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*has copy
Mary: please return
for me
JFB
2-8-74*



REPLY TO
ATTN OF: AA-PCO

DF
RM. 3629
KSC HQS.
ATTN. WASILESKI
SLD-GOQ-1 H-1

JAN 25 1974

MEMORANDUM

TO: Distribution

FROM: AA/Manager, Sciences, Applications, Skylab and ASTP Programs

SUBJECT: OMSF Program Directive M-D MR 1200.160, dated December 28, 1973, subject: Institutional Base Work Package System Directive No. 1

Subject Program Directive has been received by this office, and a copy is transmitted for your information and compliance.

A copy of my Briefing Note to the Center Director concerning this directive is also included.

William H. Rock
William H. Rock

Burke/BETHAY

Enclosures

- 1. Institutional Base Work Package System Directive No. 1
- 2. Briefing Note to CD

Distribution:

Skylab/ASTP/Sciences and Applications/Institutional Program
Distribution H

JAN 18 1974

J 11/22

BRIEFING NOTE FOR DR. DEBUS:

SUBJECT: OMSF Program Directive M-D MR 1200.160, dated December 28, 1973, subject: Institutional Base Work Package System Directive No. 1

This directive formalizes and updates the previous draft copy of the OMSF "Institutional Base Work Package System Directive" dated May 15, 1973, under which the Center has previously prepared and submitted the MSF work packages.

Major changes incorporated in this update are requirements for a distribution of "multi-program support" costs and "other" costs (e.g., supplies, materials, equipment, and minor contracts) to benefitting programs. KSC has previously submitted comments on these changes to MSF on the draft manual dated May 15, 1973, and recommended changes are incorporated in this issue.

There is no significant impact on this Center. This directive will be distributed to the first and second level directorates, and to those offices having a significant involvement in the Institutional Base Work Package System.

William H. Rock
William H. Rock

Concur:

G.A. Van Staden JAN 18 1974
G.A. Van Staden
Director of Administration

OFFICE OF MANNED SPACE FLIGHT

**M-D MR 1200.160
DECEMBER, 1973**

**INSTITUTIONAL BASE WORK PACKAGE
SYSTEM DIRECTIVE**



**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON D.C. 20546**

INSTITUTIONAL BASE WORK PACKAGE

● SYSTEM DIRECTIVE NO. 1

TO: Distribution

FROM: *Harry N. Gorman*
For Associate Administrator
for Manned Space Flight

SUBJECT: Directive for Work Package System

This Directive establishes the Manned Space Flight Institutional Base Work Package System, which will provide a uniform system for management of Manned Space Flight institutional resources.

This Directive is not to be rewritten or issued in any other form. However, the requirements set forth herein may be reflected in subsidiary documents issued by Field Installations in implementing the Work Package System.

Suggestions for revisions in the forms, the instructions, or the content of the document should be forwarded to the Director of Administration, MSF, NASA Headquarters.

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CHAPTER 1: INTRODUCTION

100 PURPOSE

The purpose of the Directive is to establish the Manned Space Flight Institutional Base Work Package System which will provide a uniform system for the management of Manned Space Flight institutional resources.

101 SCOPE

This Directive applies to the management of institutional resources at the three Manned Space Flight Field Installations.

102 CONCEPT

The Institutional Base Work Package System provides the essential resources information to:

1. Develop requirements
2. Plan the utilization
3. Allocate the resources
4. Provide control
5. Facilitate management decisions
6. Report on accomplishments

The System is oriented to provide the effective utilization of in-house resources to achieve the program objectives.

103 INSTITUTIONAL MANAGEMENT RESPONSIBILITIES

1. The Associate Administrator for Manned Space Flight exercises institutional management authority over the MSF field installations. He allocates and reprograms resources (manpower and funds) as required to meet approved objectives. He reviews all planned project assignments to MSF field installations initiated by other (non-MSF) Program Offices to ensure complete evaluation of mission and resource requirements and reaches agreement with other Program Offices on the level of support for their projects at the MSF field installations.
2. The Directors, MSF field installations manage the institutional resources for their respective Centers. They are responsible for establishing internal procedures for planning, utilizing and reporting the institutional resources in accordance with the Work Package System.
3. The Office of Manned Space Flight Program Directors are responsible for the review of Work Packages in support of their respective programs for balance and adequacy of institutional support.

4. The other Program Associate Administrators review Work Packages in support of their respective programs for balance and adequacy of MSF institutional support and reach agreement with AA/MSF on the level of this support.
5. The Director, MSF Administration Directorate, is the "Work Package Manager" responsible for operation and maintenance of the MSF Institution Base. He issues Work Package "Calls" to the MSF field installations, coordinates institutional resources with MSF Program Offices and other NASA Program Offices, and analyzes the effectiveness of the Work Package System.

104 ILLUSTRATION OF WORK PACKAGE SYSTEM PROCESS

Figures 1a and 1b provide a brief overview of the Work Package System.

105 RELATIONSHIPS

The Work Package System is a vital cog in the MSF management system interfacing with a number of other plans and systems both within MSF and the agency. A brief explanation of relationships of the Work Package System with other important units is given below:

1. Direct Programs - The Work Packages contain the distribution of institutional resources to benefitting programs and include a description of the in-house activities, including milestones and schedules, where appropriate, that support the direct programs.
2. Development, Test and Mission Operations (DTMO) Program - The Work Package System is the prime document by which DTMO resources are planned, justified, authorized and reported. The Work Packages form the basis for the DTMO Program Approval Document and Program Plan.
3. Program Operating Plans (POP) - The Work Packages are supplements to the POP's and are prepared in the same time frame as the POP's.
4. MSF and other NASA Program Approval Documents and Program Plans - The Work Packages reflect the MSF institutional resources presented respectively in MSF and other NASA PAD and Program Plan as supporting in-house resources.
5. Tripartite Agreements - The Tripartite Agreements establish the levels of institutional resources support to other NASA Programs for the CFY and BY which are reflected in the Work Packages.
6. Institutional Management System (IMS) - The Work Package System is the method by which MSF implements IMS. The Work Packages establish the organizational entries for IMS data reporting and present data in the IMS format, i.e. Base Support and Program Support by Program.

7. Management Reporting - The Work Packages present the field installations institutional resource requirements by organizational entity and benefitting program. Actual costs of performance and manpower utilization is reported on a monthly basis in the MSF Financial Highlights report, MSF Report of Support Contractor Manpower, and NASA Financial and Contract Status Report. The Analysis of In-House Manpower Requirement, NASA Form 918, and Analysis of Service Contracts, NASA Form 1150, reports contain compatible information from the Work Packages.

