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POLICY INNOVATION IN HUMAN SPACE FLIGHT

Abstract

This paper describes the status of U.S. human space flight, alternative approaches to the conduct human spaceflight, and common pitfalls in planning and implementing innovations in human space flight. In many cases, NASA has been given goals that proved out of reach, politically, technically, and economically. The challenge for a human spaceflight strategy lies not in creating ambitious goals but in determining just where the frontier for policy innovation truly lies. This knowledge is important to picking a strategy that is “ripe” for success, for knowing when the time is right to press forward with a political initiative, technology development, or a business plan.

The powerful symbolism of human spaceflight has historically led the space community to confuse what it wants to be true with what turns out to be true. High flight rates for new vehicles increase cost-effectiveness so high flight rates are set as a requirement. Reusability is believed to lower launch costs so multiple complex engineering challenges are accepted. Fiscal constraints encourage hopes for private investment and international cost sharing.

There is both an art and a science to making trade offs among cost, performance, schedule, and risk in developing new space systems. Unfortunately, there are often mistakes in judgments of technological and political readiness and misplaced historical and economic analogies. Space technology is not information technology and it is not aviation – it is harder and more complex. Space is not a physical frontier that is open to individual effort, but a truly alien environment that requires organizational as well as individual genius to master. It is not enough to just have a physical destination for human space flight. Destinations should be a means of answering questions, creating capabilities, training organizations, and forging new relationships to serve the interests of all parties.

Finding the true frontier for innovation in human spaceflight is a matter of judgment as well as calculation. This frontier is a shifting one and problems that were not ripe for solution yesterday may be ready tomorrow. Innovations in human spaceflight require contradictory skill sets – planner and developers need to be both objective and visionary, innovative yet disciplined. This is especially hard as the interdisciplinary nature of human spaceflight is already one of the most challenging of technical activities.