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Author: Dr. Keum-Oh Lee
Korea Aerospace Research Institute (KARI), Republic of Korea

Mr. Jong-Chan Park
Korea Aerospace Research Institute (KARI), Republic of Korea
Dr. Jaesung Park
Korean Aerospace Research Institute, Republic of Korea

A STUDY ON SOUTH KOREA'S MANNED SPACE LAUNCH VEHICLE DEVELOPMENT STRATEGY

Abstract

The South Korean orbital launch vehicle Nuri, which was successfully launched in 2022 and 2023, has the capacity to carry 3.3 tons to LEO. The launch vehicle is powered by the same kerosene gas generator cycle engine as the Soyuz and the Falcon 9, which are currently used successfully as manned launch vehicles, and are considered suitable for use as a manned launch vehicle once its reliability is improved. According to South Korea's latest space plan, it aims to develop a manned space launch vehicle by 2045 to put astronauts into LEO. SpaceX launched its Falcon 9 in 2010, but it took another 10 years to get astronauts aboard, and Russia took a whopping 16 years to get astronauts aboard its Soyuz 2.1a after the first launch of the Soyuz 2 in 2004. India has yet to conduct a successful manned flight test, 18 years after it began development of its manned spacecraft Gaganyaan in 2007. Therefore, South Korea's manned space launch vehicle plan should begin in 2025, so that it can put people into orbit by 2045. To convert the Nuri launch vehicle to a manned launch vehicle, we studied the launch success rate, number of launches, development time, and technology required for a manned launch vehicle. We also studied how manned missions could be expanded using South Korea's next-generation launch vehicle, which is being developed with the goal of an unmanned lunar landing by 2032.