WORK PACKAGE MANAGEMENT SYSTEM PROCESS

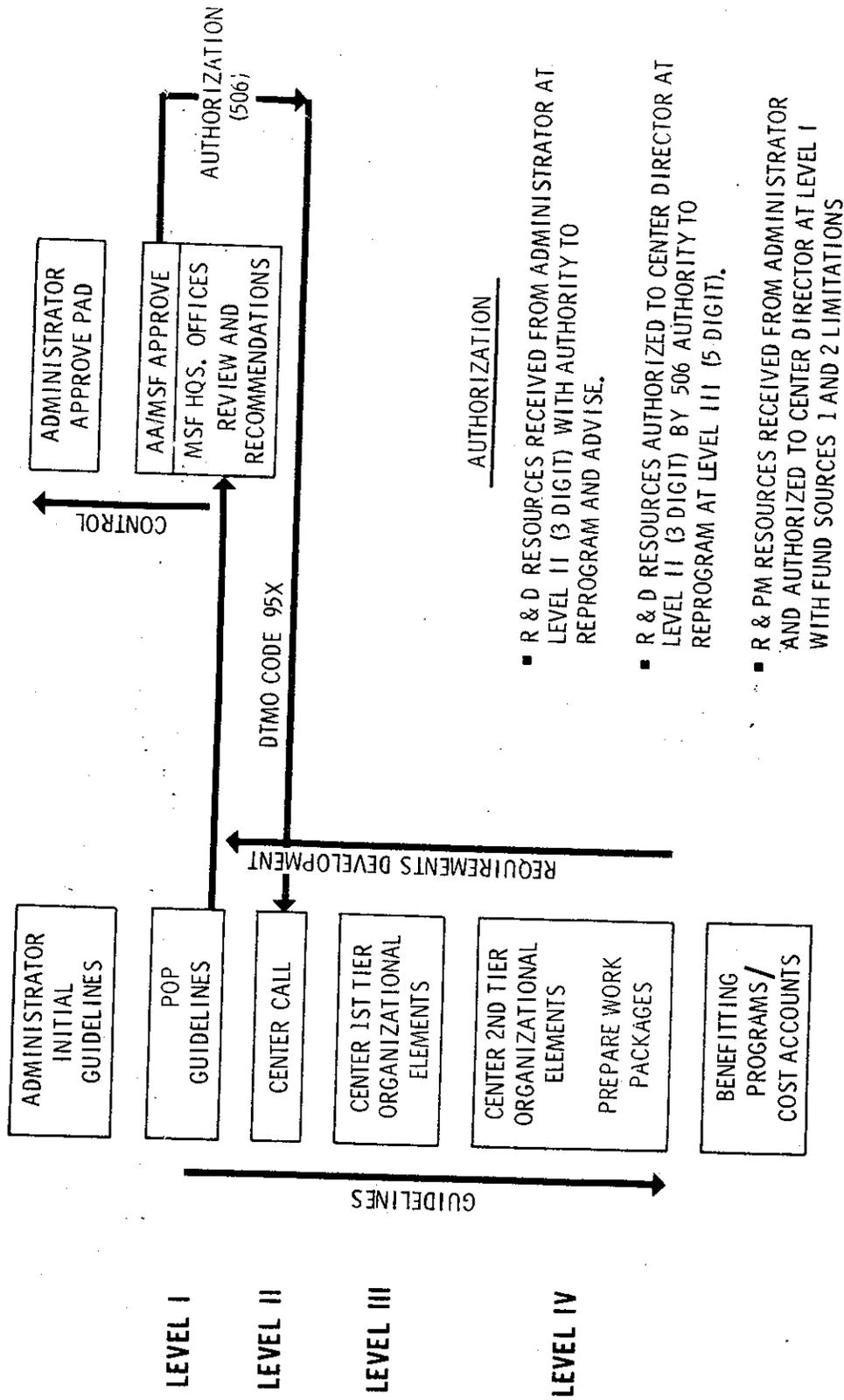


FIGURE 1a

WORK PACKAGE MANAGEMENT SYSTEM PROCESS

- **REQUIREMENTS PROJECTIONS**
 - OMSF GUIDELINES IN POP
 - CENTER DIRECTOR GUIDELINES TO SUBORDINATE ORGANIZATIONS
 - WORK PACKAGES FORMULATED AT LEVEL IV FUNCTIONAL ORGANIZATION BY BENEFITING ACTIVITY
 - CURRENT YEAR - SEAF ANNUAL (NARRATIVE OF BASELINE)
 - BUDGET YEAR - ANNUAL (NARRATIVE OF BASELINE DIFFERENCES)
 - BUDGET YEAR -1 - ANNUAL (NARRATIVE OF BASELINE DIFFERENCES)
- **APPROVAL**
 - WORK PACKAGES REVIEWED THROUGH ALL LEVELS OF CENTER MGT
 - CENTER DIRECTOR APPROVES AND SUBMITS TO MSF HDQTRS
 - OMSF PROGRAM OFFICES REVIEW
 - AA/MSF MARK UP
 - PAD APPROVAL BY AD
 - AA/MSF APPROVES RESOURCES WARRANT AND WORK PACKAGE (W/P)
 - CENTER DIRECTOR ALLOCATES RESOURCES TO WORK PACKAGE MANAGER
- **REPORTING**
 - INTRA-CENTER REPORTS AS REQUIRED BY CENTER SYSTEM
 - RESOURCE UTILIZATION REPORTED AGAINST BENEFITING PROGRAM
 - MONTHLY STATUS REPORT - MANPOWER/DOLLARS/NARRATIVE (DIFFERENCES ONLY)
 - QUARTERLY PROGRAM REVIEW - MANPOWER/DOLLARS/REPORT OF MAJOR ACCOMPLISHMENTS/
VARIANCE RESOLUTION

CHAPTER 2: DEFINITIONS

200 GENERAL

Defined in this chapter are those special terms that are used in this Directive. Definitions of the various levels of the Institutional Base Tasks are contained in Chapter 5.

201 INSTITUTIONAL MANAGEMENT

This term refers to the responsibility for making decisions with respect to the planned and actual utilization of resources necessary for the proper functioning of field installations. It places emphasis on the functions, the organization, the facilities, and the personnel and other resources necessary for the achievement of NASA's basic objectives. Within MSF, the Associate Administrator for MSF in his role as Institutional Director exercises this responsibility for the three "manned centers."

202 PROGRAM MANAGEMENT

This term refers to the responsibility for making decisions with respect to the planned and actual conduct of the specific program objectives of NASA. It places emphasis on the technical, schedule, and cost objectives of the program and the means to achieve them, including the appropriate use of field installations and contractors in industry and other government agencies. Among the decisions to be made in program management in association with institutional management are the decisions on what portions of the program will be accomplished "in-house" and "out-of-house."

203 INSTITUTIONAL FUNCTIONS

1. This term refers to all of the in-house functions of a field center. Included are all civil service personnel, all travel, all support contractors, and other activities necessary to perform these functions. Institutional functions may be divided into three categories: these are Base Support Functions, Program Support Functions, and Direct Program Functions.
2. Base Support Functions. This category includes those institutional functions which are general and administrative in nature and are required to operate and maintain an installation regardless of the programs and projects which are carried out at the installation. These functions are not directly related to programs and are classified as indirect.

Base Support functions costs include civil service personnel and travel, all base support contractors supplies, equipment, and other goods and services necessary to carry out the "General and Administrative Program" of the installation.

3. Program Support Functions. This category includes those institutional functions which provide the multi-program technical support required to carry out approved programs and projects. These functions directly support the various programs and projects but are more efficiently planned, budgeted, authorized, and controlled as specific supporting functions rather than as elements of individual programs or projects. The costs of these functions include civil service personnel and travel, multi-program support contractors, supplies, equipment, and other minor contracts that are relatable to the specific programs and projects they support either at the time the work is accomplished or through appropriate allocation methods.
4. Direct Program Functions. This category includes those institutional functions which can be directly identified with a single project. These functions directly support a single program or project and are more efficiently planned, budgeted, authorized, and controlled as an individual element of a specific program or project rather than as a supporting function. The key characteristic is that there is a clear choice by the program or project manager on the necessity, scope, or quantity of this requirement. Implied is the fact that this is a decision of program management rather than institutional management. The costs of these functions include civil service and travel, direct program support contractors, supplies, equipment, and other minor contracts.

204 INSTITUTIONAL BASE BUDGET

This term is synonymous with "Institutional Support Budget." It refers to that portion of institutional resources that are budgeted as Base Support and Program Support Functions. It does not include those institutional resources budgeted as Direct Program Functions.

205 OPERATING ACTIVITIES

This term refers to the classification on organization entities which are responsible for planning, budgeting, authorizing, and controlling the performance of institutional functions. Within a field installation, the levels of operating activities may be stipulated for the purposes of summarizing resource requirements and supporting justification data in Institutional Base Work Packages. Since organization entities are the means by which all NASA objectives are realized through the appropriate assignment of responsibilities, the levels of operating activities within a field installation may also be used for planning, budgeting, authorizing, controlling, and reporting resources requirements and cost of performance for all program management or institutional management objectives.

206 INSTITUTIONAL BASE WORK PACKAGE

This term describes the information in specified format comprising a specific Institutional Base Task. A "Work Package" provides a concise description of the functions performed, the resources required, the benefitting programs supported, and other justification data for institutional support functions performed by or in behalf of a given Task. Institutional Base Work Packages reflect all the institutional resources that are budgeted as Base Support and Program Support Functions. They also reflect separately the in-house portion of resources budgeted as Direct Program Functions.

CHAPTER 3: WORK PACKAGE SYSTEM

300 GENERAL

The Institutional Base Work Package System is the set of policies, procedures, forms, instructions, and management structure by which the Associate Administrator, Office of Manned Space Flight, and the MSF Field Installation Directors exercise a portion of their respective responsibilities for institutional management. The Work Package System provides a formal mechanism for communicating plans, authorizing resources (via NASA Form 506), justifying requirements, and establishing the baseline on which reporting of actual utilization of resources will ultimately be accomplished. The Institutional Base Work Packages are supplements to the appropriate Program Operating Plans they support and reflect current budgetary guidelines on the appropriate classification of institutional resources.

301 POLICIES

1. The MSF Institutional Base Work Package System shall be used as the formal mechanism for presenting the details of resources requirements and justifications for executing Institutional Base Work Packages to the Associate Administrator for MSF.
2. MSF Field Installation Directors will execute Institutional Base Work Packages in accordance with authorized levels of resources. Advanced approval will be obtained on any proposal to assume new work which would materially effect the distribution of resources levels described in the current work packages and/or necessitate a change in any agreements made by AA/MSF with other Programs AA's on levels of institutional base support.

302 PROCESSES

The Work Package System consists of three separate management processes. These are (1) Resources Planning, (2) Resources Authorization, and (3) Resources Reporting and Appraisal.

1. Resources Planning

- a. The centers formulate Work Packages for each Institutional Base Task in accordance with budgetary and programmatic calls issued for the respective appropriations by MSF and other program offices of NASA. They are also included in calls issued by the Associate Administrator/MSF for Institutional Base Work Packages development. Calls are normally issued twice each year concurrent with

the POP cycle, although special budgetary situations may require additional calls. Upon review and approval of center management, Work Packages are submitted to the AA/MSF.

- b. The Work Package Manager, acting for the AA/MSF, analyzes the planning data, submits appropriate portions to MSF program managers and to other program offices for their review, and presents appropriate recommendations to AA/MSF as part of the overall reviews of the MSF Program Operating Plans and Budget Estimates.
 - c. Upon notification of mark-up of the POP, the centers submit appropriate revisions of the POP and the Institutional Base Work Packages in accordance with instructions contained in the appropriate POP and Work Package Calls.
2. Resources Authorization. Upon approval of the POP and appropriate Project Approval Documents (PAD), Resources Authority Warrants (NASA Form 506) are issued to Field Installations to authorize the use of funds for executing Institutional Base Work Packages. Such use of resources is also subject to any specific controls as may be issued by the AA/MSF. The Center allocates its resources based on current work packages (unless otherwise directed by the AA/MSF).
 3. Resources Reporting and Appraisal.
 - a. Actual costs of performance are reported to OMSF monthly in the MSF Financial Highlights report and the NASA Financial and Contract Status report. Civil Service manpower utilization is reported monthly as part of the Financial and Contract Status Report Support contractor manpower utilization is reported monthly in the MSF Report of Support Contractor Manpower.
 - b. It is anticipated that appropriate accounting and reporting of cost of performance by the benefitting programs of NASA will be developed and implemented to provide for a more complete comparison with Work Package plans.

