



## INDUSTRY BRIEF

# Adapting Your Supply Chain to New Realities in Aerospace and Defense

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## IN THIS INDUSTRY BRIEF

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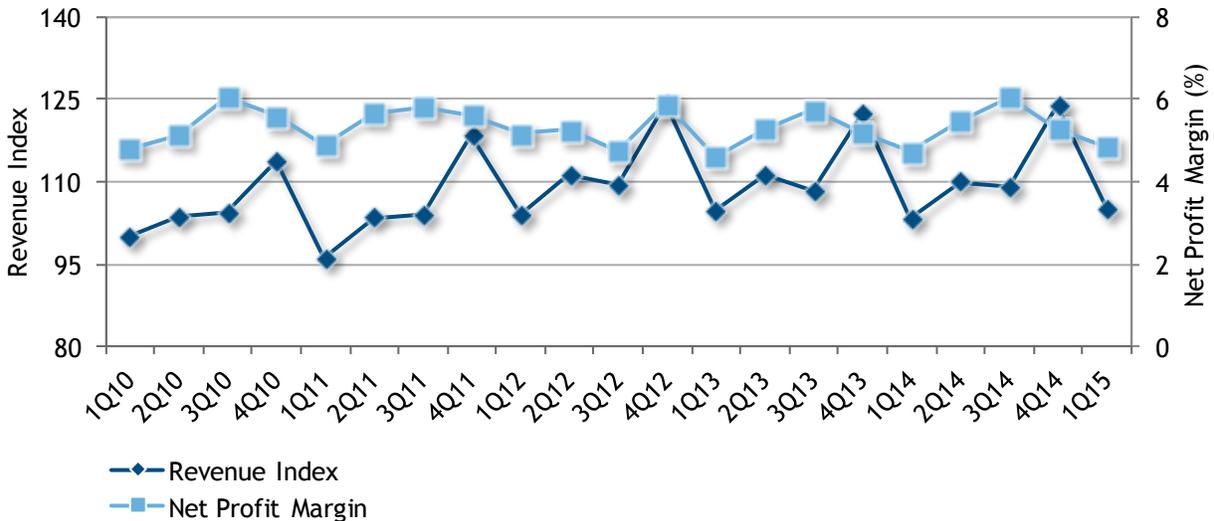
In this Industry Brief, IDC Manufacturing Insights discusses the state of the aerospace and defense (A&D) industry and how market trends are reshaping business models. These changing business models demand new levels of competency in logistics and supply chain management, especially in the compliance-intensive context of today's A&D market. The document concludes by discussing how leading companies are not taking on this challenge themselves but are partnering with external providers that can supply the requisite skills and industry knowledge needed to be successful.

### Current Situation

The A&D industry has enjoyed steady revenue gains and solid profitability over the past five years (see Figure 1). The defense side of the industry has experienced a bit more volatility as the United States (easily the largest single buyer) has shifted priorities, as active conflicts have diminished and approaches to combat and security have changed. The commercial side, however, has been on a steady march, interrupted only by delays in ramping up new platforms to production rates. Backlog, which is the key harbinger of future revenue growth, is very healthy, with 2014 already setting records for new orders (nearly \$100 billion in July alone).

**FIGURE 1**

**A&D Revenue and Profit Trends, 2010-2015**



**Notes:**

The revenue index for 1Q10 equals 100.

IDC Manufacturing Insights' Global Performance Index (GPI) tracks growth metrics from 800+ publicly traded global firms in the manufacturing and retail industries.

Source: IDC Manufacturing Insights' Global Performance Index, 2014

Steady profitable growth doesn't mean the industry is in stasis. On the contrary, three major industry trends are substantially reshaping the value chain and permanently transforming business models.

### The Importance of Emerging Markets

Much of the backlog is coming from orders originating in countries that have enjoyed robust growth and are building out a competitive air traffic network. China, in particular, is projected to become the largest market for aircraft, with more than a dozen carriers expected to hold at least 100 aircraft in their fleets by the end of the decade.

New markets have also had an impact on the defense segment. The export of weapons platforms is seen not just as a way to distribute development costs but also as a way to mitigate trade imbalances. For example, the combined export of both commercial and military aircraft added up to over \$71 billion in trade surplus for the United States in 2012. While this activity draws government support, it also raises security concerns regarding the distribution of advanced technology and heightens the oversight around export control.

