

SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)

Space Technology and System Management Practices and Tools (4)

Author: Mr. Dustin Doud
SpaceX, United States, dustin.doud@spacex.comDESIGNING FOR THE FUTURE BY TESTING TODAY: A SUMMARY OF SPACEX SYSTEM
MANAGEMENT PRACTICES**Abstract**

SpaceX is committed to revolutionizing access to space by providing highly reliable space systems. Our workhorse space systems, the Falcon 9 launch vehicle and Dragon spacecraft, were designed from the ground up to provide access to space that is safe, rapid, and economical. We embrace a test-like-you-fly philosophy, and use controlled processes to test technology developments and maintain mission assurance.

One aspect of this thinking is adherence to a distributed systems engineering philosophy. While many classical systems engineering concepts are based on preventing design escapes within an extensive network of subcontracting, SpaceX is heavily vertically integrated, producing between 75% and 80% of its products in-house. As a result, the company is shaped around effective communications between design, production, testing, and frequent iteration between the three. To aid rapid and accurate communications, SpaceX has purposely enabled positions that work across subsystems and product lines, in addition to the traditionally anchored engineering lead. With this system, aided by cutting-edge digital tools, engineering performance and top level requirements are verified and optimized by repeated subsystem and integrated system testing.

This paper presents SpaceX management practices used to tie development, test, and production of new technologies together into an integrated system that maintains mission assurance and customer satisfaction.