

SPACE SYSTEMS SYMPOSIUM (D1)
Space Systems Engineering - Methods, Processes and Tools (1) (4A)

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STATISTICS AND EVALUATION OF 60+ CONCURRENT ENGINEERING STUDIES AT DLR

Abstract

Since 2007, the German Aerospace Center's (DLR) Institute of Space Systems in Bremen has operated a Concurrent Engineering Facility (CEF), a systems analysis laboratory specialised in performing early stage design in the most efficient and consistent way possible, through the implementation of the Concurrent Engineering (CE) process. Working within a guided procedure, the simultaneous access of multidisciplinary groups of experts to a shared database, and the direct verbal and medial communication between all the experts, are the defining characteristics of Concurrent Engineering studies.

As of today over 60 studies have been conducted in the CEF (with an average of about 7 per year), all the while maturing the CE process and adapting it to combine the system and domain expertise of DLR and its specific conditions. Although mostly focused on satellite design, exploration missions and space transport systems, the CEF has enabled the study of different kinds of developments such as life support systems, or space-based and terrestrial infrastructures.

CE activities include both feasibility analyses for potential future systems and missions, as well as design contributions to already planned projects and missions. Due to the valuable results and further inputs to all projects, as well as the intense and fruitful interactions within the team together with the educational aspects for the study participants, an increasing interest in applying the CE approach for internal and external projects can be observed. Since the studies are characterized by e.g. varying study objectives and team members, used data and design models as well as by process- and planning adaptations, there is a continuous growth of lessons learned from each previous activity.

This paper will outline the different applications of the facility, including a brief description of all systems, missions and architectures which have been designed and analysed in the CEF since its conception. Additionally, the evolution and progress of the CE approach at DLR will be examined, on the one hand from the organizational point of view and on the other hand with respect to the content-related aspects such as study elements and objectives. Furthermore, it will provide and discuss various statistics related to projects, tools and planning issues as experienced within studies up until now, touching upon major lessons learnt. A clear set of definitions, additional complementary activities related to the CEF, as well as an outlook for future activities in terms both of studies and process development, will complete this paper.