

NASA Technology Demonstrations Missions Program Overview

Susan Turner, Assistant to the Engineering Director

Engineering Directorate
NASA Marshall Space Flight Center, AL 35812

Abstract

The National Aeronautics and Space Administration (NASA) Fiscal Year 2010 (FY10) budget introduced a new strategic plan that placed renewed emphasis on advanced missions beyond Earth orbit. This supports NASA's 2011 strategic goal to create innovative new space technologies for our exploration, science, and economic future. As a result of this focus on undertaking many and more complex missions, NASA placed its attention on a greater investment in technology development, and this shift resulted in the establishment of the Technology Demonstrations Missions (TDM) Program. The TDM Program, within the newly formed NASA Office of the Chief Technologist, supports NASA's grand challenges by providing a steady cadence of advanced space technology demonstrations (Figure 1), allowing the infusion of flexible path capabilities for future exploration. The TDM Program's goal is to mature crosscutting capabilities to flight readiness in support of multiple future space missions, including flight test projects where demonstration is needed before the capability can transition to direct mission application.



Figure 1. Lander concept.

The TDM Program has several unique criteria that set it apart from other NASA program offices. For instance, the TDM Office matures a small number of technologies that are of benefit to multiple customers to flight technology readiness level (TRL) 6 through relevant environment testing on a 3-year development schedule. These technologies must be crosscutting, which is defined as technology with potential to benefit multiple mission directorates, other government agencies, or the aerospace industry, and they must capture significant public interest and awareness. These projects will rely heavily on industry partner collaboration, and funding is capped for all elements of the flight test demonstration including planning, hardware development, software development, launch costs, ground operations, and post-test assessments. In order to inspire collaboration across government and industry, more than 70% of the TDM funds will be competitively awarded as a result of yearly calls for proposed flight demonstrators and selected based on possible payoff to NASA, technology maturity, customer interest, cost, and technical risk reduction. This paper will give an overview of the TDM Program's mission and organization, as well as its current status in delivering advanced space technologies that will enable more flexible and robust future missions. It also will provide several examples of missions that fit within these parameters and expected outcomes.