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Paper Title: Fast Track Applications of AM Repairs

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Fast Track Applications of AM Repairs

AM or Additive Manufacturing as a repair process has been around in DOD for at least 20 years. First applications at Anniston Army Depot were repair processes of components supporting the Life Cycle Sustainment of the AGT 1500 turbine engine used in the M1 Abrams Platform.

Applications of AM for repair and production of new components have grown rapidly in the last 5 years and yet the technology is viewed as underutilized by its' proponents even though it has great potential to displace industrial chrome plating for dimensional restoration. Some of the reasons include the frustrating efforts to produce governing commercial specifications during a time when the technology is still evolving. Commercial applications are well documented according to company proprietary processes which are not available or shared outside the corporate walls. People who are outside of the AM community have many questions about applications and do not understand scientific explanations of an inter-granular nature. The current process within DOD for submission-evaluation of repair procedures can vary across the services and unfortunately these evaluation processes are often not well defined, archived or staffed with enough technical people. Often the primary grading standard for approval of proposed repair processes utilizes "cost savings" as number one and place little priority on readiness, obsolescence or uniqueness of the part manufacturing process such as for a forging.

A path forward for improving applications of AM repair within DOD would be to establish a team of cross-service scientist and engineers whose mission would focus on this specific application of AM. This team would input projects into a standardized, auditable, well archived database of AM repair processes which would be available to subscribers. These scientist and engineers are present today but unfortunately not networked. Evaluation criteria would focus primarily on technical merits while not ignoring but placing less emphasis on cost savings and supply chain availability. Indications are that repair processes utilizing low wattage cladding with AM can easily replace environmentally unfriendly plating for dimensional restoration repairs and the use of wear resistant or corrosion resistant deposition materials can often improve performance of the original design.

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