



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

JOHN F. KENNEDY SPACE CENTER
KENNEDY SPACE CENTER, FLORIDA 32899

REPLY TO
ATTN OF: AA-RQA

JAF

MEMORANDUM

TO: Distribution

FROM: AA/Manager, Apollo-Skylab Programs

SUBJECT: OMSF Skylab Program Directive No. 59 dated November 21,
1972, Subject: Skylab Flight Readiness Reviews

The subject directive was reviewed by this office and was found to contain basically the same requirements as the preliminary issuance of the directive previously reviewed by the Center directorates in July 1972. KSC Program Directive 8620.X/AA, Skylab Flight Readiness Reviews, is presently in work to implement the requirements of the subject Skylab Directive.

Robert C. Hock

2 Enclosures:

SPD No. 59

Briefing Note to Dr. Debus

Distribution:

Apollo-Skylab Distribution M

JH

DEC 2 1972

Dr. Debus

SUBJECT: Skylab Program Directive No. 59

The subject directive, titled "Skylab Flight Readiness Reviews," dated November 21, 1972, outlines the requirements for the readiness reviews to be conducted by the MSF centers prior to each Skylab mission. These requirements are essentially identical to those developed for the Apollo program per APD 8B and reflect the basic configuration changes in the flight hardware.

Three FRRs are planned for the Skylab program: one for SL-1/SL-2; and one each for SL-3 and SL-4. It is expected that the SL-1/SL-2 FRR will be scheduled on two consecutive days after the SV FRT for SL-2 and before SL-1 Rollout. The dates that the Skylab Program Director has tentatively established for planning purposes are March 29 and 30, 1973. The SL-3 and SL-4 FRRs will be conducted on a Δ basis after their respective SV FRTs. No changes are contemplated in the structure of the KSC LRRs or the OMSF FRRs as previously conducted for the Apollo program.

Kennedy Program Directive 8620.X/AA is in preparation at this time for implementing the OMSF SPD No. 59.

The new directive will be given the normal distribution to the second level directorates, and those individuals having primary interest in the program.

Robert C. Hock
Robert C. Hock

21 NOV 1972

SKYLAB
PROGRAM DIRECTIVE NO. 59

TO: Distribution

FROM: 
DIRECTOR, SKYLAB PROGRAM

SUBJECT: Skylab Flight Readiness Reviews

OFFICE OF PRIME RESPONSIBILITY: Skylab Program Engineering (MLE)

REF: a) Skylab Program Directive No. 11A, dated October 14, 1970, Subject:
Sequence and Flow of Hardware Development and Key Inspection, Review
and Certification CheckpointsI. PURPOSE

This directive defines the review procedure and requirements for the Skylab Program Director's Flight Readiness Review (FRR) to be conducted prior to each Skylab mission. It also defines the reporting procedure for FRR open actions and open work resulting from and developing subsequent to each FRR. Reference (a) shows the relationship of the FRR to other Skylab hardware development and key inspection, review and certification checkpoints.

II. SCOPE AND BASIC ORGANIZATION

Each FRR will be conducted by the Skylab Program Director. He will be assisted by a Board consisting of senior Headquarters and Center personnel and by a Secretariat consisting of technical specialists from the Skylab Program offices.

The FRR will be conducted as a consolidated review of the hardware, software, the flight crew and all operational and support elements to assess their readiness to begin the mission. There will be three FRR's for the normal Skylab Program (one for SL-1/SL-2 and separate FRR's for SL-3 and SL-4). An FRR will be conducted for the rescue vehicle if a rescue mission is required.

Each FRR covers the readiness assessment of the CSM, AM/MDA, ATM, OWS, PS, launch vehicle, GSE, launch complex, launch support, all operational elements, flight experiments, all software including computer programs, and all safety and emergency provisions and procedures as appropriate. The FRR concerns the determination of the suitability of a particular space vehicle for a scheduled flight mission assignment, as well as the readiness assessment of

operational elements required to support the mission. Specific FRR presentation requirements are identified in Section VI.

