

AUG 7 1969



UNITED STATES GOVERNMENT

Memorandum

TO : CA/D. K. Slayton

FROM : PA/Manager, Apollo Spacecraft Program

SUBJECT: Crew procedures

DATE: August 7, 1969
 In reply refer to:
 PA-9-8-24

I am sure that you were as disturbed as I was that the handling of crew procedures was so bad for the last flight that Armstrong felt that he had to make a point of this in front of NASA management from outside MSC during the recent debriefing. Even before then, I have had many comments from FOD, E&D, and ASPO, voicing grave concern about the way changes for the Apollo 11 onboard data file were handled.

Since then, I have tried to understand what the real problem was and have reached the following conclusions:

- a. The checklists became available for review fairly late.
- b. There existed confusion concerning the source of the final "flight" checklist. For example, there was a CSM-solo checklist that people outside FCOD generally didn't realize existed.
- c. The number of changes was extremely high; 675 checklist changes were processed in the 30 days prior to launch. I realize that only very few of these had any technical substance. Nevertheless, the high change traffic made it difficult to get a good technical review of the substantive changes.

I understand that much of this was caused by the extremely short turn-around time between flights and that many people were overworked and just barely able to keep up with all that had to be done. The important thing is that we make use of the additional time that is now available between flights to avoid our previous mistakes.

We would recommend the following procedures for Apollo 12:

- a. Final review copies of all onboard procedures and checklists should be available for distribution by September 1, 1969.
- b. A formal planned and scheduled review cycle should take place during the month of September. The flight crew, contractors, FOD,

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E&D, ASPO, and FCOD should be involved in these reviews. The reviews should be scheduled well in advance and review meetings should be run with a great deal of formality.

c. The final flight books should be issued approximately 6 weeks before flight, on or about October 1, 1969.

d. Only mandatory flight safety changes should be considered after that time. Each change should be justified in writing (that is, the reason for making the change should be clearly stated). No change should be approved unless it is considered by a board chaired by you. If necessary, this board could meet on a daily basis by telephone. (If we have done our job during September, the change traffic should be very small during the last 6 weeks, and this effort should not be too burdensome.) I would also recommend that if you are not available, this function should be delegated upward to the ASPO level to the Configuration Control Board (my CCB).

I consider the onboard data and the procedures used by the crew to be just as important as the flight hardware. This means that control of these procedures and changes to the procedures must be just as rigorous as control of flight hardware. I urge you to consider the recommendations made in this memorandum in a positive fashion.



George M. Low

cc:

AA/R. R. Gilruth
FA/C. C. Kraft
PA/G. W. S. Abbey

CB/T. B. Stafford
CB/C. Conrad, Jr.

PA:GMLow:jsw 8-7-69