

The Lunar Module No. 4, which is the second full system Lunar Module was accepted the day before yesterday for delivery. So, we do feel that program now is coming into phase with the rest of the program.

After delivery of Lunar Module 3, the first full system Lunar Module, to the Cape, certain difficulties were encountered in the early phases of the checkout and this produced a decision that we could accomplish more in the first manned Saturn V flight (Saturn 503) by removing the Lunar Module from that flight and carrying on the flight with the rest of the equipment.

Naturally it is true the earlier we can start maturing systems in flight the better off we are, and there is the fact that we did remove the Lunar Module, but this particular approach does allow us to get flight experience on the other major elements of the system, and I do feel it was the best plan under the circumstances.

Mr. GEHRIG. Well, what are the principal problems on the Lunar Module?

Mr. MATHEWS. The principal problems that were encountered early in this test period were related to what we call electromagnetic interference. I do not want to say this was the sole source of difficulties nor were they extremely larger than expected, but this sort of problem is the result of testing many systems in combination with each other and the interaction between electronic systems that did have to be cleared up. It is somewhat of a cut and try type of activity.

Those problems have been pretty well solved at this point in time.

Mr. GEHRIG. Is there any problem with the rendezvous radar system on the Lunar Module?

Mr. MATHEWS. The rendezvous radar was one of the systems that did have this class of problem. In the configuration that was initially delivered to the Cape, the rendezvous radar was over sensitive to noise inputs. This problem has been analyzed, has been isolated, and corrective action has been taken.

I would not say we will not have further problems with the rendezvous radar, but that particular problem has been taken care of and we do not know of any additional problems right at the moment.

Mr. GEHRIG. How is the weight of the Lunar Module now?

Mr. MATHEWS. The weight of the Lunar Module is adequate for the lunar mission. This aspect is something we have had to watch all the time, and we are continuing to watch.

There have a number of weight reduction programs. This is another class of activity that tends to eat into our funding margins. We have adequate weight margins for the lunar missions starting with Lunar Module No. 5. Lunar Module No. 6 has been provided with further weight reduction modifications.

Mr. GEHRIG. Now, with respect to the new injector, does the Lunar Module ascent engine have to go through a full qualification test with this new injector?

Mr. MATHEWS. No. This is a case where you do exercise engineering judgment as to what portions of the previous test programs are applicable. The injector is just one part of the engine. The combustion chamber, the nozzle, the expansion cone, the valving for the engine, all these parts are all common and have been previously qualified.