MxD 14-06-01	Category: Quoting Process
Title:	Supply Chain MBE/TDP Improvement
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Summary:
The project reviewed software capability to create, translate, validate and provide MBD data for a supply chain to consume. The project did not fully evaluate accuracy of MBD data being translated to the various neutral formats used on the project. Only that MBD data, via a TDP, could be transferred and consumed by supply chain. This was accomplished by selecting several design test cases and generating MBD data to be processed through a complete supply chain, from top-level OEM (Lockheed Martin), mid-level OEM (Rolls-Royce), and vendor level (Zeiss, Purdue/3rd Dimension). The MBD data, which consisted of geometry, Product Manufacturing Information (PMI), attributes and supplemental documentation, was created, using various CAD systems (Siemens NX, Dassault Catia) and other software. The design information did not include 2D drawings. The project completely relied on MBD to communicate all design, manufacturing and inspection data. The 3D data was translated and validated to various neutral formats (STEP, JT, 3D PDF) using ITI and Anark software. The packages of design data were assembled into TDP packages and sent to the supply chain (Figure 1). The TDP/MBD was consumed by the supply chain as needed to complete a simulated real-world design/manufacturing/inspection task. A design change was introduced into the process. From the "round-trips" through the supply chain, lessons were learned, documented; training and guidelines were developed to better educate OEM and supply chain on the current state of MBD/MBE/TDP capabilities. All of which are just a snap-shot of current capabilities by the software companies used on the project. Advancements and support of standards by organizations, providers, consumers, and industry continue to improve and learn.

The project was able to demonstrate the usage of the MBD neutral formats being consumed through the supply chain. Emerging technology availability to supply chain proves the difficulty for complete adoption of MBD through the entire supply chain. Given varying CAD systems within the supply chain and OEMs, the importance of a CAD neutral format becomes evident quickly. Not only is building proper design intent into the MBD important based on requirements established by company and industry, but also the consistency between the original CAD and neutral formats, as to not lose the intent and data integrity. Results for the currently available formats were documented (See Appendix A). The compliance with industry standards (e.g. STEP AP242, ASME Y14.41) and/or company standards during creation, translation, and validation is vastly important for OEMs to be able to communicate full design intent throughout the supply chain. OEMs and suppliers are encouraged to use the latest software to gain the most benefit from working in a Model Based Enterprise.