

# Manufacturing Business Technology

## Aerospace & Defense Sector Gears Up for Increased Spending and Scrutiny

*By Tom Hennessey*

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Even before the official start to the Trump administration, A&D manufacturers began to see signs of a sea change in military spending. Both Trump and John McCain, chairman of the Senate Armed Services Committee, announced plans to drastically increase the defense budget over the next several years. In November, [Forbes](#) claimed that the newly elected President was likely to increase overall military spending by as much as \$1 trillion over ten years. During his campaign, Trump called for 90,000 more Army soliders, a 350-ship Navy (including more aircraft carriers and attack submarines), 100 more aircraft fighters, and a strengthened nuclear defense. McCain's plan, announced in a whitepaper entitled "Restoring American Power" called for a [\\$54 billion increase](#) to the Defense Department's base budget for 2018, citing global competition and rising terrorist threats.

### **Demand and Budgets Increase in U.S. and Overseas**

Manufacturers in the space have reason to be optimistic that growth, sluggish in recent years, will pick up steam. The [markets confirmed the promising outlook](#), as A&D funds and major company stocks ran up to record highs immediately following the election. A Republican-controlled Congress and vocally pro-military President should be able to end budget sequestration and increase spending without much pushback.

Moreover, [international demand](#) for aircraft, missiles and other military craft continues to increase. The Middle East, Japan, South Korea and India are ramping up defense spending in response to growing threats. European countries' unease with Trump's anti-NATO (and pro-Russia) rhetoric has compelled Germany and other nations to [increase their military budgets](#).

### **No Easy Money**

However, A&D manufacturers should expect challenges along the way. Trump has already made it clear that he will not hesitate to publicly excoriate manufacturers in an effort to force cheaper deals and create jobs for U.S. workers. His public name-and-shame negotiations with automakers are just the beginning. Trump's harsh criticism of Boeing's Air Force One and Lockheed's F-35 projects should put A&D players on notice: cost-cutting concessions will be part of any new or ongoing contracts. After a mid-January meeting with Trump, Boeing's CEO Dennis Muilenburg reported that they had discussed plans to streamline and simplify processes in order to reach "substantial cost reductions." Likewise, McCain has long history of [calling out wasteful Pentagon spending](#), most [recently targeting](#) the Navy's Littoral Combat Ship failures.

Trump's voting base, especially in struggling Rust Belt states, was energized by his promises to bring back manufacturing jobs to the U.S. and strengthen the military, but also by his crusade against big government and politics-as-usual. In order to make good on his pledges, he will have to push defense contractors to do more with less. Cost overruns, project delays and failure to execute may lead to damaging public reprimands and tighter government purse strings. Pressure to bring component manufacturing back to US factories will require manufacturers to retool plants and retrain workers, both of which will strain resources and cut into profit margins.

## **Rising to the Challenge**

The challenge for the A&D industry is two-fold: prepare to secure a piece of increased funding and projects, and get ready to execute those contracts expeditiously under heightened scrutiny on costs, quality and compliance.

Manufacturers can gear up for these challenges by embracing smart manufacturing approaches. Supported by information technology and digital manufacturing firms, A&D companies need to build up their capabilities in Big Data and advanced analytics, robotics and automation, cyber-physical integration and global supply chain management. To optimize the complex discrete manufacturing of highly engineered military hardware, enterprises must implement and integrate MES and other smart manufacturing solutions throughout the value chain.

## **Smart Manufacturing Transformation**

Software, Big Data and IIoT are the main drivers of the sector's transformation to Industry 4.0. Advanced analytics and data-driven production processes can boost productivity up to 30 percent while cutting product development and assembly costs in half. Data-driven decision making processes also reduce capital costs, streamline change management and increase quality. Big Data imbues lean manufacturing models with powerful, precise insights into eliminating wasteful activities and maximizing efficiency.

A&D manufacturers can transform product development by leveraging sensor data from products, machines, and monitoring systems to create simulations, enabling performance analysis even before physical prototypes are created. Cyber-physical systems monitor processes and automate decision-making about inventory, logistics, maintenance and much more. Over the IoT, cyber-physical systems communicate with each other and with human operators, enabling internal and cross-organizational services that coordinate and support participants in the value chain. In an era when globalization is increasingly suspect (or hampered by geopolitics), supply chain visibility and accountability are paramount, especially for highly sensitive and elaborate machines like fighter jets.

## **Quality and Accountability**

A&D companies require Closed-Loop Quality processes that permeate the enterprise and supplier networks. Traceability is especially critical in A&D manufacturing. Smart manufacturing systems provide strong control and visibility over lot and serial tracked parts from cradle to grave. In a fully integrated digital manufacturing enterprise, data gathered from initial design through to MRO forms a digital thread. Materials, components, subassemblies, units and completed products are traceable at granular levels, and can be queried to test quality, prove compliance and streamline changes and recalls.

MES, operations and quality management solutions bridge gaps between engineering and business systems, enabling real-time statistical process control, documentation of root cause analysis and corrective action procedures, and real-time analysis of metrics for yield and performance reporting.

A&D companies must meet myriad stringent requirements, from FAA and ITAR regulations to AS9100 and DCAA standards. While Trump has promised some deregulation, defense contractors are unlikely to see significant rollbacks in quality oversight due to the meticulous, life-and-death nature of their work.

To demonstrate world-class quality and industry leadership, A&D manufacturers have to achieve and maintain a powerful, agile alignment of people, processes and technology. As the pressure to do better and more with fewer resources intensifies, we must exercise our technological might to the fullest extent. Smart manufacturing capabilities are fundamental to bolstering our national defenses and our ability to compete globally in the face of threats, disruptions and unknowns.

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