

When we started this chart, the availability of these particular facilities was 19 weeks behind schedule. By analyzing the various things that seemed to be out-of-line timewise, working on them as individual items, or planning around them, we brought the availability up to the scheduled time by January.

In April we realized suddenly that a certain requirement for this particular facility was 20 weeks behind schedule. This requirement happened to be the use of the facility in September for the 500 F operation. The General Electric Co. was supposed to furnish a hazard monitoring system; that is, a monitoring system that would tell us if any hydrogen was leaking for a hydrogen operation necessary in August. We got the General Electric Co. to furnish a part of that system which would be useful for this particular operation on time. We therefore brought the facility back to a time when it could be completed and usable on schedule. This is what we refer to as a work-around. The whole hazard monitoring system wasn't going to be furnished, but that part that was necessary for that particular task was ready.

This PERT technique is used quite a bit within the Apollo program to give us the program visibility needed to exert our efforts in proper priority to stay on schedule.

Another management problem is the interrelation of configuration management logistics and data management as reflected in figure D-25. These things are all mutually dependent because, without good data management or configuration management, you don't have good logistics, and vice versa.

There are policy directives from headquarters, but they are general in nature, so we have had to fit these systems to our program requirements.

We started local training programs to top and middle management and operational supervisors. We integrated the three systems that are mentioned and have benefited by eliminating duplication and having a method of measuring accomplishments. I have shown here just one chart (fig. D-26) which shows one of these measures of accomplishment.

We have always to consider changes in our hardware that are necessitated by changes in flight hardware. This chart illustrates interface revision notices resulting from such hardware changes. In the past 15 months we have spent approximately \$31.4 million for equipment changes. At the same time we have avoided what would have been an additional \$11 million in cost. We do not know whether such a savings would have been possible without this formal system. However, we know today that because of conscientious utilization of configuration management disciplines our personnel have avoided incurring over \$11 million of officially requested changes.

In summary (fig. D-27), I would like to say that we have met our goals through the past year, and we have met milestones within the program needs.

We have established management systems and controls which I hope are quite effective. We are ready to go into the new phase which I believe was dramatically illustrated by the chart showing the C. of F. and R. & D. planning.