

itself provide quality assurance penetration down to the third, and fourth, and fifth tier subcontractor. But, nevertheless, it is our job and the job of this quality and reliability laboratory to provide a quality assurance network throughout our industrial organization to make sure that we are really getting our money's worth and to avoid to the extent humanly possible the kind of incident I have just cited. This is a very difficult thing to do because our lunar program is low-density fabrication in industrial terms. We are not building millions of something. We are building only a dozen or so pieces of a very expensive commodity in this program, and a space vehicle can meet with catastrophic failure if only one nut or bolt is inadequate.

Now, how do we protect our prime contractors from using some wrong material when they cannot possibly control their vendors' quality procedures with the necessary depth? For example, shall we tell a prime contractor, "You can never buy anything from Company X because we don't know whether their product is adequately tested"?

Well, we make it the contractual duty of our primes to either assure themselves that the product delivered to them gets special treatment or, if that is technically impossible, to assure themselves by acceptance control, that nothing slips into their system that is unacceptable. The continuous surveillance of these techniques, processes and standards comprise the main function of our quality laboratory. Of course, our Apollo program has many thousands of quality inspectors throughout industry trying to protect our program from a little oversight that can have major and disastrous consequences.

The Research Projects Laboratory deals with the application of new research ideas to the over-all program. After we froze our design for Apollo, this Research Projects Lab took a back seat for a while because we had committed ourselves so heavily to a major development effort for Saturn that there was very little room to experiment with new ideas. But now that the Apollo Applications program is moving into the foreground, and we are trying to use Apollo hardware for new scientific objectives, the Research Projects Lab will again play an increasingly important role in Center operations.

Finally, I would like to mention the Computation Laboratory which is a large electronic computation center, one of the largest in the country. This lab serves not only all elements of the research and development operations, but also industrial operations and the supporting staff offices of the Center.

As to the center-level staff offices, these are normal organizations that a facility of this size would require, and I shall not discuss them in detail.

My next chart shows our permanent manpower positions. At the end of fiscal year 1966, we had 7,271 permanent manpower positions at the Marshall Center. We shall fall off to 7,030 by the end of fiscal year 1967, about 240 spaces. This reduction is due to economy measures we have taken. In 1968 we would remain at the fiscal year 1967 level.

You may have one question in connection with our stability here. You know that in many areas the total Apollo Program is over the manpower hump. Most stages and major elements of the program are on the assembly floor and there is no need to keep our industrial com-