303 PROCEDURES

1. General. In response to calls from the Work Package Manager OMSF, field installations prepare and submit Institutional Base Work Packages at the levels provided in the Work Breakdown Structure for the respective centers. These work packages are summarized for each level of the structure. The

work packages and accompanying summaries are prepared in using the Institutional Base Work Package Forms.

2. Classification of Work Packages. The classification of the resources included in Institutional Base Work Package Forms will conform to:
 - a. Current policies and guidelines as shown in Chapter 4.
 - b. The Work Breakdown Structure for each center indicating the levels of operational entities, organizational summaries, and other appropriate budgetary classifications as shown in Chapter 5.
3. Institutional Base Work Package Forms. The descriptions and instructions for preparation of Work Packages using the appropriate forms are included in Chapter 6.

CHAPTER 4: BUDGETARY CLASSIFICATION OF
INSTITUTIONAL FUNCTIONS

400 GENERAL

1. The costs of institutional functions (see paragraph 203 for definition) are budgeted as Base Support, Program Support, or Direct Program. Once identified as one of those categories, the center must continue to identify future funding sources in the same classification unless a change is specifically approved by the AA/MSF.
2. Base Support functions will be budgeted in the Research and Program Management Appropriation (R&PM) as Fund Source 3, although supplemental funding for Base Support may come from FS-11. While all NASA personnel and travel costs are budgeted in R&PM as Fund Sources 1 and 2, respectively, they are also identified to Base Support, Program Support, and Direct Program functions.
3. Program Support functions will be budgeted in the Research and Development Appropriation identified as "Development, Test, and Mission Operations" (DTMO). In Fiscal Year 1973, it was identified as Fund Source 4. In FY 1974, it is identified as Fund Source 9.
4. Direct Program functions will be identified with the specific R&D budget projects of which they are integral elements. This is identified as Fund Source 4.
5. Construction of Facilities costs included in the Coff Appropriation will not be included in Institutional Base Work Packages. For budgetary purposes Coff costs will be treated as if they are "out-of-house" Direct Program costs. (See Figure 1d.)

401 BUDGETARY GUIDELINES

1. The following factors are fundamental to the determination of the classification in which a given function is budgeted:
 - a. Purpose of the function.
 - b. Type of operating activity (organization) responsible for performing the functions.
 - c. The determination of whether the necessity, scope, or level of the function is a decision of the institutional manager or the respective program managers.

Each of the above factors will be amplified and explained in succeeding paragraphs.

2. It must be recognized that the cost of a function includes all of the elements of cost necessary to perform that function. This includes support service contracts, supplies, equipment, and other minor contracts for goods and services necessary to carry out that function. (It also includes the cost of NASA personnel services and travel, but these costs are budgeted separately as Fund Sources 1 and 2, respectively, in the R&PM Appropriation.)

402 PURPOSE OF THE FUNCTION

1. There are basically only two purposes for the various in-house functions performed at the field installations. These are:
 - a. General and administrative functions which are required to operate and maintain an installation regardless of the programs and projects which are carried out by that installation. These functions are not directly related to programs and are classified as "indirect." These functions conform to the definition of base support as described in par. 203. The costs of these functions are budgeted in Fund Source 3 in the R&PM Appropriation.
 - b. Technical support functions which are required to carry out the approved programs and projects of NASA. These functions directly support the programs and projects of NASA. The costs of these functions are budgeted in the R&D Appropriation as either Program Support (Fund Source 9) or as Direct Program (Fund Source 4) depending upon other factors explained below:
 - (1) If a particular technical support function benefits more than one program as defined in par. 203-3, it will be budgeted as Program Support (Fund Source 9).
 - (2) If a particular technical support function totally and uniquely benefits one direct program of the Center as defined in par. 203-4, it will be included as Direct Program (Fund Source 4).
2. If a particular function benefits both the "general and administrative program" and the various direct programs of the Center, then each job must be classified. The costs of all jobs benefiting the general and administrative program will be included

as Base Support (Fund Source 3) and those benefitting the various direct programs will be included as Program Support (Fund Source 9).

403 TYPE OF OPERATING ACTIVITY

1. There are generally three types of operating activities (or organizations) which are responsible for planning, budgeting, authorizing, and controlling the performance of institutional support functions. These are:
 - a. General and administrative operating activities. Usually these are the center director, staff organizations, and center operations organizations who furnish installation-wide services that are necessary to operate and maintain the installation and are not directly related to the NASA programs or projects of the center.
 - b. Program support operating activities. Usually, these include center operations organizations and the specialized research, development, launch, operational, or test facilities that are organized to support the various programs and projects of the center.
 - c. Program management operating activities. Usually, these include the program or project offices as well as all other organizations that are assigned responsibility for performing specific tasks which are integral elements of individual programs or projects.
2. A specific organization of a center may be included in one, two, or all three types of operating activities, and the costs of the institutional functions for which it is responsible may be budgeted as appropriate in R&PM (Fund Source 3), DTMO (Fund Source 9), and specific direct R&D projects (Fund Source 4).

404 DECISION OF INSTITUTIONAL OR PROGRAM MANAGEMENT

1. Base Support Functions.
 - a. The scope, necessity, and level of base support functions are a decision of institutional management and are determined by such factors as the size of the installation, its population, number of active buildings, total level of programmatic activities, as well as a number of other relevant factors (geographical location, climate, age of installation, etc.). Although program managers benefit

from the "housekeeping" and general and administrative support furnished by base support functions, their contribution to the decisions on levels of base support functions is advisory.

- b. All base support functions will be budgeted in R&PM, Fund Source 3, although supplemental funding for Base Support may come from FS-11. All NASA personnel costs and travel costs are budgeted in R&PM, Fund Sources 1 and 2.

2. Program Support Functions.

- a. The scope, necessity, and level of program support functions are a decision of institutional management with the advice and counsel of the various program managers. Although a program support function directly supports the various programs and projects, the Center Director has assigned the management of this function to one organization to achieve maximum efficiency and economy in planning, budgeting, and controlling work performance. It is incumbent on this functional manager to seek the guidance of the various program managers to determine the appropriate level of support necessary to meet program requirements. However, since resources applied to program support functions compete with those applied to direct program activities, it is necessary that a proper balance be achieved.
- b. The costs of program support functions will be budgeted in R&D, Fund Source 9. In Fiscal Year 1974, within MSF, this budget classification is titled "Development, Test, and Mission Operations" (DTMO).

3. Direct Program Functions.

- a. The scope, necessity, and level of a direct program function performed in-house by the organization responsible for accomplishing the service are the decision of the program manager. Generally, the organization responsible for furnishing the service is single-program oriented and is more efficiently managed as an individual element of a specific program or project rather than as an organization which supports several programs.

- b. The costs of direct program functions are identifiable with a single project at the time budgets are developed and when contracts for the necessary resources are placed. They are budgeted as Fund Source 4 and are included in the direct project POP.

405 SPECIAL BUDGETARY CONSIDERATIONS

1. Although it is the objective of MSF to achieve the funding of all base support functions in R&PM (Fund Sources 1, 2, and 3), all program support functions in DTMO (Fund Source 9) and all direct program functions in R&D (Fund Source 4), budgetary considerations during the transitional years have required exceptions. The MSF centers were providing rapidly growing support to the non-MSF programs from program support functions, and in some instances, direct program functions were being included in program support budgets. Exceptions to the basic guidelines may still be required, but such exceptions must be specifically authorized by the AA/MSF.
2. During the fiscal year of program execution, unexpected and unbudgeted requirements may arise which cannot be met within the budgetary limits already established for a program support activity. If approved, such requirements may be met by reprogramming between direct projects and DTMO, or by funding the requirement from the direct project which benefits. Except for meeting the requirement by shifting priorities within DTMO, such requirements must be presented to the AA/MSF for approval and authorization of appropriate method of funding.

CHAPTER 5: WORK BREAKDOWN STRUCTURE

500 GENERAL

1. The Institutional Base Work Breakdown Structure is the classification in which Institutional Base Work Packages are summarized and presented. The structure is designed to provide for the unique organizations and functions existing at the three MSF centers and the assembly and summarization of the resources in terms of a common structure at the higher levels.
2. There are five levels in the MSF Work Breakdown Structure, each of which is defined in succeeding paragraphs.

501 LEVEL I - FUND SOURCE

1. Institutional Base Work Packages are summarized to the Fund Source levels as follows:
 - a. Research and Program Management (R&PM), Fund Sources 1, 2, and 3.
 - b. Development, Test and Mission Operations (DTMO), Fund Source 9.
2. Separate Work Packages are prepared when direct program funds are budgeted or authorized for financing institutional functions.

