II. VIKING RTG OPTIONS

This chapter presents the results of performance studies performed for the Viking RTG options. The baseline RTG configuration is a TAGS-85/2N unit employing a 675 thermal watt heat source. The 3P/2N RTG configuration is similar to the SNAP 19 Nimbus III units incorporating 625 thermal watts. Performance parameters are presented for both the baseline intact impact heat source (IIHS) and the alternate intact re-entry heat source (IRHS).

A. TAGS-85/2N RTG

The TAGS-85/2N RTG, considered as the baseline design for the Viking mission, is a modified SNAP 19 Nimbus RTG. Figure II-1 depicts the modified design, and shows the internal details of a unit. Each RTG unit weighs 28.2 pounds and produces a nominal 44.1 watts at beginning-of-life, decreasing to 40.7 watts at end-of-mission, conservatively defined in this study as one year after launch. The baseline heat source design is a 675 thermal watt IIHS. An RTG unit occupies an envelope approximately 11 inches long by 24.4 inches across the fin tips. The internals of the generator are sealed by Viton O-rings at each end of the finned magnesium thorium alloy cylindrical housing. The initial fill gas is argon at approximately 1 atmosphere absolute pressure.

1. Design Description

A detailed description of each major component in an RTG unit follows: