

changes. I can't go past this item without pointing out that it has required a great deal of cooperation on the part of MSC to live through these tests with us, to understand these pieces of equipment as the development tests progressed, so that, as time went by, we could adjust the qualification testing to prove that which was necessary.

I think I should explain that a little bit more and point out that as a piece of equipment is tested and understood, what was originally set up as its qualification requirements evolves and, because a qualification test is a formal demonstration of the acceptability of the equipment, this then leads to approvals of these procedures. It has taken quite a bit of cooperation to cause all this to happen in a timely fashion.

Representative WAGGONER. What do you mean by "required penalty runs"?

Mr. GAVIN. When you have a test which doesn't quite seem to meet the requirements, rather than go back and rerun the whole test, it frequently makes sense to make the adjustment necessary and rerun only that portion of the test involved.

Generally, the results have been quite encouraging. The flight hardware looks very good, and it seems to bear out the design approach. There are a small number of important things which have not yet fully completed qualification. There are also some which are scheduled for the 15th of February, and this is another date of importance to us. We expect the qualification program will support the LM flight schedule.

I'd like to speak a little bit at this point about some of the significant management activities in the past year (fig. 31). Looking back, many of the things we take for granted or understand today, were speculative a year ago. Going from the concept to a well-defined design took time and effort and a number of difficult choices. The exacting requirements on all elements have caused a continued struggle be-

SIGNIFICANT MANAGEMENT ACTIVITIES

- GSE DESIGN & MANUFACTURING STRENGTHENED
- STRENGTHENED SUBCONTRACTOR MANAGEMENT CONTROL
- ADOPTED WORK PACKAGE CONCEPT
- INSTALLED 3RD ACE STATION
- INCREASED COLD FLOW TESTING CAPABILITY

FIGURE 31