



Figure 8. SNAP 27 RTG on Lunar Surface

The prime contract for the SNAP 27 RTG was held by the General Electric Company, Valley Forge, Pennsylvania, and a major subcontract by the 3M Company (Converter). The SNAP 27 thermoelectric elements, lead telluride, initially operated at a hot junction temperature of 593°C. The thermal insulation was powdered MIN-K and the thermopile was encased in a beryllium outer case. A fill gas (argon) to suppress sublimation was sealed in the converter. The fuel capsule contained a thermal inventory of approximately 1480 watts (1520 for Apollo 17) derived from plutonium dioxide microspheres encased in a super alloy shell. Reentry protection for this capsule was provided by a graphite (Hitco) cask attached to the Lunar Module.

The original design requirements provided for a one-year life at a minimum power output level of 63.5 watts electrical. The SNAP 27 RTG's have far exceeded this design goal. Currently, all five RTG's are still producing power (Figure 9).

Transit -- The purpose of the Transit program was to provide accurate navigational location data. The first Transit satellite utilized the Doppler frequency shift principle, and was launched in April 1960, while the fourth (June '61) used the first RTG (SNAP 3) as a secondary power source. The Transit RTG which had no SNAP designation (Figure 10) was launched aboard the Triad OI-1 spacecraft via the Scout launch vehicle in September 1972.