

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Governmental Human Spaceflight Programmes (Overview) (1)

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APOLLO VS. ARTEMIS: A COMPARISON OF THE CHALLENGES AND RISKS OF HUMAN
LUNAR MISSION CAMPAIGNS

Abstract

As international space exploration nears a return to lunar missions, comparisons and questions with respect to past accomplishments are natural. Building on the success of the Apollo and Saturn V lunar missions during the mid-20th century, NASA has learned many valuable lessons. The general physics of going to the moon do not depend upon the decade; however, many specific differences arise in the development of the flight test campaigns and the relative risk of the mission design itself. This paper will highlight characteristics of the flight test campaigns compared between Apollo Program launched via the Saturn V and Artemis utilizing the Orion, Space Launch System, and Human Landing Systems. In particular, assistance of a much larger body of spaceflight knowledge, ability to leverage demonstrations and technology from other spaceflight programs, and modern analysis and depth of knowledge provides significant leverage in the flight test campaign. Key risks and comparison of the probability of success for the mission relative to an end to end launch to landing for the mission designs will be explored. While at a glance, it appears the success of Apollo missions should be ‘easy’ to replicate, this paper will highlight the mitigation of risk and the increased capabilities of Artemis.