

I think maybe one of the ways I can better understand this would be if I could see the number of accidents you have had that resulted in a cost of excess of \$100,000 and the type of people that were on the boards that investigated those accidents.

Dr. MUELLER. I will be glad to find that. We are going to put together some material in this area that Mr. Fulton has asked for. We will try to do just that.

Mr. RUMSFELD. I don't understand how the Navy and the AEC can do it with respect to the Polaris submarine, how they could get this independent review and why it couldn't and shouldn't be done by NASA. I want to see what the differences are. At some point we better understand this problem.

Mr. WAGGONER. The chairman wants to finish Apollo today. Will the gentlemen agree that any other questions he may have will be given to Dr. Mueller in writing?

Mr. RUMSFELD. I have written to Mr. Webb. Since the first 50 pages was on the accident, I thought it would be appropriate.

Mr. TEAGUE. Mr. Rumsfeld, the investigation hearing on the accident will be broad, and you are invited to attend. Safety questions might better be asked there.

Mr. RUMSFELD. I am not privileged to serve on the Oversight Committee.

Mr. TEAGUE. You will be invited to attend whether you serve on it or not.

Mr. RUMSFELD. Fine.

Dr. MUELLER. Turning to the second stage, we also have problems on it with respect to getting the first flight stage down to Mississippi.

To put this in perspective, you have to recognize that the second stage is perhaps the most difficult technical development in the Saturn V vehicle. It represents a step forward, a rather considerable step forward in that it is the largest cryogenic stage we have yet developed.

We did, in order to proceed with the program, substitute in our initial checkout of the Saturn V, at Cape Kennedy, a spacer (fig. 16, MA 67-5796) that permitted us to check the ground support equipment, the electrical support equipment of the first stage, third stage, the instrument unit and the spacecraft while waiting for the initial second stage to complete its firing at the Mississippi test facility.

That was successfully completed at the end of 1966 (fig. 17, MC 67-5998) and the complete vehicle is now being stacked up in Florida.

Another problem that we ran into was the loss of the third stage for AS-503 at Sacramento during its static firing test (fig. 18, MC 67-5707).

We found here a problem that occurred in a vendor's plant, a substitution of a pure titanium welding rod for the right kind of welding rod which caused the pressure vessels in the stage to burst. These are titanium tanks that contain high pressure helium and over a period of time there was sufficient growth of a titanium alloy hydride in the joint of the weld to cause a fracture and this resulted in the loss of a stage.

We were able to trace it all the way back to the manufacturing process that failed and again it turned out in this case to be a human error. The inspector said it was the wrong welding rod and the welder