

SMALL SATELLITE MISSIONS SYMPOSIUM (B4)
Hitchhiking to the Moon (8)

Author: Mr. Daniel Andrews

National Aeronautics and Space Administration (NASA), Ames Research Center, United States

LCROSS LUNAR IMPACTOR - LESSONS LEARNED FROM A SMALL SATELLITE MISSION

Abstract

The Lunar CRater Observation and Sensing Satellite (LCROSS) launched with the Lunar Reconnaissance Orbiter (LRO) on June 18, 2009. While the scientific purpose of the LCROSS mission was to determine the presence of water-ice in a permanently-shadowed crater on the south pole of the moon, an equally important purpose was to be a pioneer for future low-cost, quick-turnaround, risk-tolerant small satellite NASA missions. Recent strategic changes within NASA level have only furthered the importance of small satellite missions in the Agency's portfolio.

When LCROSS was selected by NASA's Exploration Systems Mission Directorate (ESMD), NASA Ames Research Center and its industry partner, Northrop-Grumman, initiated a spacecraft project two-years after its sister mission had started, with less than one-fifth the budget, that had to be completed in time to launch on the same launch vehicle. With a \$79M total cost cap (including operations and reserves) and 31-months until launch, LCROSS needed a game-changing approach to be successful.

At LCROSS' Confirmation Review, the ESMD Associate Administrator asked the LCROSS Project to keep a close record of Lessons Learned through the course of this mission and to share these with the Agency at the end of the mission. This paper will summarize the Project, the mission, its risk position, and some of the more notable lessons learned from the LCROSS Project.

With the success of LCROSS, NASA demonstrated the potential for conducting high-value science missions at a fraction of the cost of traditional mission approaches and may well be a pioneer for the \$100M mission class.