502 LEVELS II AND III - OPERATION AND SUBOPERATION

1. Level II consists of the standard operational classification of all institutional support activities found at the three field centers. Level II is subdivided into suboperational classifications for each center which are equivalent to the high level organizational entities of each center, generally the directorate level or equivalent.
2. Levels II and III are classified as follows:
 - a. Research and Test Operations. This classification includes the operation of the specialized research, development, engineering, and test facilities and related in-house effort necessary to support the program and project objectives of NASA. Level II is subdivided into the following suboperational classifications:

- (1) Engineering and Test. This provides for engineering and test support of programs in the various disciplines of aero-aerodynamics, astronautics, astronics, propulsion and power, structures and mechanics, space environment, crew systems, avionics systems, tracking and communications, control systems, experiment systems, and advanced planning and design.
 - (2) Applications and Science. This provides for support in the various disciplines of physics, astrophysics, geophysics, geology, geochemistry, earth resources technology, mapping sciences, applications sensor development, data handling techniques, pattern recognition, and other related disciplines.
 - (3) Life Sciences. This provides for support in the various disciplines of biomedical research, bioengineering systems, health services, and related disciplines.
 - (4) Reliability, Quality Assurance, and Safety. This provides for the specialized services in the disciplines of reliability, quality assurance, and safety.
- b. Crew and Flight Operations. This provides for the in-house crew operations and flight operations activities using specialized facilities in support of the programs and projects of NASA. Level II is subdivided into the following suboperational classification:
- (1) Flight Crew Operations. This provides for in-house support of crew training and simulation activities, crew procedures activities, crew integration activities, astronaut support activities, and aircraft operations.
 - (2) Flight Operations. This provides for the in-house support of mission planning support activities, flight control support activities, and data techniques laboratory.
 - (3) Mission Control. This provides for in-house support of the mission control center including the real-time computer complex and communications and terminal system.
- c. Operations Support. This provides for the various technical and administrative support services necessary to operate and maintain on-site and off-site MSF installations:

- (1) On-site Operations provides for overall facility services, logistical services, technical services, administrative support services, and computation and analysis services.
 - (2) Off-site Operations provides for maintenance and operation of test and production facilities and administrative and technical support at White Sands Test Facility, Earth Resources Lab, Mississippi Test Facility, Michoud Assembly Facility, Slidell Computer Complex, and Western Test Range.
- d. Launch Systems Operations. This provides for in-house support of all launches and includes maintenance and operations of launch facilities, support of integration and checkout of vehicles and payloads, operation of ground support equipment, and logistics support. The two suboperational classifications are:
- (1) Mechanical Ground Systems. This provides for operation and maintenance of launch complex facilities and related equipment such as mobile transporters, the converter compressor facility, propellant loading systems, pneumatics, and vehicle assembly building adjustable work platforms.
 - (2) Electrical/Instrumentation Systems. This provides for the operation and maintenance of electrical electronic and launch instrumentation systems such as automatic checkout equipment, operational voice and television communications, measurements, telemetrics, and other related systems.
- e. Administration and Management. This provides for the top decision-making functions at the field installations and those activities supporting the operation of the installation and its programs. The suboperational classification is:
- (1) Center Management. This provides for the Center Director and staff and offices which indirectly support the program activities, such as personnel, legal, management analysis, financial management, etc.
- f. Program Management. This provides for those offices which are responsible for managing the programs and

projects of NASA at the field installation level.

- g. Memo Accounts. This provides for the Institutional Base Work Package which contains a separate summary of NASA personal services costs (Fund Source 1) and travel costs (Fund Source 2).

503 LEVEL IV - INSTITUTIONAL BASE TASK

The Institutional Base Task corresponds to the organization level at the field installation that is responsible for performing the institutional functions and is the lowest level at which Work Packages are prepared. Current Institutional Base Tasks for the three field installations are reflected in Figures 5a, 5b, and 5c.

504 LEVEL V - BENEFITTING PROGRAMS

1. This is the classification of MSF and non-MSF programs which represent the NASA program objectives that benefit from performance of institutional functions. These are reflected in Institutional Base Work Packages. The major classification is uniform for all centers but "subprograms" should be added at a center to identify significant benefitting subsidiary classifications. For example, Mission Systems & Integration may be divided into project classifications of Sortie Lab, Payloads, CVT or Space Tug. Similarly, other NASA programs may be sub-classified by UPN, such as Earth Observations, Shuttle Payload Def., Lunar Science or HEAO.
2. The current uniform classification of programs is reflected in Figure 5d. This structure includes "Multi-program Support" as a "non-add" benefitting program. This classification is provided so that each organization may identify on an Institutional Base Work Package the manpower equivalents and costs of program support functions which cannot initially be identified with the benefitting programs of NASA but which must be allocated to these programs on a uniform and consistent basis.

505 RELATIONSHIPS

1. The relationship of the levels of the work breakdown structure to the Institutional Base Work Packages to the MSF budget structure is as follows:

<u>LEVEL</u>	<u>WBS</u>	<u>BUDGET STRUCTURE</u>	<u>EXAMPLE OF BUDGET STRUCTURE</u>
I	FUND SOURCE	PROGRAM	R&PM, DIMO
II	OPERATION	PROJECT	951
III	SUBOPERATION	SYSTEM	951-17
IV	TASK	ORGANIZATION	951-17 PLUS CENTER ORGANIZATION CODE

