NATIONAL CENTER FOR MANUFACTURING SCIENCES

American GFM Corporation: AUTOMATED COMPOSITE REPAIR PREPARATION WITH STATIONARY MACHINE TOOL

NCMS Technology Showcase
FRC East

PROBLEM STATEMENT

- The frequency of minor accidental damage during the service life of composite structures has become high, and the resultant repair work has a significant impact on maintenance costs
- Existing manual repair procedures are outdated, error prone and exhaustive
- The repair method is not suitable for on-site repair because of lack of knowledge, skills or equipment, which is a time, cost or logistical burden
- A validation of the repair to predict the further service life is not possible either simply due to missing data, records or due to quality fluctuations of repair work

BENEFITS

- GFM high-precision CNC technology eliminates the effects of human error
- Complex task, but easy to use, facilitated by automatic repair program and geometry of repair plies generation
- Versatile and robust equipment with flexibility to handle a wide range of repair applications
- Suitable for larger volumes of repeatable part types such as rotor blades, leading edges, etc. that can be removed from vehicle.
- Effective and automatic application of the best practice repair strategies.
- Recording and tracking of the history enables future predictability of the further life cycle.

TECHNOLOGY SOLUTION

- GFM Advanced 5-axis milling/scarfing machine with advanced CNC machining and programming capabilities.
- After machining, the machining path is used to determine the exact geometry of the required repair plies.
- Open control to add all necessary functions (e.g. digitizing,NDI) to the editing and process recording functions.
- Integrated database for repair philosophy and continuous further development of best practice concepts.

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