OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

XIV.03

Memorandum

TO : M/Associate Administrator
for Manned Space Flight

DATE: 27 JAN 1967

27 Jan 67

FROM : MA/Apollo Program Director

SUBJECT: S-II Stage Program Report - Week of January 23, 1967

The S-II continues as the pacing item in the Apollo/Saturn V Program. The two static firings of S-II-1 have added confidence to the basic design of the S-II stage. However, the amount of transferred work with this vehicle to KSC and the continued slips in the subsequent stages emphasizes the critical status of scheduling in the S-II stage program.

Early in January of this year the NASA task team, headed by Col. S. Yarchin began its operations to expedite the Seal Beach/Downey activities. During my review of this program on January 6, 1967 on the West Coast, the planning and forecasting for the S-II Program presented a significantly improved program posture. However, just two weeks later during the second review, the schedules for S-II-3, -4, and -5 had slipped approximately eight, seven, and twelve days respectively. There is still a problem of defining the work to be done, setting a schedule, and making it.

MSFC Manufacturing Lab personnel are members of the Task Team and are working together with S&ID on problems in the manufacturing/fabrication area. For example, the application of the improved MSFC welding technique at Seal Beach has already upgraded the quality of the welding.

During the review I conducted at KSC on January 19, 1967 of the planning for the S-II-1 at this site, I was most favorably impressed with the comprehensive planning for the known work and the positive attitude displayed by the S&ID personnel at KSC. I left with the feeling that properly supported, they can fulfill the job before them so as to establish a new trend in this program. This success of the S-II-1 to support the present 501 launch date is absolutely and critically dependent upon the timely support of the Downey organization in supplying the modification kits and making the necessary decisions for the work to be carried out.

The enclosure contains the status of stages S-II-1 through S-II-5.

Samuel C. Phillips
Major General, USAF
Apollo Program Director

Enclosure - (1)

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S-II STAGES STATUS

S-II-1

The second static firing was successfully accomplished on December 30, 1966, and the stage shipped to KSC for post static checkout and modification. The stage arrived at KSC on January 21, 1967 and was transported to the low bay area for LH_2 tank inspection and start of modification.

An estimated 23,000 M/hr. of work was transferred with the stage to KSC.

S-II-2

This stage is scheduled to be shipped from Seal Beach for MTF on January 27, 1967. The planned dwell time for the vehicle at MTF is 79 days and includes two static firings.

The stage transferred work estimate to MTF is 10,000 manhours.

To reduce the hazards during operation of the stage due to the LH_2 bulkhead offset, the LH_2 tank pressure has been reduced by 3 PSI (36 PSI to 33 PSI). While this places the stage calculated factor of safety in a conservative 1.25 range, the -502 launch vehicle relenquished an estimated 1200 pounds of payload capability.

S-II-6

This stage continues in fabrication of its major assemblies. Importantly, however, the LH_2 forward bulkhead to #6 cylinder weld, using the improved MSFC welding method, was completed and analyzed for certifying this welding method to be employed on S-II-3 and subsequent stages.

Following the welding, the bulkhead was cut off and set aside pending the investigation of the corrosion attack on this assembly.

S-II-3

The stage successfully completed pneumastatic test on January 21, 1967, and is undergoing final system installation before starting manufacturing checkout scheduled for March 2, 1967.

The pneumastatic test was accomplished to verify the LH_2 forward bulkhead to #6 cylinder weld. This bulkhead replaces the original assembly damaged by the in-tank access ladder failure.

S-II-3 manufacturing schedule has slipped about eight days between the Apollo Program Director's reviews of January 6, 1967 and January 20, 1967.

S-II-4

The LH_2 forward bulkhead has been removed and rewelded to correct the out of tolerance offset that existed between the bulkhead and upper cylinder. Repairs to some 23 areas of the weld are underway.

LOX tank girth weld has been completed with NASA approval following the removal of the original LOX tank aft bulkhead that was damaged beyond repair during attempted rework on the original weld.

The acceptability of the J-weld on this stage remains as an item of discussion between NASA and S&ID due to repairs made on several areas which were grooved completely through the material during early repairs.

Replacement of the aluminum LH_2 outlet ducts with the new stainless steel ducts is taking longer than expected due to the matching and drilling operations of the bolted-in flange which holds the ducts.

S-II-4 has slipped approximately seven days between the Apollo Program Director's review on January 6, 1967 and January 20, 1967.

S-II-5

The out of tolerance offset LH_2 bulkhead has been removed from the upper cylinder and will be replaced by the S-II-7 bulkhead.

During hydrostatic test of the LOX tank, leaks were observed in the tank doubler area. Some of the bolts and mini-seals were replaced, but the leakage persisted. Subsequently, lead coated bolts were inserted replacing the bolt/mini-seal. This new attachment/sealing configuration is planned to be hydrostatic tested the week of January 23, 1967.

(If this development proves successful, S&ID might request such a change as far back as S-II-2).

During the rework of the J-weld, the cutting apart of cylinders #1 and #2 resulted in approximately ½ inch out of tolerance dimensions on the cylinders due to misalignment of the cutting apparatus. Thus the respective cylinders from S-II-6 will be used on S-II-5 while the original cylinders are reworked for suitable application on S-II-6.

While work continues on the fabrication of the major assemblies for the stage, the schedule for this stage has slipped about 12 days between the Apollo Program Director's review on January 6, 1967 and January 20, 1967.