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CASE STUDY
FDM

Reinventing Customer Support

How the AccelerateAM service program improves uptime and efficiency

This satellite model was printed on a Stratasys F900 3D printer.

A New Approach to Maximize Uptime

Think back to the last time your production was shut down because of an equipment fault. What was the impact – and what was the eventual cost? Machine downtime costs manufacturers millions of dollars daily. According to a Siemens report, the work stoppage cost in an automotive plant is $2 million per hour. Yet, while production downtime may never be entirely eliminated, there are measures a company can take to minimize disruptions.

Lockheed Martin, a global defense technology company, is a good example. Its additive manufacturing (AM) operations include metal printers and Stratasys polymer systems, which produce prototypes and flight-rated production hardware. To continue consistent high quality AM operations, Lockheed Martin sought a solution to minimize downtime and increase uptime, leading to the development of the AccelerateAM™ service program.

Leveraging the Advantages of Additive Manufacturing

Lockheed Martin's first Stratasys 3D printers were purchased in 2010, and since then, the two companies co-developed Stratasys Antero® 840CN03, a high-performance PEKK-based thermoplastic with ESD (electrostatic-dissipative) properties.

Lockheed Martin leverages its AM capabilities in multiple applications. One way it uses its polymer AM technology is to complement its metal 3D printing. Metal parts are expensive to produce, need to be right the first time, and have a long lead time. "Polymer is a fantastic placeholder for proof of concept, fit checks, mockups, and design reviews," says Cris Robertson, manager of additive manufacturing at Lockheed Martin Space. "We're able to put the part on a conference table in front of the customer and give them an idea of what a part might look like once produced, using a light, inexpensive polymer part. We then follow on with the exact part in metallics once we've ironed out any design changes or iterations," he adds.

That's not the limit of polymer 3D printed parts, however. Robertson points out that his team prints thousands of production parts that are installed on spacecraft.

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>
> **Cris Robertson**
> Manager of Additive Manufacturing
> Lockheed Martin

