11/04/2017 RUAG AUSTRALIA PROVES SPD TECHNOLOGY RESTORES STRUCTURAL INTEGRITY

A RUAG Australia project proves SPD repairs successfully restore both the lost structural integrity and the load carrying capacity of aircraft wing panels. Winning the Best Written Paper Award in Additive Manufacturing, at the 17th Australian International Aerospace Congress, held at AVALON 2017, reconfirms the quality contributions made by RUAG Australia in SPD technology. Paper co-authors, Neil Matthews, RUAG Australia, and Dr. Rhys Jones, Monash University, continue to define and lead SPD innovations.

Investigating and proving the viability of Supersonic Particle Deposition (SPD) repair technology for structural components, in this case corroded wing skins on operational aircraft, is another industry milestone for the internationally renowned experts, Neil Matthews, Senior Manager Research and Technology, RUAG Australia, and Professor Rhys Jones, Head Centre of Expertise Structural Mechanics, Department of Mechanical and Aerospace Engineering, Monash University, Victoria, Australia.
The success also provides a more positive outlook for air forces, in terms of continued platform performance and improved cost-savings on maintenance budgets. "This award confirms our passion for investigating technologies which enable us to serve our customers with the best possible solutions," states Neil Matthews.

"Testing was performed on operational aircraft replicated structure using operational flight load spectra. The outstanding results are specifically interesting with regards to legacy aircraft, as corrosion related issues represent up to A$ 228 million annual spend on Australian Defence aircraft , and at least 31% of the US Air Force's annual maintenance costs. These are remarkable sums and are not expected to scale-down, even with the introduction of new aircraft, as air forces need to operate these aircraft longer, due to budget constraints," Neil Matthews points out.

The paper, entitled 'Additive metal solutions to corroded wing skins in operational aircraft', examined the use of SPD for repairs to wing elements. It proves that SPD repairs restore integrity for external patch repairs to skin corrosion, for embedded scarf repairs, and for external patch repairs to inhibit intergranular cracking (IGC). In fact, analysis reveals that SPD repairs on compression surfaces where there is up to a 50% loss of material between the risers can essentially restore the load carrying capacity of the wing, even in the case of Stress Corrosion Cracking (SCC) in the risers.

"We became aware of the technology's potential to restore lost structural integrity during our successful certification and incorporation of SPD repair solutions for nonstructural applications (geometry restorations)," explains Neil Matthews. Dr. Rhys Jones and Neil Matthews have been collaborating in the further development for this technology in structural applications since 2008 and are considered world leaders on the subject, holding several international patents on behalf of RUAG Australia.

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