III. GUIDELINES AND SECRETARIAT LETTERS

Approximately six weeks prior to the FRR, a guidelines letter will be prepared by Skylab Engineering, coordinated with the cognizant Center and Skylab Program Office Directorates and issued by the Skylab Program Director. It will contain special requirements not covered in subsequent paragraphs of this directive and a preliminary agenda identifying topics and time allotments.

IV. FRR SCHEDULE

The SL-1/SL-2 FRR will be held subsequent to the Saturn Workshop (SWS) integrated systems test review and the Center Pre-FRR meetings at approximately the time that the SL-1 vehicle is ready for transfer to the pad. SL-3 and SL-4 FRR's will normally be held subsequent to their respective Flight Readiness Test (FRT). The exact FRR dates will be established approximately 30 days in advance of each FRR.

V. CENTER PRE-FRR MEETINGS AND RELATED REVIEWS

The Skylab schedule requires that SWS integrated systems tests be performed at KSC prior to closeout of the Orbital Workshop (OWS). The results of these tests will be the subject of an intercenter review after test completion. The status of significant problems, their closeout action and open items from this review will be presented by the appropriate Center as an element of the SL-1/SL-2 FRR.

Center Preliminary Flight Readiness Reviews (Pre-FRR's) will be conducted by MSC, MSFC, and KSC as more detailed assessments of flight readiness.

Representatives of the Skylab Program Director's staff will attend each Center Pre-FRR. The Director, Skylab Engineering (MLE), will coordinate the determination of those Pre-FRR items not requiring the Program Director's review at the FRR. Such items will not appear on the final FRR agenda. Confirmation of the items to be covered will be accomplished by TWX within two working days following the Pre-FRR.

VI. FRR PRESENTATION REQUIREMENTS

A. Responsibility for Major Agenda Items

The responsibility for major agenda items are as follows:

1. Review Objectives - Skylab Program Director.
2. Mission Summary - MSC Flight Operations Director

3. CSM (including rescue capability) - MSC Apollo Spacecraft Program Manager.
4. Orbital Workshop, ATM, Airlock, MDA, and PS - MSFC Skylab Program Manager.
5. Launch Vehicle - MSFC Saturn Program Manager.
6. Loose Equipment and Stowage - MSFC Skylab Program Manager.
- MSC Skylab Program Manager.
7. Experiments - MSFC Skylab Program Manager.
- MSC Skylab Program Manager.
8. Launch Complex - KSC Skylab Program Manager.
9. Launch Operations and Support - KSC Launch Operations Director.
10. MCC Readiness - MSC Flight Operations Director.
11. Network Readiness - GSFC Network Director.
12. Medical Status - MSC Medical Director.
13. Flight Crew Readiness - MSC Flight Crew Operations Director.
14. Recovery Readiness - MSC Flight Operations Director.
15. Action Item Summary - Skylab Program Director.

B. Presentation Emphasis Guidelines

1. The agenda topics shall be presented in sufficient detail and scope to enable the Skylab Program Director to make a judgment as to flight readiness.
2. The flight hardware readiness portion of the review shall include:
 - a. The status of action items and open items from the Design Certification Reviews including an impact assessment of any items which remain open.
 - b. The results of factory acceptance testing and identification of significant open work and unresolved problems transferred to KSC.
 - c. Major emphasis on flight hardware testing at KSC and the disposition of significant anomalies or failures that have occurred during KSC testing.

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3. The agenda topics will normally:
 - a. Commence with an overall readiness summary, be followed by appropriate supporting detail and conclude with a readiness assessment.
 - b. Emphasize significant resolved problems when necessary to establish confidence.
 - c. Emphasize significant unresolved problems, their impact and constraints to the mission.

4. As applicable to the agenda item and making maximum use of the above guidelines, the following presentation areas should be covered to the depth necessary to enable a decision on the flight worthiness of the hardware.

