

SPACE OPERATIONS SYMPOSIUM (B6)
New Operations Concepts and Commercial Space Operations (2)

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APPLYING SPACECRAFT OPERATIONS COMPLEXITY METRICS TO SPACECRAFT DESIGN
TO REDUCE OPERATIONS COST

Abstract

Accurately assessing the cost of post launch operations is not a straightforward process. Often times, spacecraft operations are not considered in the spacecraft design phase, leaving a spacecraft that is devoid of any operational influence. This paper will demonstrate how factoring operability into the design phase may lead to changes that can reduce the cost of spacecraft operations through the use of an operations cost model. The cost model utilizes ninety-five metrics for operational complexity which are then used to predict operations costs by determining the level of staffing needed in full time equivalents (FTEs). The complexity metrics are organized into four categories which correspond to four primary sources of operational requirements; mission design and planning, flight system, risk avoidance, and ground system. The complexity metrics can be used by mission operations management to discuss the operability early in the life cycle and provide a way to significantly influence the design of the spacecraft to support the mission needs. This paper will describe how to use the complexity metrics during the design phase and then utilize the model to assess the team size for several current operational missions. This predicted operations team size will then be compared to the actual team size and recommendations will be given to reduce the complexity and hence the cost of the mission operations.