets in 2010 and beyond. In some cases, there may be calls to cut current weapons procurements and to eliminate certain development programs altogether. Despite this uncertainty, U.S. defense contractors' financial performance likely will be better than their European counterparts in 2009, due to continued – although somewhat easing – foreign exchange differentials, program delivery challenges and European job protection policies.

The large commercial aircraft sector is expected to generate most of its revenue from Asia Pacific Japan (APJ) and the Middle East, relying less on U.S. orders due to the current economic climate. In the next two decades, Boeing forecasts delivery of 29,400 new commercial aircraft worth \$3.2 trillion.² In the short term, however, airline companies worldwide will continue to struggle with the global economic recession, fuel price fluctuations and the difficulty in raising ticket prices, which might impact airplane and engine purchase orders in 2009. Fortunately, the multi-year backlog for airplane production at the major commercial aircraft companies appears to be solid, with expected 2009 deliveries on the order of 900 large commercial airplanes.³

Business aviation forecasts for the coming decade are quite robust: Honeywell's 2008 forecast predicts 17,000 new business aircraft valued at \$300 billion.⁴ Because of the global credit squeeze, however, there may be short-term customer financing challenges for some portion of the backlog for business jets. Thus, we would expect that 2009 may see a falloff in business jet orders, production and deliveries.

1 Shalal-Esa, Andrea, "U.S. defense market seen facing rising protectionism," Reuters: http://www.forbes.com/reuters/feeds/reuters/2008/11/03/2008-11-03T222104Z_01_N03353407_RTRIDST_0_USA-WEAPONS-PROTECTIONISM-ANALYSIS.html
2 2008 Boeing Current Market Outlook

3 Boeing and Airbus Quarterly Financial Forecasts

4 "Honeywell's profit up on higher sales," CNNMoney.com, http://money.cnn.com/2008/10/17/news/companies/honeywell_earnings.ap/

Need for additional revenue sources

With core defense spending expected to slow, U.S. defense contractors need to identify additional revenue sources for the coming years. 2009 should see some interesting M&A activity, mostly smaller deals by larger A&D firms to fill in capability gaps – particularly in the security, defense electronics and aftermarket services business areas. European companies could use high-value euros to buy undervalued U.S. assets. U.S. defense firms may see opportunities in credit-squeezed markets to pick up U.S. assets at historically low price earning multiples. Some large companies are expanding into the adjacent markets of mission support and services, such as performance-based logistics, or PBL, which can provide a more consistent, albeit riskier, and perhaps more profitable, revenue stream.

Building on the example set by engine companies – Pratt & Whitney and Rolls-Royce get 50 percent of revenues and 60 percent of profits from their services business⁵ – A&D contractors are learning how to take on, measure and internalize risk and to make support and services offerings profitable. This includes understanding how to service the equipment they manufacture, and assembling the necessary infrastructure, capabilities and people to operate it. Companies are also leveraging strong balance sheets to grow organically and acquire new services business. As product development transitions to production program deliveries, it is anticipated that companies will ramp up their services businesses and profitability should improve.

Program management and execution challenges

A major A&D sector challenge for 2009 is improving program management and execution. For the past few years, commercial aircraft programs have run late due to global supply chain or design problems. In addition, government aerospace procurements have overrun their budgets. A March 2008 Government Accountability Office (GAO) report evaluated 95 weapons systems programs and found their R&D activities were over budget by an average

of 40 percent. Total budget overruns for the programs were \$295 billion – up from \$42 billion for a similar study conducted seven years earlier. Acquisition costs were over budget by an average of 26 percent, and the average schedule delay was 21 months. Only one-third of programs were on schedule.⁶ This track record of poor performance is alarming, and the trend line appears to be getting worse.

The DoD may be the focus of the GAO's report, but the problem of delays and cost overruns knows no country boundaries and affects commercial as well as military procurements. Program management and execution in the A&D industry is becoming a critical issue. The U.S. government is responding with increased scrutiny of program cost overruns, including Senate Armed Services Committee hearings and proposals for additional oversight.

We have found that root causes for the problem can be grouped into five major categories, all of which should be focus areas for A&D executives in 2009:

- **Technical complexity** – Today's A&D programs rely on the use of leading-edge, still-maturing software-based technologies, which require infinitely higher levels of functionality, interoperability and integration. This technical complexity has resulted in increased development time versus historical programs. As an example, the Manhattan Project (1945) took 2.5 years from contractor start to first use. A recent fighter jet program (2005), in contrast, took 14 years from contractor start to first use, and is now 30 percent over budget. Industry and government have a shared role in resolving the issues around technical complexity. Potential solutions include dividing programs into less-complex work packages and shorter program lengths; delaying approval of systems development and demonstration (SDD) contracts until the underlying technology is proven; and developing budgets that reflect technical complexity risk with realistic, not optimistic assumptions.