2. The benefitting programs of Work Packages are expressed in the same classification used in NASA budget estimates.

**MANNED SPACE FLIGHT
INSTITUTIONAL BASE WORK BREAKDOWN STRUCTURE**

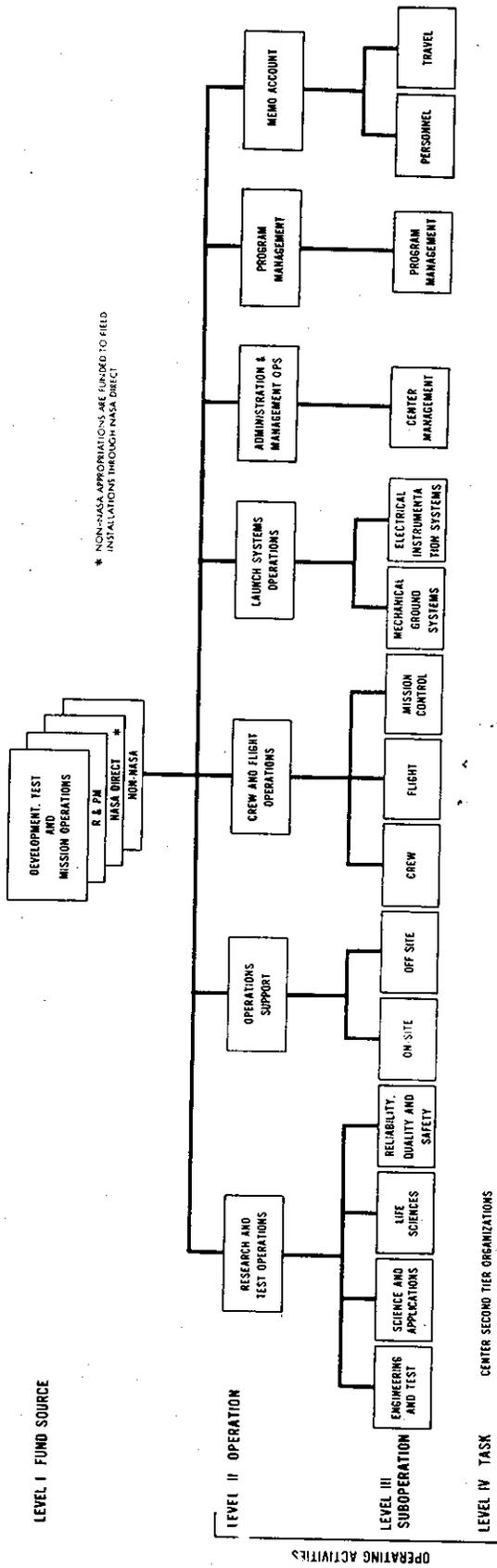


FIGURE 5

LYNDON B. JOHNSON SPACE CENTER INSTITUTIONAL BASE WORK BREAKDOWN STRUCTURE

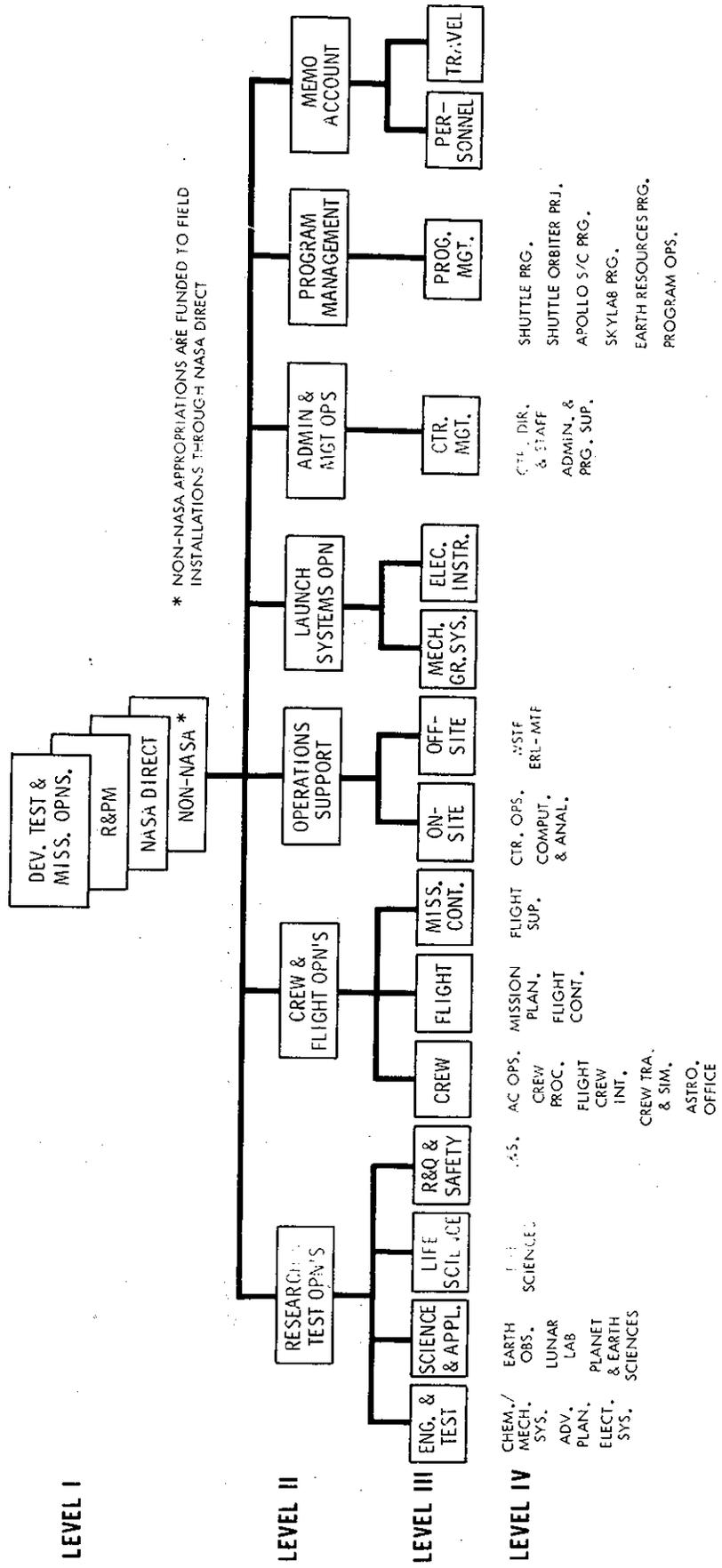


FIGURE 5a

GEORGE C. MARSHALL SPACE FLIGHT CENTER INSTITUTIONAL BASE WORK BREAKDOWN STRUCTURE

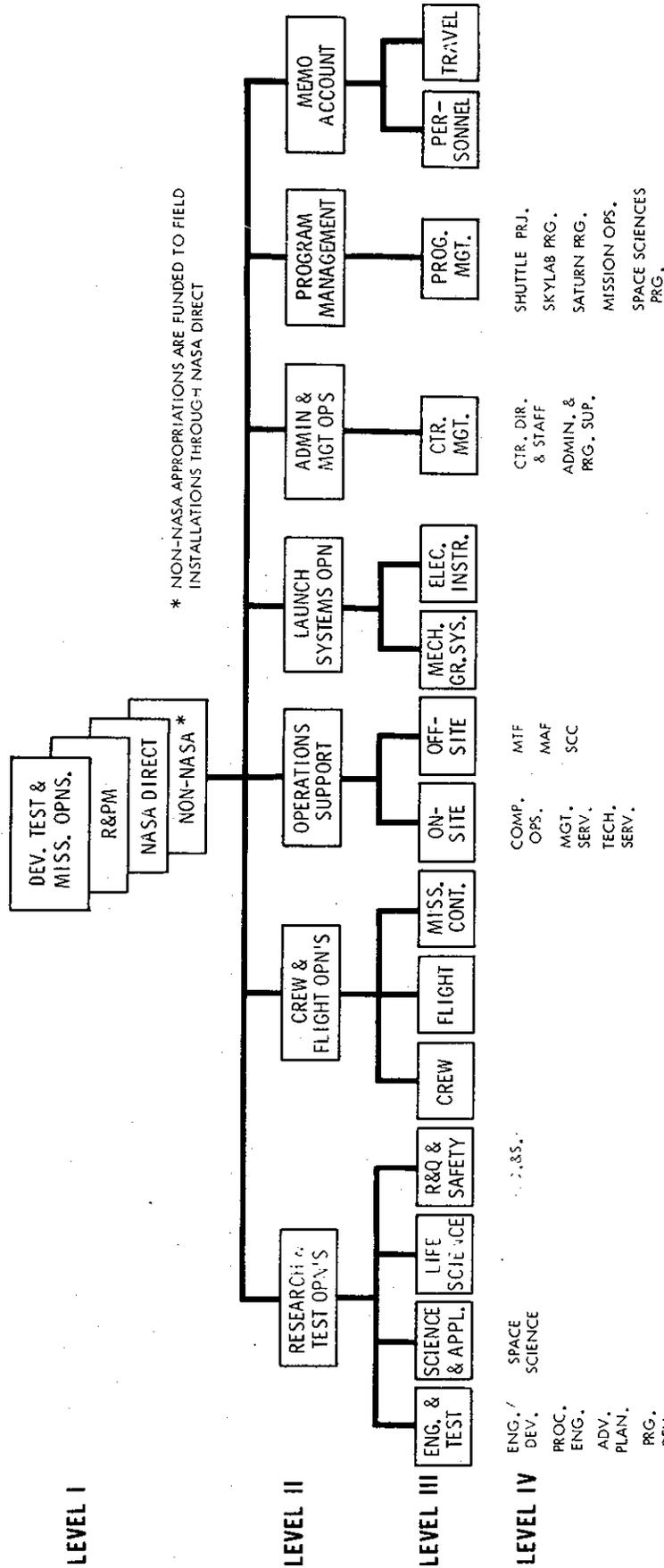


FIGURE 5c

LEVEL V

BENEFITTING PROGRAMS

MSF	OTHER NASA	*NON-NASA
APOLLO	APPLICATIONS	DOD
SKYLAB	AERONAUTICS & SPACE TECHNOLOGY	HUD
SPACE SHUTTLE	SPACE SCIENCE	HEW
APOLLO/SOYUZ TEST PROJECT	TRACKING & DATA ACQUISITION	DOT
MISSION SYSTEMS AND INTEGRATION	TECHNOLOGY UTILIZATION	COMMERCE
SPACE LIFE SCIENCES		
ADVANCED MISSIONS		
GENERAL & ADMINISTRATIVE		
(MULTI-PROGRAM SUPPORT)		
(NON-ADD)		

*To be shown as reimbursable under appropriate NASA Program Office.

Figure 5d

CHAPTER 6: WORK PACKAGE FORMS AND INSTRUCTIONS

600 INSTITUTIONAL BASE WORK PACKAGE

1. The Institutional Base Work Package forms are designed to provide an integrated set of Work Packages and summaries which contain a concise description of the functions performed, the resources required, the benefitting programs supported, and other justification data for those institutional functions included in institutional base budgets and direct program budgets. These data and justifications are required to support personnel and fund requests included in Program Operating Plans and budget estimates and to provide the basis for authorization of resources used in the performance of these activities.
2. Each Center will prepare a set of forms for their respective Institutional Base Operating Activity identified as Level IV and reflected in Figures 5a, 5b, and 5c, as well as summaries of these Tasks at Level III and Level II. Center-wide summaries will also be prepared in accordance with these instructions. See Figure 6a to identify the forms that are used for the various levels of the work breakdown structure.

601 DESCRIPTION OF FORMS

1. WP Form 1. This form provides for a summary of resources requirements at Levels I, II, and III.
2. WP Form 2. This is the basic form reflecting the summary of resources necessary to accomplish the Institutional Base Work Package at Level IV. It is also used for summaries of work packages at Level III.
3. WP Form 3. This form reflects additional support contractors in those instances where more than the two contractors reflected on WP Form 2 are involved.
4. WP Forms 4a and 4b. These forms are used to reflect the distribution of man equivalents (Form 4a) and costs (Form 4b) to the benefitting programs.
5. WP Form 5. This form is used for a description of functions performed by the operating activity and a description of program activities for each of the benefitting programs.

WP FORMS USED FOR

WORK PACKAGE PREPARATION

<u>LEVELS</u>	<u>WBS</u>	<u>WORK PACKAGE</u>	<u>WP FORM 1</u>	<u>WP FORM 2</u>	<u>WP FORM 3</u>	<u>WP FORM 4</u>	<u>WP FORM 5</u>
I	FUND SOURCE	CENTER-WIDE	X			X	
II	OPERATION	PROJECT	X			X	
III	SUBOPERATION	DIRECTORATE LEVEL	X	X	X	X	
IV	TASK	DIVISION LEVEL		X	X	X	X
V	BENEFITTING PROGRAM	BENEFITTING PROGRAM					X

Figure 6a

602 DEFINITION OF TERMS

1. Man-Equivalent. Personnel numbers are expressed in terms of man-equivalent, which is the number of hours worked in a given time period divided by the normal hours paid in that time period adjusted for nonwork time (leave). This relationship may be expressed as follows:

$$\text{M.E.} = \frac{\text{Hours Worked}}{\text{Normal Hours Paid}} \times \left(1 + \frac{\text{Leave Hours}}{\text{Hours Worked}} \right)$$

2. Civil Service. Civil Service man-equivalents include only those classified as permanent. Do not include any estimate for overtime and do not include temporary (full-time), reimbursable detailees (including military), Co-ops, part time employees, summer hires, and special personnel such as Vocational Opportunity Employees (VOE) and Public Service Career (PSC). It is recognized that reports of actual man-equivalents worked will include all classifications of personnel as well as overtime.
3. Support Contractor. This includes all industrial contractors who are supporting or assisting an operating activity in the performance of one or more in-house institutional functions that are (or should be) included in Institutional Base budgets (R&PM and DTMO). It will also include any support contractors under the provisions or paras. 405-1 and 501-2. Support contractor man-equivalent estimates will include overtime. Support contractor costs will represent total cost including provisions for fee.
4. Other Costs. This includes costs of supplies, equipment, minor contracts for goods and services and costs of goods and services received from a "service center" for which the recipient operating activity must furnish the funds. It does not include costs of NASA personnel compensation (Fund Source 1) and travel (Fund Source 2) which will be included in a separate work package (see para. 502-2f). However, Fund Sources 1 and 2 costs may be shown separately on each Work Package at the option of the Center.

