

and you will notice the very large number of hours that were required in the first checkout and acceptance of the Gemini spacecraft.

Those large number of hours, sometimes like 10 times the eventual hours required to check it out, represented the discrepancies that had to be fixed, "squawks" that something had to be done about. Now, if you recognize, too, that the Apollo spacecraft is 10 times as complex as the Gemini spacecraft, it is not surprising that you have 20,000 discrepancies. In fact, we have regarded this as being a nominal situation in the first model of a development spacecraft. Maybe half of those represent problems in getting the paperwork up to date because we do keep a very careful record of each of the spacecraft components and we do want to make sure that the records are up to date before it leaves the factory. So every paper that isn't properly filled out, properly signed and so on, there is a record made of it and the proper action has to be taken before we will accept the spacecraft and that goes right on through.

Now, I think that one has to recognize that in any development program the way you learn is by finding things wrong and fixing them and the way the people learn to manufacture and the way the people learn to carry out the checkout, the way the people learn to think for launch, is not by doing everything right the first time because you don't know enough about the spacecraft to be able to do it right without having gone through the procedures once and found out how they really worked.

I don't recall the Apollo program in an overall sense as being in difficulty. I sincerely believe that the basic Apollo spacecraft design is sound and that the reason we can accommodate the changes that we are anticipating within our budget is that the design was basically sound and the changes that are required are going to be relatively nominal.

That doesn't mean they are negligible. They aren't large changes. They don't represent basic design flaws and basic difficulties in the test and checkout areas.

Mr. GURNEY. In other words, the many discrepancies that were referred to, perhaps it might be fair to say show the worth and excellence of the test program and the discrepancies that you have are not more than you would normally expect?

Dr. MUELLER. That is correct.

Mr. TEAGUE. Mr. Rumsfeld?

Mr. RUMSFELD. On this same subject, not with respect to the specifics of the accident but on procedures, I notice on page 21 of your supplemental material you say "Our procedures have in the past required that each test be conducted, be reviewed from the safety standpoint."

On page 11, you say "most of the spacecraft systems are adequate for safety" and so forth.

That review is conducted within NASA, is that correct?

Dr. MUELLER. As a matter of fact as I guess I explained last year, we have a series of reviews of the spacecraft and the launch vehicle.

Mr. RUMSFELD. Are any apart from NASA?

Dr. MUELLER. The President's Science Advisory Committee had a subcommittee under Dr. Frank Long that spent 6 months reviewing in great detail, the designs and procedures and so on that were used.