

49th IAA SYMPOSIUM ON SAFETY, QUALITY AND KNOWLEDGE MANAGEMENT IN SPACE
ACTIVITIES (D5)

Knowledge management and collaboration in space activities (2)

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ADVANCING MODEL BASED SYSTEMS ENGINEERING IN AEROSPACE PROJECTS

Abstract

Model Based Systems Engineering (MBSE) is rapidly growing in importance in the aerospace industry. The Rotorcraft Systems Engineering and Simulation Center (RSESC) of the University of Alabama in Huntsville (UAH) is currently working to understand, develop, and advance MBSE for the aerospace industry.

MBSE in aerospace is still in its infancy; however, if implemented correctly across the industry it can lead to a paradigm shift in how projects are run and how systems engineering processes are conducted. The use of a variety of software applications enables the move from a document centric to a model based approach powered by interconnected computer technology. Through the use of such tools, requirement correctness can be validated in the early stages of design, complex interfaces and trade spaces can be analyzed and other sophisticated analyses can be performed through data mining of the available information. The system engineer, project manager, and other members of the Integrated Product and Process Management team can have up-to-date view of the critical aspects of their specific metrics and key parameters as the design evolves.

While there are many advantages of using MBSE in projects, there are also challenges - especially with the exchange of data. The available software tools generally use common standards, most notably the Systems Modeling Language (SysML). However, most of these tools have additional proprietary elements in addition to the defined standards that make data exchanges more challenging. The purely technical aspect of data exchange is only one factor in how a particular model and, ultimately, knowledge and information can be exchanged between partners, customers, and clients who may use a variety of software tools across their respective enterprises. There is not much heritage to draw from, and solving these kind of problems in a fast paced project environment for specific organizations is far from trivial.

To work on solutions of these issues, the RSESC created a lab environment at UAH that is specifically geared towards understanding how modeling can improve projects, and how it can be applied and rolled out effectively. In addition to advancing the MBSE cause, the lab also presents an opportunity for Government and industry to work together with our experts to set up the ideal environment for their specific project, given specific requirements and boundary conditions. This paper highlights the RSESC's approach to setting up a breeding ground for MBSE, and presents a road map for the next steps.