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Safety and Quality for "Low Cost" Space Programs (1)

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ON IMPLEMENTING A BALANCED APPROACH TO SAFETY AND MISSION ASSURANCE FOR LOW-COST SPACE MISSIONS

Abstract

The overall trend within the aerospace community to smaller and lower-cost platforms is undeniable. With increasing pressure on funding availability by civilian agencies and industry as a whole, there is a need to accomplish more work under a severely constrained environment. This has allowed for some tremendous and creative breakthroughs of achieving desired results in such a constrained environment. However, it has also led to some shortcomings on safety and mission assurance, which have in turn produced incomplete missions or cases where mission objectives are not met.

But how can we strike the right balance of a safety and mission assurance regime that allows for proper oversight without crippling the program? In this paper we will answer that question by taking a look at a recent set of missions implemented at The Johns Hopkins University Applied Physics Laboratory (JHU/APL). Among others, we will focus on a pair of near-space ballooning flight missions where one had tremendous success in meeting all of its mission objectives while the other did not. In particular, we will delve into what contributed to the overall mission results of these low-cost missions, especially from a quality control regime. We will also address the shift in workforce culture necessary to implement these type of low-cost missions in an environment of limited resources, both schedule and funding. We will also address the ability to "tailor" the quality requirements to provide for targeted enforcement in particular areas while allowing for relief in other areas. All of this will be presented in the context of actual programs administered and flown by JHU/APL.

Finally, we will offer guidelines and lessons learned to be applied to future low-cost space based missions. These will be summarized and presented in a way that other organizations can apply to their unique environments. As such, we feel this paper will be beneficial to all Space-based organizations that wish to emphasize the proper amount of safety and mission assurance for future low-cost space missions.