5 2007 United Technologies Corporation Annual Report; 2007 Rolls-Royce Annual Report

6 GAO Report to Congressional Committees (GAO-08-467SP), "Defense Acquisitions: Assessments of Selected Weapon Programs," March 2008

- **Talent crisis** – Twenty-seven percent of A&D employees will be eligible for retirement in the next five years.⁷ In addition, the National Science Foundation expects the number of science, technology and engineering (ST&E) retirements to increase threefold annually in the next 10 years.⁸ Unfortunately, the A&D industry may not be able to attract sufficient new talent to make up the deficit. A lower percentage of U.S. college students are pursuing ST&E degrees, and even though China and India are producing large numbers of engineering graduates, foreign nationals are not permitted by law to hold U.S. defense jobs. Additionally, A&D companies are facing rising competition for ST&E talent from other industries, such as high technology. In response, defense contractors and the DoD are employing tactics such as creating financial incentives to retain “Baby Boomer” engineers and technicians and their much-needed experience; promoting math and science among middle- and high-school students; and modernizing their Human Resources (HR) programs to balance compensation, benefits, career, and work issues.
- **Supply chain challenges** – The A&D supply chain management model is transitioning to a global, super-supplier model for the Tier 1 suppliers and original equipment manufacturers (OEMs). These organizations are shedding manufacturing and subsystem assembly work, relying on super- or middle-tier suppliers to take on increasingly complex design and manufacturing tasks. This business model shift has experienced growing pains, which has resulted in manufacturing delays. To address the problem, the industry is taking steps to streamline supply chains and realize efficiency gains to better manage program performance. For example, some OEMs are identifying key suppliers and building collaborative, risk-sharing relationships as opposed to the more traditional, arm’s-length transactional model.
- **Politics** – A&D programs span multiple years but are budgeted annually. In times of economic stress, other government priorities may prompt cuts in multi-year projects in the form of number of units. This approach typically results in increased fly-away unit costs. As evidenced by the recent Senate Armed Services

Committee hearings, Pentagon auditor initiatives, and other regulatory activities, A&D contractors can expect to see heightened oversight by Congress, resulting in greater accountability in contracting and increased rules on disclosure of overpayment and fraud. Indeed, there are calls for peer reviews for programs exceeding \$1 billion in costs, which will provide a higher level of risk mitigation around costs and schedule performance.

- **Program management challenges** – Many A&D program schedules are based on a “sunny day” scenario, rather than a more realistic “cloudy day” scenario that contemplates program delays, technical difficulties, supply chain problems and changing requirements. These program management challenges and associated cost overruns need to be addressed by improving cost, schedule, and risk management processes and techniques. Competitions for programs need to generate realistic estimates for design and manufacturing products, including adequate contingency time for unanticipated technical complexities, testing difficulties and unforeseen uncertainties during the development and production life cycle. Also, the government should rely more on fixed-price contracts with strong change order management processes. Cost-plus development contracts should be evaluated more on budget, schedule, risk management and scope control and less on low-bid criteria.

Promoting innovation

Commercial aircraft production began as a unique business that had premium value – and pricing. As passenger traffic has increased and competitors have entered the market, however, commercial airplanes have become more commoditized, requiring companies to improve differentiation. To make money in 2009 and beyond, aircraft manufacturers not only must continue to relentlessly chase the cross-curve, they must promote product and process innovation. The new Boeing 787 Dreamliner is a good example: It will be the first major aircraft to use composite materials for most of its construction. Featuring an estimated 20 percent lower direct operating cost, better passenger comfort via higher

7 U.S. Congress, Interagency Aerospace Revitalization Task Force, Public Law 109-420—Dec. 20, 2006

8 National Science Foundation, “Science and Engineering Workforce,” 2002

air pressure and humidity, larger windows, and less-frequent maintenance requirements, the 787 has become the most successful aircraft product launch in aviation history, as measured by number of aircraft ordered prior to first flight.

The challenge for the airline industry is to ease the growing pains of product and process innovation to realize the potential for technology advances. For example, aerospace process innovation will need to continue attacking structural cost reduction opportunities via industry-wide implementation of digital product definition tools and processes, as well as outsourcing parts manufacturing to lower-cost countries.

A year of transition

2009 will be a year of A&D industry transition marked by the inauguration of a new U.S. president, expectations that the Iraq war will begin to wind down, uncertainty and staggering losses among airlines caused by fuel price swings, the introduction of new regional jets from Russia, China and Japan, unprecedented levels of U.S. DoD source selection protests, and the expected beginning of Boeing 787 Dreamliner deliveries. Also, the world continues to be a dangerous place, and events such as the Russian invasion of Georgia, nuclearization of Iran and North Korea, or an unforeseen, large-scale terrorist event could impact the industry at any time.

In this tough economic environment, A&D customers – both government and commercial – will be forced to set priorities and make difficult trade-offs about what programs they can really afford. This will likely produce more intense competition for fewer but larger awards, potentially leading to more award protests. In addition, the government is moving from a cost-plus to a fixed-price procurement environment to reduce spend and obtain more value, which will place more risk on contractors' shoulders.

Fortunately, the A&D sector is better-positioned to weather an economic crisis than other industries. Defense contractors have significantly improved their balance sheet strength with several years of debt reduction and stock buybacks. Spend from the U.S. DoD is multi-year and 2009's budget is already set. Boeing & Airbus's order backlog is six years long, with little exposure to financially challenged U.S. airlines.⁹ Commercial airline order backlogs from China and the Middle East are robust and appear to be solid. By focusing on product innovation, process improvements and new revenue opportunities, A&D companies will be well-positioned to take advantage of an economic turnaround.

⁹ Vandore, Emma, "Boeing, Airbus Struggle To Meet Demand", Associated Press, Manufacturing.Net

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