The emerging market trend is having a huge influence on the structure of the industry. On the production side, most governments insist on production offsets to create jobs within the country. This requirement means aircraft original equipment manufacturers (OEMs) must set up operations in remote areas and ensure that component parts reach the factories.

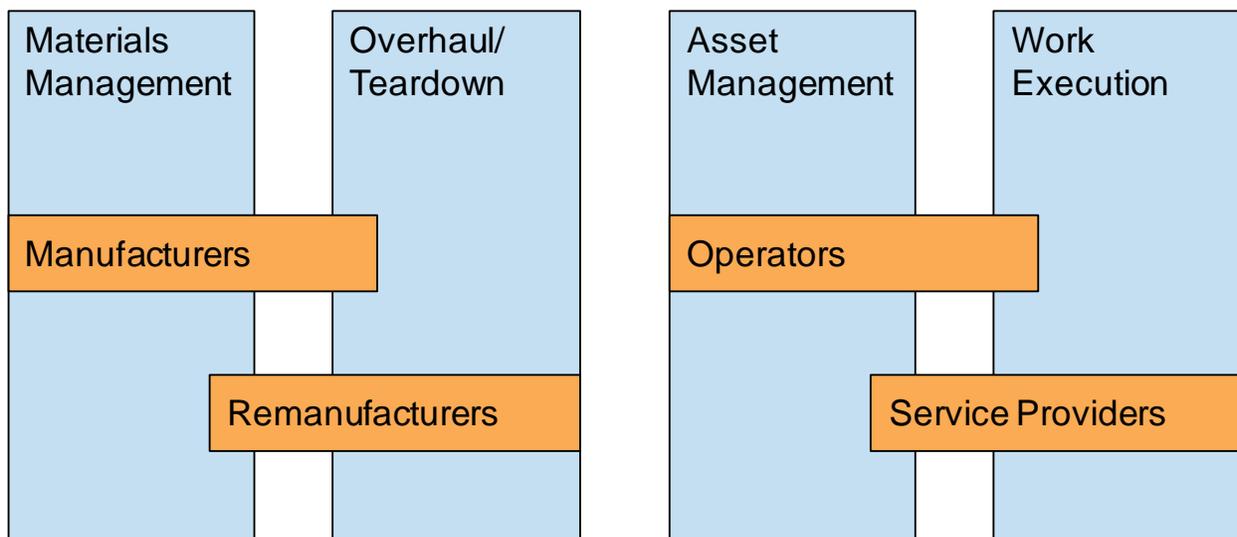
Perhaps even more instrumental is globalization's effect on maintenance, repair, and overhaul (MRO) activities. For the most part, MRO must happen where the aircraft sits. Given the increase in the global distribution of fleets, companies involved in maintenance must deal with several challenges, including inexperienced workforces, immature logistic networks, and regulatory oversight.

## The Importance of MRO Services

While the sale of new aircraft is enjoying unprecedented growth, operators are not simply modernizing their fleets. The aforementioned growth in emerging markets is adding to the overall deployed fleet, and the number of aircraft coming out of service is relatively modest. This situation means that another important element of industry revenue growth, and perhaps even more so of healthy profitability, is the MRO market. This market has been traditionally separated along the lines illustrated in Figure 2, with OEMs supplying parts (and expertise) and remanufacturers doing major overhauls. The operators take care of asset management and shared actual maintenance execution with independent service organizations (ISOs).

**FIGURE 2**

### Traditional A&D MRO Value Structure



Source: IDC Manufacturing Insights, 2014

However, the lines of the traditional structure are blurring as aerospace manufacturers look to capture a larger share of both the depot-based overhaul activity and the flight line-level repair and preventive maintenance. Even in the defense industry, where there are explicit rules about how much maintenance must be performed by the military, public/private partnerships are being formed to allow civilian contractors to more actively participate in the process.

A substantial driver of both commercial and defense MRO transformation is the emergence of performance-based contracts. Under this type of contract, the OEM realizes revenue by the hours of operation rather than for the aircraft at acquisition, pushing the responsibility for keeping the aircraft operating onto the manufacturer. The practice was pioneered by the engine manufacturers that have had "power by the hour" arrangements for over a decade now.