603 FORM PREPARATION

1. Summary of Resources by Budgetary Classifications (WP Form 1). This form is used for summaries of resources necessary to accomplish institutional functions summarized to Levels I, II, and III for the appropriate budgetary classifications (Fund Sources). It covers the Current Fiscal Year (CFY), subdivided

by half-year, the Budget Year (BY), and the Budget Year plus one (BY + 1).

- a. Headings. Enter CFY (e.g., 1973), date of preparation, and organizational or other appropriate designation for the level of work package summary being prepared. Enter POP number (e.g., 73-1C).
- b. Man-Equivalent. Enter civil service and support contractor man-equivalents for the time periods specified. Note that the man-year equivalent reflected in the Total CFY column is the average of the 1st half and 2nd half man-equivalent entries. Support contractor entries represent the summary of man-equivalents funded by R&PM for base support functions, DTMO for program support function, and Direct Program for those support functions being financed under the provisions of par. 501-2.
- c. Total Costs. Enter total costs for each column classified as follows:

<u>LINE</u>	<u>TITLE</u>
1a	R&PM: Support Contractor
1b	Other Costs - F.S. 3
2a	Personal Service - F.S. 1
2b	Travel - F.S. 2
3	Total R&PM
4a	DTMO: Support Contractor
4b	Other Costs
5	Total DTMO
6a	Direct Program: Support Contractor
6b	Other Costs
7	Total Direct Program

- d. Remarks. This space should be used for explanatory or amplification purposes such as identifying DIRECT Programs by fund codes with associated resources.

2. Summary of Resources - Operating Activity (WP Form 2). This form provides the forecast of manpower and costs necessary to accomplish the Institutional Base Work Package. The financing of the work package by R&PM and/or DTMO will be reflected on the same form. If any financing by sources other than R&PM and DTMO is requested or expected, a separate WP Form 2 will be used. In such instances, those support contracts involving R&PM, DTMO and Direct Programs resources will be appropriately keyed on the R&PM and DTMO WP Form 2 to indicate that there is also Direct Program funding. The Form 2 will also be used to summarize work packages at Level III.

- a. Heading. Enter CFY, date of preparation, Center, Directorate Level, and appropriate Operating Activity (Levels III or IV). Use the blank box under "Operating Activity" to identify fund source (DTMO and R&PM or Direct Program).
 - b. Civil Service - Man-Equivalent. Enter the total of civil service for this work package regardless of funding.
 - c. Support Contractor - Man-Equivalent. Enter the total of all support contractors for this work package, keeping Direct Program funds separate from MSF DTMO and R&PM.
 - d. Total Costs. Enter total costs for each time period for R&PM (Fund Source 3) and for DTMO. When the page is being used for work packages financed by other than R&PM and DTMO, enter the specific source of financing in the blank box.
 - e. Support Contractor. Enter contractor name, contract number, and the 5-digit project/system code for the R&D portion of this task. If more than two support contractors are involved, use WP Form 3 for additional entries.
 - f. Other Costs. This represents all costs other than support contractors. Enter the 5-digit DTMO code in the appropriate block (or the appropriate Direct Program fund code).
 - g. Distribution or allocation of "other" costs to benefitting programs will be accomplished using an acceptable method(s). Allocations can be made similar to the process prescribed for multi-program support.
3. Distribution of Personnel and Cost by Benefitting Program (WP Forms 4a and 4b).
- a. This form is on two pages and provides the distribution of man-equivalents, both civil service and support contractors (Form 4a) and costs, i.e., support contractor cost, other costs, and total cost (Form 4b), to benefitting programs. This form is used for all levels (I, II, III, and IV) and will equal the appropriate totals shown on the corresponding Form 1 or 2.
 - b. Enter the appropriate information in the heading block. Insert proper fund source (DTMO and R&PM or Direct Program) on the blank line in the heading. Financing by R&PM and DTMO will be reflected on the same WP form 4a. Use separate WP Form 4a for Direct Program and separate WP Form 4bs for R&PM, DTMO and Direct Program.
 - c. The "Programs" to be used are listed in Figure 5d. Each center may also insert "Subprogram" identity for significant subordinate classifications. The same sequence must be used on each WP Form 4a and 4b for all Work Packages.

- d. "Multi-program Support" program is preprinted on the form and will be used as a "non-add" benefitting program. Each operating activity will identify on this line those civil service and support contractor man-equivalents (Form 4a) and support contractor costs, other costs, and total costs (Form 4b) of multi-program support functions which cannot initially be identified with the benefitting programs of NASA but which are allocated to these programs (other than General and Administrative Program) on a uniform and consistent basis.
- e. An acceptable basis for allocating multi-program support personnel and cost at the Task level will be developed to be consistent with IMS reporting. The following method could be used in some areas. An acceptable basis for allocating multi-program support personnel and costs is to add to each direct program (all programs other than General and Administrative) the result of applying the percentage that civil service personnel identified to each program bears to the total of all direct programs. This is similar to spreading overhead costs based on direct labor. An illustration of this calculation follows:

<u>PROGRAM</u>	<u>CIVIL SERVICE</u>	<u>PERCENT</u>	<u>ALLOCATION OF CIVIL SERVICE</u>	<u>TOTAL CIVIL SERVICE</u>
APOLLO	8	16	2	10
SKYLAB	32	64	6	38
SHUTTLE	<u>10</u>	<u>20</u>	<u>2</u>	<u>12</u>
SUBTOTAL	50	100	10	60
G&A	5			5
MULTI-PROGRAM	<u>10</u>			<u>(10)*</u>
TOTAL	65			65

*Designates Non-Add"

A "table" of percentages should be calculated for each Level IV Task and also for Level III and center-wide so that allocations may be made using directorate "tables" or center-wide "tables" if allocations cannot be made at the Task level. A set of "tables" should be calculated for each time period reflected on the WP forms.

- f. Once these tables of percentages are calculated, they can be used to allocate both multi-program support personnel and costs for each Institutional Base Task. Do not show any multi-program personnel or costs on the "Direct Programs" funded work packages.
 - g. Distribution or allocation of "other" costs to benefitting programs will be accomplished using an acceptable method (s). Allocations can be made similar to the process prescribed for multi-program support.
4. Description of Functions and Program Activities (WP Form 5). This narrative data provides essential justifications for the resources stated on the previous pages. A concise description of the functions to be performed is entered in the top section. The application of these functions to specific programs is shown in the bottom section. Significant milestones, scheduled items, etc., will be included when applicable.
- a. Within the "Description of Functions Performed" block of WP Form 5, identify the functional responsibilities of the organization(s) included in each work package. This description should parallel those contained in the Center Organizations and Functions publication and include the purpose as well as the function of the organization. This descriptive material provides the backup for the program activities to be next portrayed.
 - b. Within the "Description of Program Activities" block of WP Form 5, structure the descriptive material in the following fashion:
 - (1) Describe the activities performed for each program (as listed on WP Form 4) that is supported or benefited by the Operating Activity.
 - (2) Segregate the above description by those activities performed by Civil Service personnel and those activities performed by support contractors.
 - (3) Describe separately the activities performed by each support contractor. Relate support contractor activities to major program and/or management events or milestones encompassed by the work package time frame. Highlight expected program accomplishments and progress by the support contractor during the time frame.
 - (4) When activities and basic functional responsibilities of civil service manpower may change because of a proposed change in contracting philosophy, this should be particularly explained.

- (5) Use a separate WP Form 5 for each different benefiting program. Copy the same "Description of Functions Performed" for each program.

604 SUMMARIES AT CENTER LEVEL

1. The following summaries will be included in the Institutional Base Work Package Submission:

- a. Cost by Fund Source, by Fiscal Year, and by Organization. This summary should be displayed as follows:

ORGANIZATION	R&PM			DTMO			DIRECT PROGRAM		
	CFY	BY	BY+1	CFY	BY	BY+1	CFY	BY	BY+1

- b. Total Cost of R&PM by Fund Source, DTMO by Project and System, and Direct Program by Project for each Fiscal Year.
 - c. Civil Service Personnel by Program and by Organization - each Fiscal Year.
 - d. Support Contractor Personnel by Contractor and by Program - each Fiscal Year (MSF DTMO and R&PM funded only).
 - e. Support Contractor Cost by Contractor and by Program - each Fiscal Year (MSF DTMO and R&PM funded only).
2. Additional summaries may be included at the option of the center.

605 ASSEMBLY OF WORK PACKAGES

1. Work packages will be assembled into a "book" which will be organized as follows:
 - a. Title page
 - b. Index
 - c. Summaries at center level.
 - d. Center - wide work package.
 - e. Work packages arranged by the Institutional Base Work Breakdown Structure, Levels II, III, and IV illustrated in Figures 5a, 5b, and 5c. WP Forms are to be included for Memo Account. These Memo Account Forms will include an average annual manpower cost involving FS 1 and FS 2.
2. The title page will contain, as a minimum, the center name, the title "Institutional Base Work Packages," the POP number, and the date.

3. Printed copies of the "book" will be printed on both sides of the page.

606 REPRODUCTION OF FORMS

1. Local reproduction of WP Forms is authorized. Titles of programs shall be preprinted in same sequence as shown on Figure 5d and sample Forms 4a and 4b.
2. WP Forms 1 through 5 are reflected in Figures 6b through 6g.

