

return to the Moon again in the twenty

General Electric's SNAP-27s were designed for lunar missions, but the momentum of the Multi-Hundred Watt contract and the Apollo program ended, an unmanned

century.<sup>18</sup>

designed uniquely for manned space exploration. Apollo experience carried them to the deep-space applications. Before the unmanned mission found uses for RTGs.

### The Challenge of PIONEER

Charles Hall, Pioneer Project Manager at NASA-Ames in Sunnyvale, California, managed the program first defined as an interplanetary probe to be as a "rowboat" compared to the Apollo. He did not scrutinize his program as much as Apollo. Because of its comparatively small budget, it could be pulled along in the wake of Apollo. Program directors sold on RTGs by Apollo experiences further proved the technical capabilities of the RTG program and its contractors.

Hall had reservations about using RTGs because the first Nimbus carrying an RTG degraded too fast on the RTG that accompanied the Nimbus launch in 1969. On the other hand, he was in favor of using solar cells. The scheduled launch of Pioneer 10, was early 1972, and the decision was undecided three years before the launch. Hall convinced NASA headquarters to negotiate with TRW. This was done in 1969. "The design was pretty limited," Hall said, "but it was better than going through all the hassles of solar cells."

NASA headquarters favored the use of RTGs, as did AEC's Space Nuclear Systems Division. At about the same time of the completion of the solar power study for Pioneer, Carpenter at the AEC came to Ames to talk with Hall about the SNAP-19, developed by Teledyne and last flown on the Nimbus weather satellite. Hall was finally convinced that much had been done to improve the SNAP-19 since Nimbus. It was made more attractive, in Hall's view, by the AEC's agreement to fund all development costs and to build all the

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RTG on a three-year space mission failed on launch and, also, the power source accompanied the successful Nimbus launch. The question was whether a mission to Jupiter could be attempted. To expedite system development, a sole source contract should be awarded. TRW proposed the use of solar cells. Hall commented, "but it still looked better to go with the AEC of using RTGs."<sup>20</sup>

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