- a. Factory Tests: Results of qualification or verification testing not completed at the time of acceptance or the appropriate DCR. Identification of significant acceptance test problems that were open at the time of delivery to KSC or which have impacted KSC test operations.
- b. Configuration: Identification and rationale for significant hardware change-outs that have occurred since factory acceptance, ICD/IRN status and the logistics status of critical flight spares.
- c. KSC Tests: Results of KSC checkout and test operations of hardware and software with emphasis on significant anomalies and their resolution.
- d. Computer Programs: Verification and status of the checkout and flight computer programs utilized for Skylab.
- e. Waivers and Deviations: Identification and rationale of significant waivers and deviations to Skylab test and checkout requirements specifications and criteria, KSC test and checkout plan and procedures, CEI specifications, and Cluster Systems Requirements Specification subsequent to DCR's.
- f. Reliability and Safety: Identification and status of limited life components and any problems or failures related to Categories I or II Single Failure Point Hardware. Include a safety assessment based on KSC testing.

- g. Launch and Flight Preparation: The status of readiness of ground support systems, AFETR, Network Support Operations, crew training readiness, launch and flight mission rules and the launch and flight operations activities; emphasizing significant hardware or procedural problems or anomalies that could impact or impose constraints to the mission.
- h. Controlling Documentation: Identification and status of controlling launch, flight, recovery, and other supporting guidelines and procedural documentation necessary for the conduct of the mission in each appropriate area.

5. The SL-3 and SL-4 FRR presentations will particularly identify and discuss the closeout of flight anomalies from the previous Skylab mission(s). Reuse of flight hardware, configuration changes and mission rules changes from prior mission(s) will be addressed.

VII. FRR DOCUMENTATION REQUIREMENTS

A. Prior to the FRR

Six paper copies of the Center Pre-FRR vu-graphs are required by the Skylab Program Office immediately following each Pre-FRR. At the same time, MSC and MSFC will also supply the Skylab Program Office with information on the status of Certificate of Flight Worthiness (COFW) endorsements.

B. At Time of the FRR

Vu-graphs used at the FRR will be retained by the Skylab Program Office. Fifty paper copies of the vu-graphs will be provided at the FRR to the Secretariat for distribution to participants. MSC and MSFC will provide an updated status of the COFW endorsements for inclusion in the FRR minutes.

Backup documentation or reports that are referenced or used at the FRR will be made available on request to the Secretariat.

VIII. FRR ACTION ITEM AND OPEN WORK CLOSEOUT

The Skylab Program Managers will report weekly the status and closeout of open actions assigned at the FRR by the Program Director, and the open work identified at the FRR by the Program Managers and recorded in the FRR minutes. Significant open actions which are identified subsequent to the FRR will also be reported. The following specific reporting guidelines will be followed:

1. Significant open actions that occur subsequent to the FRR will be reported to the Program Director. Routine open actions that can be corrected prior to the launch and actions which do not delay the launch or violate space vehicle or launch complex configuration integrity, or cause basic changes to

mission rules, flight plan, or abort and alternate mission plans, need not be reported. Each new open action reported will be given a brief title/description and an estimated completion date.

2. Reporting of open actions being rescheduled will include the reason for rescheduling, actions planned for closeout, and the new closeout date.

3. Reporting of open actions closed out will state fully the basis for closeout, that is: action taken, data obtained, and determinations made.

4. Launch Vehicle open actions which entail joint MSFC-KSC responsibilities and Skylab modules and experiments open actions which entail joint MSFC-MSC-KSC responsibilities will be reported closed out by MSFC and MSC Program Managers respectively based on coordination with the Program Manager at KSC. Closeout reports on these open actions will indicate the KSC Program Manager's concurrence.

5. Reporting of open work closed out will state the basis for closeout if the work is considered to significantly affect configuration integrity, or if the basis for closeout is other than completion as planned at the time of the FRR.

6. A final review of all open items will be included in the final readiness review held two days prior to launch (L-2 day meeting).

IX. FRR MINUTES

The FRR minutes will be prepared by the Secretariat and be released approximately one week after the FRR.

X. ACTION

This directive shall be implemented by the Skylab Program Managers to insure effective planning for and conduct of an FRR for each Skylab Mission and for FRR reporting.