The MRO value chain is being reshaped by these developments. A&D companies are not only replenishing spares but also taking on the responsibility for getting parts (or full work order kits including several parts and tools) to the aircraft in need. The complexity of this endeavor is magnified by the globalization trend discussed previously. On the supply side, Mexico has become a hub for parts manufacturing, and on the demand side, the fleet is more globally distributed. In conjunction, optimizing fulfillment while minimizing costs and working capital has become an industry priority.

## The Compliance Challenge

Another factor in reshaping the A&D value chain is compliance. The industry, especially the defense segment, is not new to regulatory oversight. However, when the compliance challenge is combined with the globalization and service consolidation trends, the equation becomes more complex. Furthermore, layers of compliance beyond the regulatory exist, namely industry standards and corporate policies.

### *Regulatory Statutes*

The defense segment has had to be diligent about ensuring that technology critical to weaponry stays out of the hands of hostile nations. As such, International Traffic in Arms Regulations (ITAR) must be followed. Companies must comply by making sure that material classifications are correct and export licenses are intact. The Department of Defense and its foreign equivalents have acquisition, quality, and contract regulations that fill volumes. Possibly, most significant to the supply chain are the requirements for parts identification through the Universal Identification (UID, MIL-STD-130) process, which requires that certain components be tagged with a serialized number so that they can be tracked through the supply chain.

Increasing globalization has also opened the industry up to a host of other trade-related regulations such as the Customs-Trade Partnership Against Terrorism (C-TPAT), which introduces controls on parts movement to ensure security and prevent terrorist activity. Once the security audits are satisfied, companies must continuously manage the Mutual Recognition Agreements (MRAs – written understandings of trade processes between country pairs) and ensure compliance. Regulatory vehicles intended to streamline processes, such as the Automated Export System, reduce customs review time by automating the exchange of information.

## ***Industry Standards***

In the defense segment, standards are set through regulations. The Federal Acquisition Regulation (FAR) essentially governs how A&D contractors bid on, deliver, and service aircraft and otherwise meet quality requirements. In the commercial sector, however, certain standards, while not obligatory, are accepted as prerequisites for doing business in the industry. Some of these standards are managed through industry consortia (RFID marking standards managed by Boeing and Airbus), industry standards groups (SAE for material standards), and cross-industry groups (ISO for quality standards).

Although technically optional, most of these standards are obligatory for participation in the A&D marketplace. With increasing globalization and product complexity, standards provide a measure of assurance that removes friction from global trade.

## ***Corporate Policies***

The final layer of compliance relates to corporate policies. For example, the majority of companies in the industry have continuous improvement programs, largely lean manufacturing and Six Sigma centric. Increasingly, companies are looking to extend these principles to their supply chain operations, where according to IDC Manufacturing Insights' estimates, more than \$36 billion in coordination waste exists across the tiers in the A&D industry. Coordination waste is an umbrella term that encompasses all the lost time, excess inventory, and costs related to the exchange of information needed to coordinate supply chain activity. Other corporate policies extend legal requirements such as protocols for how the company engages foreign officials.

The other corporate policies to factor into the compliance equation are those of external constituents – suppliers and customers. Customers may have specific requirements for information such as certificates of compliance for the material being supplied. It is also increasingly common for customers to insist on the sharing of automated data about the status of goods being delivered from Electronic Data Interchange (EDI) documents to real-time feeds.

## ***Compliance Requires Managing the Flow of Goods and Information***

The traditional definition of supply chain is the management of information, goods, and money from source to delivery. All three levels of compliance add complexity to this process, especially to the management of information. Information management remains underdeveloped in the industry and is a root cause of the aforementioned more than \$36 billion of coordination waste. Supply chain competency in this area not only will help companies avoid penalties (and keep executives out of court) related to compliance but also has the potential to contribute to substantially improved profit performance.

## Future Outlook: The Resilient A&D Supply Chain

In an editorial published in June 2005 by *Aviation Week* magazine, the writer called on the industry to improve its performance, calling out the supply chain specifically:

In point of fact, supply chain management is one of the variables that has a huge bearing on how individual contractors perform and over which they have direct control. But ironically, it may be the industry's weakest link.

