SPACE SYSTEMS SYMPOSIUM (D1)
System Engineering Tools, Processes and Training (2) (6)

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THE SYSTEMS CONCURRENT ENGINEERING LABORATORY

Abstract

This paper will present the initiative of the Laboratory of Integration and Testing (LIT) of the Brazilian Institute for Space Research (INPE) in order to develop a reference process and infrastructure for complex systems engineering - the Systems Concurrent Engineering Laboratory. As well known for this kind of organization, the core competence is related to the knowledge related to satellites assembly and the system and sub-system testing process and capabilities. As an important part of this knowledge, there is the expertise to develop the ground support equipments (GSEs), as they are specific to each spatial program. At LIT, it was identified that additional competences should be created to allow the proper development of GSEs, which means improvements on quality, cost and timing. Therefore, LIT has decided to create an internal group to develop competences on concurrent and systems engineering approaches and techniques, as the organization has identified them as mandatory for the achievement of the aimed improvements. This organized group, called Systems Concurrent Engineering Laboratory (LSIS), has three major goals, first of all is the creation of a product development reference process that meets the organizational characteristics of space programs and LIT specific needs. The process that is being developed will bring together the steps to be followed for the product development plus the suggestions of techniques and tools that could be adopted to achieve the process steps. In order to create this reference process several projects cases are being conducted simultaneously at LSIS and the lessons learned from each one of them are being used to refine the reference process. The second goal is to have LSIS information technology structure prepared to allow the integration of the reference process, techniques and tools to guarantee the realization of activities such as Stakeholders Analysis, Requirements Engineering, Modelling and Systems Integration. The third goal is to develop the human resources with the necessary capabilities to help the organization on the new process implementation for future GSE development. Therefore, this paper will bring the LSIS project main results for each one of the above goals. The paper will present the Laboratory team work methodology, examples of project cases and the product development reference process. Finally, it will be presented the conclusions and lessons learned from this development phase and the new challenges for process implementation at LIT.