OFFICE OF MANNED SPACEFLIGHT INSTITUTIONAL BASE WORK PACKAGE				CFY:		PAGE OF		
						DATE:		
CENTER		DIRECTORATE LEVEL		OPERATING ACTIVITY				
PLAN BASED ON POP:								
DESCRIPTION				CURRENT FISCAL YEAR			BUDGET YEAR	BUDGET YEAR + 1
				1ST HALF	2ND HALF	TOTAL		
CIVIL SERVICE - MAN EQUIVALENT								
SUPPORT CONTRACTOR - MAN EQUIVALENT								
TOTAL COSTS				(DOLLARS IN THOUSANDS)				
R AND PM - FUND SOURCE 3								
R AND D - DTMO								
SUPPORT CONTRACTOR								
NAME:		R & PM	MAN EQUIV					
		DTMO						
CONTRACT NO:								
FUNDED BY: (ENTER PROJECT/ SYSTEM CODE)		R & PM	COST					
		DTMO						
SUPPORT CONTRACTOR								
NAME:		R & PM	MAN EQUIV					
		DTMO						
CONTRACT NO:								
FUNDED BY: (ENTER PROJECT/ SYSTEM CODE)		R & PM	COST					
		DTMO						
OTHER COSTS								
R AND PM - FUND SOURCE 3								
DTMO - (CODE):								
REMARKS:								
SUBMITTED		DATE	CENTER APPROVAL		DATE			
APPROVED								

OFFICE OF MANNED SPACEFLIGHT INSTITUTIONAL BASE WORK PACKAGE				CFY:		PAGE OF		
						DATE:		
CENTER		DIRECTORATE LEVEL		OPERATING ACTIVITY				
SUPPORT CONTRACTORS - CONTINUED				(DOLLARS IN THOUSANDS)				
				CURRENT FISCAL YEAR			BUDGET YEAR	BUDGET YEAR + 1
				1ST HALF	2ND HALF	TOTAL		
NAME:		R & PM	MAN EQUIV					
		DTMO						
CONTRACT NO:								
FUNDED BY: (ENTER PROJECT/ SYSTEM CODE)		R & PM	COST					
		DTMO						
NAME:		R & PM	MAN EQUIV					
		DTMO						
CONTRACT NO:								
FUNDED BY: (ENTER PROJECT/ SYSTEM CODE)		R & PM	COST					
		DTMO						
NAME:		R & PM	MAN EQUIV					
		DTMO						
CONTRACT NO:								
FUNDED BY: (ENTER PROJECT/ SYSTEM CODE)		R & PM	COST					
		DTMO						
NAME:		R & PM	MAN EQUIV					
		DTMO						
CONTRACT NO:								
FUNDED BY: (ENTER PROJECT/ SYSTEM CODE)		R & PM	COST					
		DTMO						

REMARKS:

OFFICE OF MANNED SPACEFLIGHT
INSTITUTIONAL BASE WORK PACKAGE

CFY:

PAGE OF

DATE:

CENTER

DIRECTORATE LEVEL

OPERATING ACTIVITY

DISTRIBUTION OF PERSONNEL BY BENEFITTING PROGRAM

	PROGRAM	CIVIL SERVICE MAN EQUIVALENT					SUPPORT CONTRACTOR MAN EQUIVALENT				
		1ST HALF	2ND HALF	CFY	BY	BY + 1	1ST HALF	2ND HALF	CFY	BY	BY + 1
01											
02											
03											
04											
05											
06											
07											
08											
09											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20	MULTI-PROGRAM SUPPORT (NON-ADD)	()	()	()	()	()	()	()	()	()	()
	TOTAL										

OFFICE OF MANNED SPACEFLIGHT
INSTITUTIONAL BASE WORK PACKAGE

CFY:

PAGE OF

DATE:

CENTER

DIRECTORATE LEVEL

OPERATING ACTIVITY

DISTRIBUTION OF COST BY BENEFITTING PROGRAM

	PROGRAM	CFY			BY			BY + 1		
		SUPPORT CONTRACT	OTHER COSTS	TOTAL COST	SUPPORT CONTRACT	OTHER COSTS	TOTAL COST	SUPPORT CONTRACT	OTHER COSTS	TOTAL COST
01										
02										
03										
04										
05										
06										
07										
08										
09										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20	MULTI-PROGRAM SUPPORT (NON-ADD)	()	()	()	()	()	()	()	()	()
	TOTAL									

OFFICE OF MANNED SPACEFLIGHT
INSTITUTIONAL BASE WORK PACKAGE

CFY:

PAGE OF

DATE:

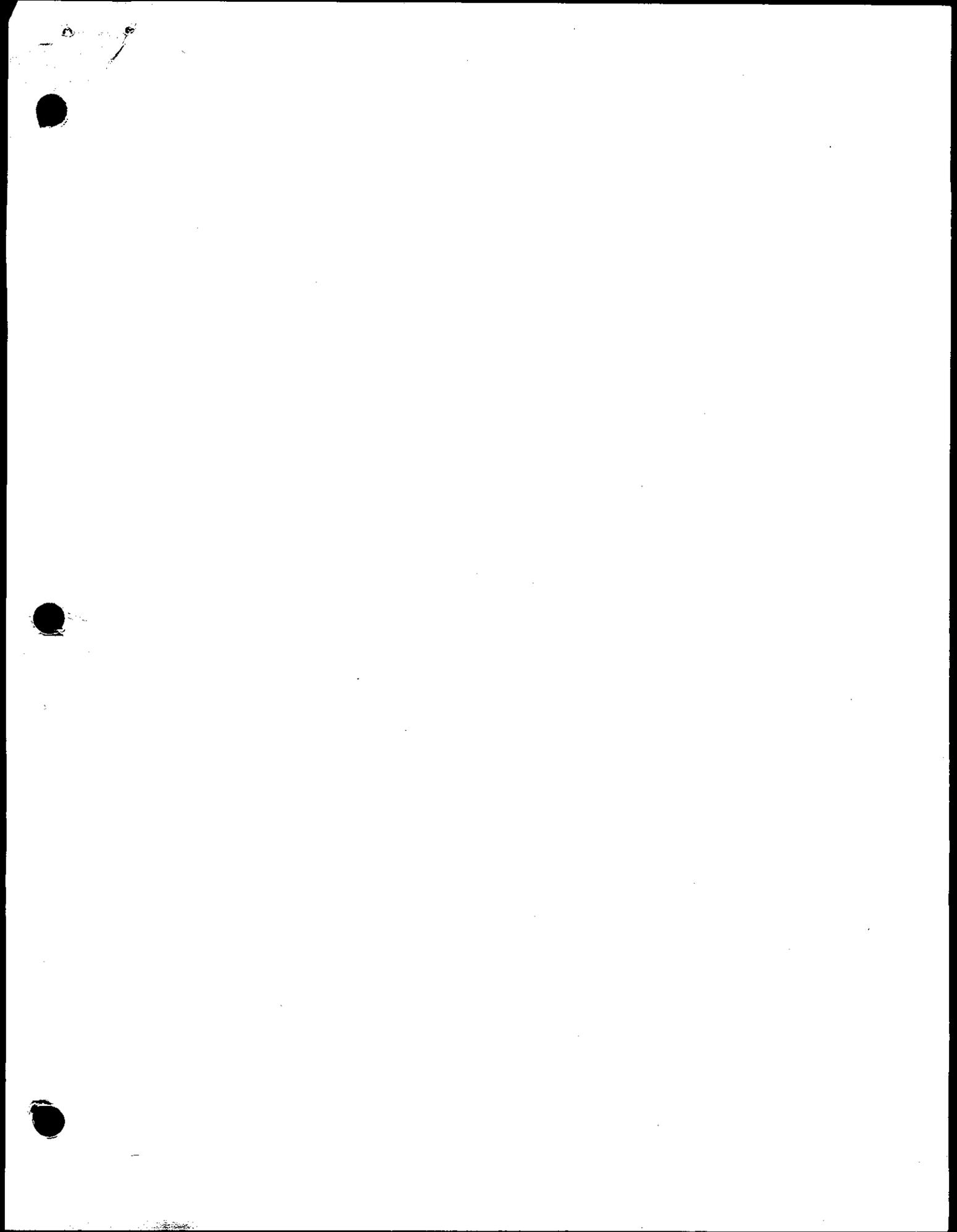
CENTER

DIRECTORATE LEVEL

OPERATING ACTIVITY

DESCRIPTION OF FUNCTIONS PERFORMED

DESCRIPTION OF PROGRAM ACTIVITIES



SEP 20 1971

AA-RQA

TO: NASA Headquarters
Attn: ML/Director, Skylab Program

FROM: AA/Manager, Apollo-Skylab Programs

SUBJECT: Proposed Skylab Program Directive, "Cleaning, Preservation, Packaging, Packing, Marking, Handling, and Shipping of Skylab Program Components, Parts, and Associated Equipment"

The KSC review of the proposed directive has been completed as requested in your letter of August 19, 1971. NMI 1410.1 and NHB 6000.1(1A) on this same subject as supplemented by the Skylab Logistics Requirements (NHB 7500.3) appear to adequately address the requirements without an additional Program Directive.

It is recommended that consideration be given to either not issuing the directive or to restructuring it to address any Skylab unique requirements needed to rectify past problems.

Although this Center does not encourage issuance of the proposed directive, detailed comments are attached.

