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GENERIC SATELLITE MODEL LIBRARIES: RAPID MOVE TO SYSML

Abstract

Model based system engineering (MBSE) is gradually taking over the roles of document based systems engineering approaches which have been used extensively over the years in the space projects. With the growth of MBSE approaches, there will be a need for space system developers to change their Systems Engineering organizations to meet the requirements of the new standards.

While this may not exert a significant cost on well-prepared companies and organizations, it is a different case for smaller, and less-experienced ones. In smaller space institutions, and emerging ones, this gradual move toward the MBSE methods are non-existent or rarely systematic. Most of the technical team may not even be familiar with the term. But Establishing the MBSE approaches are inevitable, as even the standards are moving toward MBSE. This means that a solution should be used to jump start these less-experienced technical teams in to the world of MBSE. The solution proposed here is to develop a generic model library, which can be easily reused, and tailored for the specific needs of a space projects. The feature is included with the SysMl plugins and in model development platforms. Using a generic model library, the cost and time of moving toward MBSE.

The goal of this paper is to introduce a generic satellite model library developed for the purpose explained above. The library is specifically tailored for institutions and teams working on small satellites. This class of satellite, while diverse in mission objectives, have similar building blocks, but with different design specifications. These reusable subsystem and component structural blocks are created with as much variables as possible to facilitate future tailoring. On the other hand, operational (behavioral) models are also included in this library. The procedure to tailor the generic models to specific small satellite requirements are explained in a case study on a remote sensing small satellite.