advocates to take shape—a core of people who, both among government employees and private-sector contractors, became zealous about proving and improving their technology.

Importance of Solving Early, Basic Technical Problems. When the RTG technology first was made public, it was presented as a field where a "breakthrough" had been achieved—enabling electric power to be obtained directly from isotopic heat by thermocoupling, making space applications possible immediately. The breakthrough was nurtured and capitalized upon; opportunities for applications became building blocks for accumulating knowledge and experience around a proven technical capability. Through the years, improvements were sought and achieved in heat sources, materials, thermocoupling processes, conversion processes, and safety procedures. Moreover, the technology persisted to the day when the original breakthrough was no longer of definitive importance. Improvements in related technologies made the isotopic-dynamic option feasible; improvements in cost-per-watt-delivered were sought in systems where isotope heat turned rotating equipment. Thus, RTG development cycle had continuity that carried beyond original breakthroughs and earlier barriers.

Importance of Being Safe and Responsible. The RTG program people would agree that one can never be too careful, or too concerned with safety in the nuclear field. Fearful that one accident could destroy the whole program, they began early to address safety problems. They also maintained a procedure of providing public information about potential hazards and follow-up information when mission aborts did occur. Safety research and development went hand-in-hand with research and development in the RTG technology and was wedded to specific spacecraft. Changes in safety concepts, procedures, and testing kept pace with new hazards associated with new mission requirements, new RTG configurations, and increased fuel loadings. Although the safety program added to the users' costs for RTG power, it helped to bring the program through years that were difficult for nuclear power.

Importance of Having Missions. Technical research and development may be greatly constrained and difficult to perform when it must be justified by and linked to mission requirements. This complaint was voiced early by the Martin-Nuclear developers; and it continued to be sounded throughout the