

for a nuclear power source. "In the early 1960s," Truscello said, "I was writing position papers that said that there were no other options than RTGs for our planetary missions. The intensity of light decreases by $1/r^2$ as you get away from the sun. So once you get beyond Mars, the size of solar panels you would need is huge."⁴⁰

Although JPL had never worked with nuclear power sources, as the result of many years of planning and execution of planetary missions, the laboratory acquired a great deal of knowledge about RTGs. JPL also conducted a great deal of materials and lifetime testing. The laboratory's role was not to develop RTG systems, but to integrate them on planetary spacecraft. The mission's name, "Mariner Jupiter/Saturn 1977," was changed to "Voyager" shortly before its launch; it was scheduled to have an RTG power source. "You can't easily shift schedules on a mission like Voyager," said Truscello, "the launch window occurs with much less frequency than for missions like Apollo." The abbreviated missions to the outer planets, finally defined in 1972, had stayed on schedule, but not without some technical problems.

Each Voyager spacecraft was powered by three Multi-Hundred Watt generators having a combined output in the order of 475 watts per spacecraft. Thus, the total nuclear power for the Voyagers was about equal to that of all previous missions still in space in 1977.⁴² As launch time approached for the two Voyagers, which would depart within a few weeks of one another, an ERDA announcement stressed the magnitude of this latest space exploration:

Nuclear power generators provided by the Energy Research and Development Administration (ERDA) will make possible the longest space mission ever planned—a 10-year voyage starting with closeup television pictures of Jupiter and Saturn—then perhaps a look at our Sun's distant planets, Uranus and Neptune.⁴³

Rod Mills, NASA program manager on Voyager, explained, "Because the mission went so far out, we decided to send two spacecraft to insure against failure." A boom extending out from the spacecraft carried the RTGs. Instruments for the spacecraft were mounted on another boom located 180 degrees from the RTG boom.⁴⁴ Voyager was launched on schedule, in 1977. The launching of Voyager 1 took place on 5 September 1977. Although Voyager 1 was actually launched two-and-a-half weeks after Voyager 2, it was designated