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Paper Title: Manufacturing Model Management System (3MS), An Absolute Necessity for DOD Manufacturing Processes.

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Abstract: Although the DOD latest systems acquisitions are 3DMBE defined, the majority of the metallic spare or replacement parts being fabricated for the DOD by the DOD industrial base, and managed by AFMC, NAVSUP, DLA etc., are 2D Blueprint Defined. These 2D blueprints are then translated to 3D Solid Models so that the Cutting Path Programming Software within existing Computer Aided Manufacturing(CAM) software can be utilized to create the Numerical Control (NC) language that is loaded onto the machines to cut these parts to final shape. During the Translation process, Human Translation errors can occur, yielding a solid model that does not conform to the original design intent. Further, experience has shown that in many cases, even when the solid model accurately reflects the blueprint design definition, the blueprint fails to accurately represent the part that was built and tested to meet the design criteria.

3MS is a process that was devised and implemented by NAVAIR at the FRC levels to ensure that the solid model translation will always result in the exact solid model 3DMBE geometric configuration that truly reflects the exact engineering design intent. This Presentation details examples of erroneous OEM blueprint definitions and human translation errors and the resulting problems that ensued including scrapping of parts and tedious re-translation costs and added lead time to fabricate true conforming parts that led to defining the 3MS process. The process utilizes Advanced Manufacturing Lab Equipment and Techniques to measure a sample part removed from the aircraft utilizing Laser Measurement equipment and comparing back to the translated model. Additionally, there is a 2D drawing created from pure interrogations to the model to compare back to the blueprint to ensure that the translation has been performed to exactness so that there is no question if the blueprint is found to be incorrect.

The 3MS process has drastically reduced manufacturing scrap rates and positively affected Readiness. This process is now being adopted by the three FRCS and is also applicable in correcting erroneous 3D MBE data downloaded from the OEM.

DOD wide adoption of the process will result in very large cost savings reducing scrap rates and enhancing readiness.