

SPACE SYSTEMS SYMPOSIUM (D1)  
System Engineering Tools, Processes and Training (1) (3)

Author: Mr. Julien Tallineau  
QinetiQ Space nv, Belgium

CONCURRENT ENGINEERING APPLIED TO SMALL SATELLITE PHASE B PROJECTS:  
QINETIQ SPACE METHODOLOGIES

**Abstract**

In the last years, the interest in concurrent engineering (CE) has grown to a point where several space industries tried to implement their own system for Phase 0/A studies. In that sense, CE demonstrates more and more its capability to reduce cost and development time within projects.

However, its applicability has always been limited when increasing the level of detail considered. It appeared that the approach followed for early phases of space projects are not suitable anymore for typical phase B activities. The models do not contain enough elements to characterize the level of details required. In addition, they do not easily cope with the amount of data exchanged between the different actors. This implies a certain reluctance of the space industries to invest time and money in improving the traditional CE models and strategies to fit their industrial constraints.

Based on the experience acquired during the Phase B of the PROBA-3 formation flying mission, it is now implemented at QinetiQ Space processes and methodologies to facilitate the use of CE within such a Phase B framework for small satellite development. Both the team management approach and the software infrastructure have been reviewed to allow an efficient way of working given the constraints of a Phase B level of details. Dedicated effort has been put to evaluate the moments within the project where CE can be best applied in a determined time-frame (one day session per week, two separate sessions per week). In addition, Model Based System Engineering (MBSE) approach was studied while trying to interlink the traditional Space Industry Tools available on the market and used at QinetiQ Space.

This paper will focus on the different methods applied with the team as well as the mindset in which the system engineer shall approach the CE sessions. Lessons learned will be presented with some recommendations in order to ensure that the knowledge is well transmitted to other space industries willing to use CE in later phases of their project life cycle. Finally, MBSE implementation feasibility will be discussed as considered as the potential next generation of System Engineering.