

Implementing the use of DMAIC and Six Sigma Techniques for a Multi-Machine Output Process for Robotically Polished Blades with an Airfoil Midspan

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Abstract: This paper describes the use of DMAIC and Six Sigma techniques to improve the process of polishing airfoil midspan blades using robotic manufacturing cells. While much of the manufacturing, for the organization under study, is modern and involves the use of complex machines and machining techniques in efforts to further standardize the industry and improve quality and safety while increasing output, there is still much nuance in the world of polishing. For one particular New England (USA) site, this process utilizes humans for polishing the airfoil. These highly skilled laborers are harder to find with the youngest polishers being in their mid 30's. There are significant ergonomic strains that are put on the body from being in the necessary positions which are required to polish the blades correctly. The factors previously listed along with the national labor shortage of skilled workers, especially in a rural area such as New England, along with increasing customer demands and quality standards throughout the aerospace industry, and continued contracts with their customers, made the case for the investment of two robotic polishing cells. The cells have been implemented starting in 2018, and efforts to date to develop and improve the process, particularly in C_{pk} values, will be presented.