

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

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MISSION / SYSTEM EARLY PHASE DESIGN PROCESS

Abstract

Space system design often starts with needs and a concept. Then, system baselines are defined and trade studies are performed by making minor changes in order to get some improvements in performance cost, schedule and risk. Not considering the full range of the possible designs and their associated cost and utilities (usefulness value) may lead to inadequate mission requirements, long design times and systems not globally optimized.

The paper describes the approach which is implemented at PASO ("Plateau d'Architecture des Systèmes Orbitaux"), the CNES space mission feasibility office. PASO is one of the tool for the preparation of the future at CNES. It is used for the programme preparation phase and is the incubator for all future projects. Its main function is to study the space mission feasibility (Phase 0 of a project).

The main elements of the approach during phase 0 process are the following - set up an interactive process to evaluate the added value of the mission among a larger system, help in the formulation of the demand, identify the mission drivers with respect to utility/ usefulness, - consider and analyse a large range of possible mission concept options, - promote creativity, - get technical experts opinions, pay regard to stakeholder or key decision maker standpoint - track the points of unfeasibility, identify remaining critical points

The objective of the process is to provide - a final set of mission requirements for one or several mission options, - relevant system concepts with associated cost and risks, - an attendant demand and/or technology support programme for future development.

The paper also describes the assets of the process : the implementation of a cross-functional organization and the "Concurrent Engineering Facility" tool linked to a set of expertise tools and opened for the collaboration with our partners.