Many problems are involved here. But I must add that the scientists and engineers at Los Alamos Scientific Laboratory who pioneered the concept and those at Westinghouse Electric Corp. and Aerojet-General Corporation, all of whom have been taking part in various phases of our Rover Program, have been doing an outstanding job in overcoming these problems.

Since the beginning of the Rover Program, we have conducted a string of important tests at the AEC's Nuclear Rocket Development Station located at the Nevada Test Site near Las Vegas.

During the course of these tests, nuclear rocket reactors in the 1000-megawatt range were operated successfully at full power and high temperatures; specific impulse values approaching twice that of advanced chemical propulsion were reached; reactors were restarted and operated at full power through multiple cycles; and all these reactors were started rapidly and brought to full power under automatic program control.

In addition to these accomplishments, we have already completed a series of tests of the entire NERVA engine that saw that system operated for about 3½ hours at various power levels. A round trip to the moon would be on the order of 50 minutes.

In addition to the nuclear rocket, we are also developing the nuclear power technology required for an electric propulsion system. Such a system, in contrast to the relatively high thrust of the conventional nuclear rocket, would be a highly efficient low-thrust system producing a higher specific impulse. It would use electrical energy to accelerate the propellant by first ionizing the propellant gas and then accelerating it to higher velocity by electrical and magnetic means and ejecting it from the vehicle.

The thrust of the nuclear electric rocket is small compared to that of the chemical or nuclear rocket. For example, whereas the upper-stage engines of the Saturn V moon rocket, the J-2 engine, has a thrust of 200,000 pounds, the thrust of a large electric propulsion stage engine might be about 20 pounds. However, this thrust, applied over a very long period, including the time when the conventional rocket would be "coasting," can eventually build up a velocity greatly exceeding that of the chemical or nuclear rocket. For many desirable missions this can result in greatly reduced mission times and increased payload weights. Such a propulsion system therefore becomes invaluable in cutting