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Australia Looks to Additive Technology to Reduce Aircraft Repair Costs

RUAG Australia is collaborating on a two-year project to investigate laser metal deposition's uses for component repair and manufacturing.

Lindsay Bjerregaard | Jan 02, 2019

RUAG Australia, a subsidiary of RUAG Aviation, is in the midst of a two-year project to investigate the use of an additive manufacturing process

called laser metal deposition (LMD) for quicker, more cost-effective aircraft repairs. In collaboration with Australian researchers from the Innovative Manufacturing Cooperative Research Centre (IMCRC) and the Royal Melbourne Institute of Technology (RMIT), RUAG is focusing on the use of LMD to manufacture spare parts from steel and titanium.

“Strategically speaking, a shift to LMD technology means less downtime for repairs and a dramatic increase in the availability and readiness of aircraft,” says Neil Matthews, senior manager of advanced technology and engineering solutions at RUAG Australia. “Instead of waiting for spare parts to arrive from a warehouse, an effective solution will now be available locally.”

According to RMIT’s research team, LMD is essentially a very high-tech welding process where metal parts are rebuilt layer by layer, similar to 3D production technology. Metal powder is fed into a laser beam and deposited across a surface in a precise, web-like formation. The researchers say LMD’s bond is exceptionally strong, which makes it a viable process for not only manufacturing spare parts, but repairing existing parts where the repaired part is just as strong—or stronger—than the original.

“The ultimate goal of the project is to develop indigenous capability that provides innovative and cost-effective sustainment solutions through the use of additive metal technologies which, in turn, reduce life-cycle costs and maintain reliable operational availability through repair and, when necessary, real-time manufacture,” Matthews explains.

According to Matthews, LMD could foreseeably be applied in manufacture or repair of high strength steel aircraft parts, such as those used in an aircraft’s undercarriage. Within manufacturing, LMD would typically be ideal for small, complex, highly loaded “low volume” parts, such as titanium components, he says. The project’s research team is evaluating how LMD could provide demonstrable cost savings in areas

such as maintenance and spare parts purchasing, scrap metal management, warehousing and shipping.

The project is currently focused on how LMD could be applied to existing military aircraft platforms and newer systems, such as the F-35 fleet, but the team believes the technology could potentially be transferable to civil aircraft or other industries.

According to David Chuter, CEO and managing director of IMCRC, the Australian aviation industry stands to benefit significantly from the research project. The Australian Air Force's estimated total cost of replacing damaged aircraft parts is more than AU$230 million.

Matthews says RUAG Australia has been working with LMD since 2014 and the company has already identified additional repair applications for the technology, as well as a titanium component that is likely to be manufactured as a demonstration of LMD.

The research project began in March 2018 and is scheduled to finish in March 2020.

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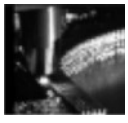
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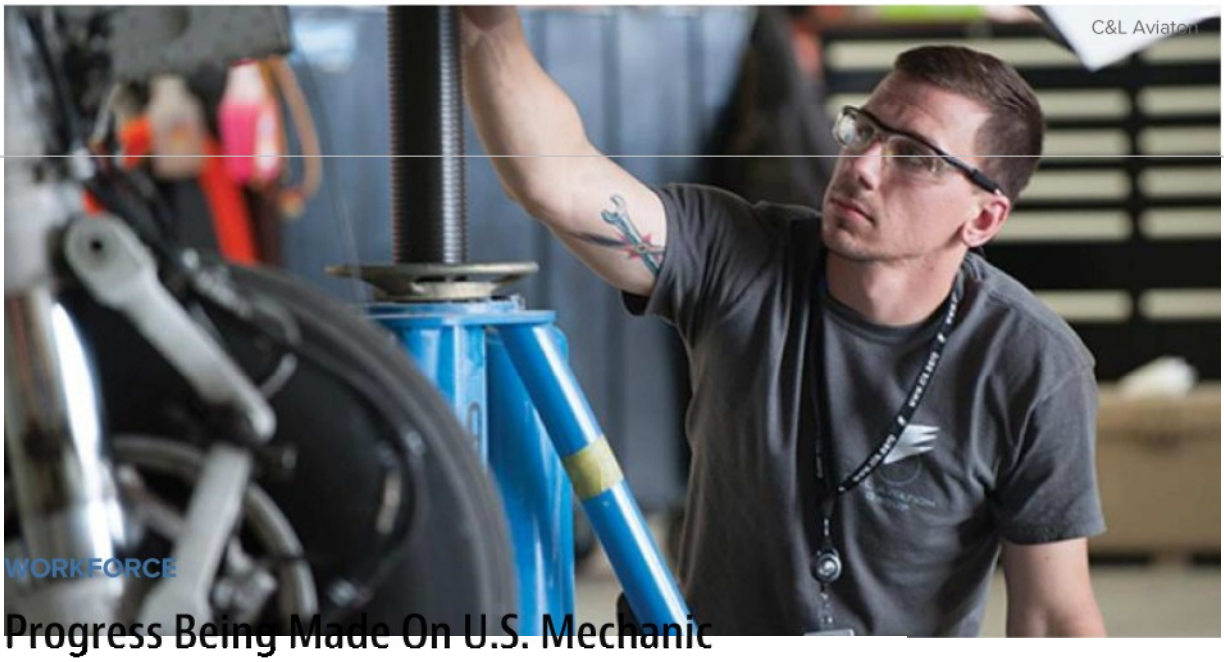

WORKFORCE

Progress Being Made On U.S. Mechanic Development

While there is positive momentum for filling the future aviation mechanic workforce needs, not all metrics are good.

Henry Canaday | Jan 02, 2019

While there are still challenges to be met, progress is being made in filling current and future needs for aircraft mechanics in the U.S., according to the latest Pipeline Report of the Aviation Technician Education Council (ATEC).

Here's the good news first: the majority of maintenance technician schools reporting anticipate the number of 2018 graduates will increase

10% over 2017, and a further 11% in 2019. And they expect total enrollment to increase 40% in 2019.

Furthermore, school capacity is no hurdle. Only one half of the seats in technical schools are now taken, so an additional 17,000 students can be readily accommodated.

One problem has been that a substantial portion of aviation technician school graduates has been seeking non-aviation jobs. The latest report says the number seeking non-aviation jobs has now dropped by nearly half, to 13%. And 70% of students are now taking the FAA mechanic exam upon graduation, a 10-point increase over the previous two years.

Of course, not all mechanics have to come from these schools. Of 6,401 mechanics certificated in 2017, 63% obtained certification based on completion of a technician school program, 10% based on military experience and 27% based on civilian experience. The FAA now counts 293,000 certificated mechanics, of which females make up 2.4%, a portion that has been constant for 15 years.

More progress must be made however. The Council reckons 30% of mechanics are now 60 years of age or older, which is a 3% increase from the prior year. And new mechanics still account for only 2% of the workforce each year. Unless this rate of replacement is increased, the mechanic population will decline 5% over the next 15 years, the Council projects.

Productivity improvements can trim some needs, as can outsourcing abroad. But so long as traffic is growing at 2-4% annually, it will be difficult to reconcile the demand with a declining supply of mechanics.

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