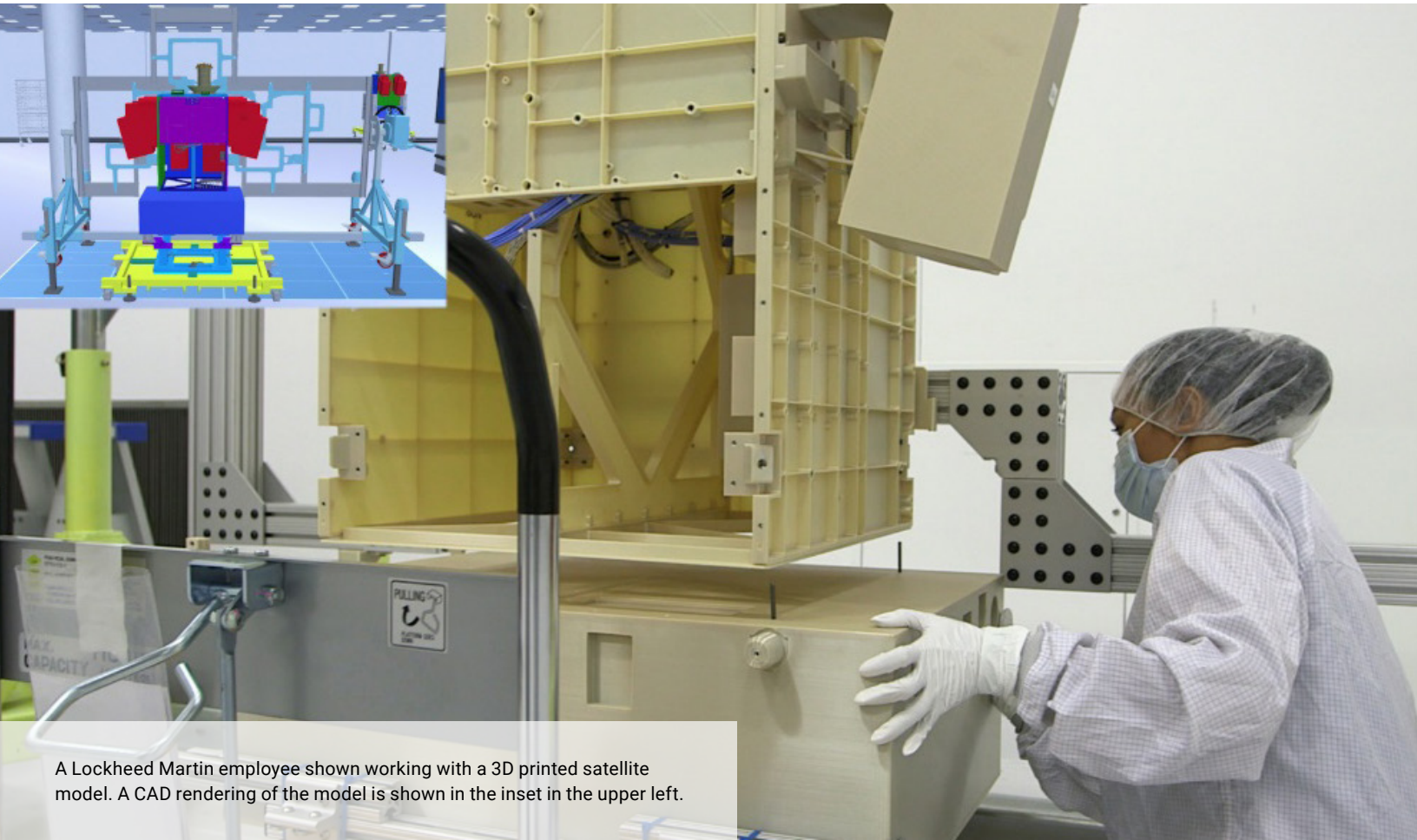
AccelerateAM – A New Level of Service

Stratasys offers several support programs to help customers resolve service issues when they arise. However, given Lockheed Martin's additive production requirements and the high demand on printers, a new solution to improve uptime and service response was needed. The result was AccelerateAM, an elevated service program from Stratasys for rapid and comprehensive support.

AccelerateAM is available in two forms: a fully managed service exclusively provided by Stratasys and a self-service option for customers seeking greater independence. The latter choice appealed to Lockheed Martin since its on-site AM team can resolve problems faster. John Griffin, Stratasys director of product management, cites the collaboration between Lockheed Martin and Stratasys as the catalyst for the genesis of AccelerateAM. "The expectations of what Cris and his team needed from their equipment rose. Their needs are going up because they're relying on this equipment for more critical applications, and their tolerance for downtime is going down," Griffin relates.

Robertson agrees, noting that Lockheed Martin runs their Stratasys printers seven days a week. For Stratasys, it was an opportunity to meet the new bar set by customers pushing the boundaries of AM manufacturing. Griffin adds, "AccelerateAM is a solution that addresses the fact that our old service model was not working for where our customers are taking us. We needed to create something new to meet their needs, and we're working together to get there."

Lockheed Martin adopted AccelerateAM for two primary reasons: operational efficiency and self-reliance. With the personalized, on-site training enabled through AccelerateAM, Lockheed Martin's AM technicians gained deeper knowledge and control over their additive processes, reducing dependence on external support. On this last point, Robertson sees its positive impact on his team. "I think this has raised the confidence level and the pride that my technicians have in their work ," he says.



A Lockheed Martin employee shown working with a 3D printed satellite model. A CAD rendering of the model is shown in the inset in the upper left.

Favorable Results on Multiple Levels

The adoption of AccelerateAM has been successful for Lockheed Martin in several ways. For example, response time to address issues that impact a machine's operational availability has been significantly reduced. With the previous service level, problem resolution was guaranteed within five days. Now, with AccelerateAM, that's been cut to one to two days. "Over the last year, I've never had a machine down for more than 24 to 48 hours," says Robertson.

This faster service response has also led to a marked improvement in printer uptime, boosting production efficiency. For instance, Robertson's team increased AM part production by 28% year-over-year, using fewer printers than the previous year. Robertson credits the gains made through AccelerateAM as a contributing factor. "I will say very confidently that the response time and having our machines up and capable was one attribute that helped us get there. If a machine did go down, within 24 hours, I had it back up. That ensured that I had full capacity available all the time," says Robertson.

Those results flowed from two factors related to AccelerateAM: customer-dedicated support from Stratasys and the upskilling of Lockheed Martin's AM technicians. "It's been really helpful to have a dedicated support line where we know the people at the other end. We know them on a first-name basis, and they know the capabilities we have," says Robertson. Training at a Stratasys facility at specific intervals is also part of the AccelerateAM Self-Service program. The intent is to educate the customer to a level of proficiency so they can address issues in-house. Problems are resolved more quickly, resulting in improved printer service time.

Beyond enabling faster resolution, the service program has allowed Lockheed Martin's AM technicians to focus on proactive preventive maintenance. By staying more attuned to hardware conditions, Robertson's team has improved printer performance and reliability. "My technicians are always recognizing and doing prescriptive maintenance to keep the machines tuned," Robertson says.

A Positive Return

AccelerateAM Service is designed to keep additive operations running efficiently and reliably while maximizing production uptime. If Lockheed Martin's experience is any indicator, it achieves that purpose. It took a level of investment for Robertson's team to attain these results – investment in time, training and spare parts. However, in the end, the benefits are the dividends.

Griffin sums up the intent of AccelerateAM this way: "The big reason to do this is speed and uptime, and building the competency to get up and running more quickly and achieve better [AM] parts." Robertson concurs, noting that they did have to put in some up-front expenditures, but in his own words, "It was a very worthwhile investment." With AccelerateAM, Lockheed Martin has not only reduced downtime but also set a new standard for how manufacturers can take control of their AM operations.

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