



Figure 6. Power required for various mission lengths.

In the area of manned exploration, let us project some possible future energy requirements of bases on the surface of the moon and planets. Here we may well meet the greatest energy challenges of the next decade.

Manned bases on the surface of the moon may be the first users of large nuclear power plants in space. A semipermanent station on the moon probably would require between 150 and 250 kilowatts, which could be supplied only by nuclear reactor power. Smaller shorter-duration stations would require between a few hundred watts and a few kilowatts for life support and for charging the batteries of lunar exploration vehicles. For the smaller stations we are considering the use of isotope as well as reactor power plants.

If we choose to develop larger stations or even colonies on the moon, we will probably have to transport and assemble there even larger nuclear power systems. In addition to providing heat or cooling as required and all electric power, such reactors could possibly be used to extract water from the rock, to help produce synthetic food, and to extract minerals and other materials from the surface.

Perhaps some time in the most distant future, if enough nuclear power can be made available on a planet, it might be possible to convert, to a limited degree, some of the materials on the planet's surface into a