In the nearly 10 years since that editorial, the industry has improved its capability, but the trends discussed in this document have accelerated in complexity at a faster rate than the improvements have been implemented. This widening gap is particularly evident in MRO activities where the manufacturer's desire to assume a larger role requires a new level of competency. The good news is that there is a tremendous opportunity to drive significant value chain benefits, as maintenance is the second-largest expense for operators (after fuel) and there is plenty of waste to be eliminated.

IDC Manufacturing Insights has proposed a strategic approach to articulate the required MRO supply chain capabilities that emphasizes the notion of resiliency. The academic definition of resiliency (and there is an academic discipline called resiliency that focuses on large-scale systems such as ecological or economic systems) is *the ability to adapt to changing circumstances while maintaining a central purpose*. Resiliency is crucial to the mission statement of an A&D company's MRO supply chain operations – keeping up with globalization and changing compliance requirements (the ability to adapt) while keeping aircraft flying, passengers safe, and the company profitable (maintaining the central purpose).

The academic work also identifies a number of characteristics of a resilient system, two of which are most relevant to this discussion. A resilient system is simple at the core and diverse at the edges. Similarly, A&D companies need to have a consistent, standard (or simple) set of supply chain processes, with the ability to adapt those processes to a particular operating theater (diverse at the edge). Another characteristic is that systems that demonstrate greater resiliency have tight feedback mechanisms – an affirmation of the importance of managing information, not just for compliance but for improved decision making as well.

This widening supply chain capability gap and the need for building a resilient strategy beg the questions – What does an A&D company need to do, and how does it get done quickly and efficiently? IDC Manufacturing Insights recommends that companies create a corporate position on what resiliency means for their specific circumstance. To integrate those capabilities quickly, they should consider a third-party supply chain services partner.

## Essential Guidance

Selecting a partner to support MRO supply chain activities, in the context of a strong corporate vision, will be critical to closing the capability gap, improving profitability through waste reduction, and increasing revenue by demonstrating a solid execution competency. IDC Manufacturing Insights has identified four critical criteria to consider in the selection.

## *Geographic Coverage*

While this should be intuitively obvious given the impact of globalization, all providers of supply chain services are not created equal. Potential partners should have as much physical presence as possible in the countries where they are doing business, not simply independent agents listed on a roster. Furthermore, the ability to track information as goods move across regions is important, particularly in this industry where chain of custody has implications on several regulatory compliance levels.

## *Process Coverage*

IDC Manufacturing Insights recommends favoring a partner that can bring a full range of integrated processes rather than trying to manage a portfolio of specialists. The process coverage ideally would include:

- **Transportation.** The baseline logistics management capability to ensure that parts are delivered on time to the right location
- **Warehousing.** The ability to offer bonded storage of goods
- **Global trade.** Encompassing freight forwarding and customs paperwork
- **Kitting/consolidating.** The ability to put kits of parts (and associated paperwork) together in preparation for delivery (This offering should include "merge in transit" capabilities.)
- **Monitoring.** The partner's ability to provide full visibility into activity; a supply chain control tower to use industry parlance
- **Reporting.** The service provider's ability to compile and file the necessary regulatory reports

A critical consideration for selection will be the ability of the provider to perform these processes in a compliant manner including regulatory, industry, and company standards. A provider with a full range of services will ease the relationship and provide a much more integrated management of the flow of both material and information.

## *Industry Experience*

The A&D industry has very specific approaches to how business is conducted and, perhaps more than any other industry segment, a unique vernacular. It is important that the provider can bring a track record of working effectively in the industry. Providers that have assets of their own, especially aircraft, may be the best place to start.

## *Relationship Management*

Outsourcing supply chain process is a delegation, not an abdication. The selection is only the beginning; making sure the partnership works at a strategic level is the most critical success factor. Look for a provider that can provide references that can speak to effective program management. A particularly good sign is when the provider has a joint supply chain business plan written in collaboration with the customer.

An industry in transformation like A&D represents a tremendous opportunity. The growing complexity resulting from globalization, MRO service convergence, and compliance translates to new expectations for supply chain performance. Taking advantage of an experienced partner allows an A&D company to focus on strategy, fuel new required capabilities, and achieve the resiliency necessary to sustain success.

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