ORIGINAL SENT BY
WILLIAM H. ROCK

Robert C. Hock

Enclosure

cc:
NASA Hq/MLQ/Director, Skylab Reliability,
Quality and Safety

- icc:
- AD/Director of Administration
- DE/Director of Design Engineering
- IS/Director of Installation Support
- LO/Director of Launch Operations
- ✓ TS/Director of Technical Support
- QA/Director, Quality Assurance
- SF/Director, Safety Office
- EX/Executive Staff

- AA-AVO
- AA-SVO
- AA-PCO
- AA-GSO

AA-RQA:RCMiller:mh: Sep. 17 2505

9/17/71
JLJoyner

9/17/71
LDuggan

OFFICIAL FILE COPY

		CONCURRENCES					
OFFICE CODE	▶ AA-PCO	AA-SVO					
INITIALS	▶ [Signature]	[Signature]	[Signature]				
DATE	▶ 9/17/71	9/17/71	9/17/71				

September 17, 1971

KSC COMMENTS ON PROPOSED SKYLAB PROGRAM DIRECTIVE, "CLEANING, PRESERVATION, PACKAGING, PACKING, MARKING, HANDLING, AND SHIPPING OF SKYLAB PROGRAM COMPONENTS, PARTS, AND ASSOCIATED EQUIPMENT"

1. Include a requirement for each Center to prepare a list of items peculiar to Skylab that are either critical, sensitive, fragile, high value, dangerous, etc., that would require special considerations in accordance with existing requirements.
2. Paragraph III.A. - Change to read, " . . . take immediate action to implement this Directive."
3. Paragraph III.B. - Change to read, " . . . subcontractor responsible for processing hardware end items shall prepare "
4. Paragraph IV.B. - Change to read, "When required, the instructions shall include the following considerations:" This rewording is needed since all instructions need not include all of the requirements of paragraph IV.B.
5. Paragraph IV.B.4. - The first sentence should be deleted and the second changed to read, "Inspection requirements should include " Also, add to paragraph IV.A., "7. Quality inspection requirements."
6. Appendix A, paragraph D - Add the following, "NHB 6000.1(1A), Requirement for Packaging, Handling and Transportation for Aeronautical and Space Systems Equipment and Associated Components; and MSFC SE-014-022-24, Cleanliness Requirements for Kennedy Space Center Operations Skylab - 1 Hardware."



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

cc: IN
10/22

8020-1

OCT 19 1970

REPLY TO
ATTN OF: AA-RQA

TO: NASA Headquarters
Attention: Apollo Program Director, MA

FROM: Manager, Apollo-Skylab Programs, AA

SUBJECT: Proposed Apollo Program Directive on Technical Support for
Resolving Technical Problems

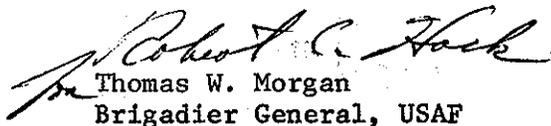
REFERENCE: MA letter to AA, October 14, 1970, same subject

As requested in the referenced letter, KSC has completed its review of draft #10 of the proposed subject directive. The following specific comments are offered for your consideration:

1. KSC plans to initiate the documentation system (i.e., requests for technical assistance on significant technical problems from the design centers) at receipt of hardware. The subject and purpose of the proposed APD should be changed to reflect this system.

2. Reference paragraph III.A.6.: At KSC the review of test data is normally an engineering rather than a quality function. The second sentence of this paragraph should be rewritten as follows: "As appropriate, the cognizant test engineer and reliability and quality assurance representative . . . findings."

In general, we find that most of the requirements imposed by this directive are already being met through existing program directives, management instructions, intercenter agreements and procedures. The attached "KSC Implementation of Proposed APD" iterates this general observation by describing the current documentation in effect for problem reporting and resolution at KSC, as well as identifying additional documentation required to fully comply with the proposed APD. The revised KSC plans to implement the APD will be transmitted as they are completed which should occur around October 23, 1970.


Thomas W. Morgan
Brigadier General, USAF

TS-01020-7

Enclosure:

(1) KSC Implementation of
Proposed APD

cc:

Manager, Saturn Program, PM-SAT-MGR, MSFC (w/cy of enc)
Manager, Apollo Spacecraft Program, PA, MSC (w/cy of enc)

KSC IMPLEMENTATION OF PROPOSED APD, "TECHNICAL SUPPORT FOR RESOLVING SIGNIFICANT TECHNICAL PROBLEMS FROM INITIATION OF PAD TESTS TO MISSION COMPLETION"

1. Reference paragraph II: The KSC launch team is responsible for resolving technical problems when they occur to the extent specified in KMI 1058.1, "KSC/MSFC Memorandum of Relationships" and KMI 1058.3, "MSFC/KSC Relations Agreement." KSC points of contact for requested MSFC and MSC real time technical assistance on significant technical problems will be designated in the intercenter working agreements now being formulated. KSC Design Engineering (DE) support for the launch team is documented in the "Design Engineering Support Plan for CDDT, CD and Launch Damage Assessment." This plan is being revised to comply with the time frame and documentation requirements stipulated in the proposed directive. This plan also establishes points of contact for DE assistance to the launch team.
2. Reference paragraph II.A.: Necessary KSC engineering support, both center and contractor, during space vehicle processing is inherent in our launch team organization. The scope of this support is necessarily keyed to our space vehicle processing schedule. Engineering support to the Design Engineering points of contact will be delineated in the support plan discussed in paragraph 1. above.
3. Reference paragraph II.B.: At KSC each contractor and Center system engineer maintains a set of drawings peculiar to his system/stage/module. These documents are purposely not centrally located, but rather are located to facilitate timely access in the various testing areas. Component and subsystem drawings of KSC designed equipment are located in the Engineering Documentation Center (EDC) where they are easily accessed by our supporting design personnel. Nonconformance data are maintained by the cognizant quality organizations, both contractor and KSC line directorate.
4. Reference paragraph II.C.: Necessary communications between MSFC, MSC and KSC already exist in the LIEF, SPAN and ALDS systems and include voice circuits, data links and OTV. Datafax/Magnafax facilities are available for document transmission.
5. Reference paragraph II.D.: All nonconformances are identified, logged, and resolved at KSC with authorized and documented corrective action in accordance with KMI 5310.11, "Nonconformance Reporting and Corrective Action System," KMI 1058.3 Appendix #4, "MSFC/KSC Subagreement for Reliability and Quality Assurance," and KMI 1058.1 Appendix #10, "MSC-KSC Relationships Subagreement on Reliability and Quality Assurance." When real time development center or KSC design agency technical assistance is requested by the launch team on technical problems, the request for technical assistance will

be documented and processed in accordance with the intercenter working agreements now being formulated and the Design Engineering support plan discussed in paragraph 1. above. Investigation of technical problems (i.e., category 1, 1S, 2 and 3 nonconformances) on KSC designed equipment includes a review of test history and prior nonconformances. The record of investigation details the results of these reviews where applicable, corrective action required and its rationale.

6. Reference paragraph II.E.: The KSC FRR implementation documentation (KPD (unnumbered), "Apollo/Saturn Flight Readiness Reviews") presently being staffed includes the reporting of significant problems, both open and closed, involving KSC designed equipment occurring since the last FRR.

7. Reference paragraph II.F.: As currently planned, issuance of the KSC Design Engineering Support Plan and the two intercenter working agreements discussed in comments 1. and 5. above complies with the requirements of this paragraph. These documents will be updated, if necessary, for each mission.

8. Reference paragraph III.A.1.: Policy concerning KSC's responsibilities for conducting the assembly, checkout and launch of flight hardware for Apollo missions is contained in the intercenter agreements, KMIs 1058.1 and 1058.3, and KPD 11A, "Preparation and Management of Kennedy Space Center Test and Checkout Plans and Procedures."

9. Reference paragraph III.A.2.: Configuration control requirements for KSC designed equipment are established in K-AM-03, "KSC Apollo/Saturn Configuration Management Manual."

10. Reference paragraphs III.A.3. and 4.: Reporting significant technical problems to the Apollo Program Office and to the development centers is accomplished via the daily status TWX, submission of UCRs, and submission of UCR status reports in accordance with KMI 5310.11.

11. Reference paragraph III.A.5.: Waivers on KSC developed hardware will be controlled by KMI (unnumbered), "Processing Requests for Deviation/Waiver of Design Requirements," presently being staffed. Deviations and waivers are obtained from the development centers in accordance with KMIs 1058.1 and 1058.3.

12. Reference paragraphs III.A.6. and 7.: Joint participation in resolution of technical problems is recognized as essential in maintaining an effective problem resolution system. This joint effort is inherent in the sub-agreements on reliability and quality assurance, KMI 1058.3 Appendix 4 and KMI 1058.1 Appendix 10.

13. Reference paragraph III.A.8.: Currently no requirement exists for KSC plus time support in the launch vehicle area (reference letter from

FA to LO dated October 9, 1969, subject: Orbital Support Requirements). Spacecraft support is available throughout the mission via a 24-hour monitor in the spacecraft mission monitoring area. A call roster of systems personnel is available to this monitor.

14. Reference paragraph III.A.9.: A new KSC Launch Operations Directive (LOD), "Review and Approval Control of Troubleshooting Procedures," presently being staffed, will be the KSC Launch Operations policy document on troubleshooting.

INTEROFFICE ROUTING SLIP
(DO NOT PLACE IN MAIL SYSTEM UNENVELOPED)

✓	TO	MAIL CODE	INTL.	DATE
	Raymond L. Clark	TS		
	P. A. Minderman	TS	Pass	
	Gordon Artley	TS		
	Lois J. Stanley	TS		
	Mary Jo Stevens	TS		
	Thurston McLeran	TS-RRO		
	R. M. Gramling	TS-TSM		
	Jack H. Williams	TS-NTS		
	Ernest A. Amman	TS-MET		
	Karl Sandler	IN		
	Robert E. Gorman	SO		

Comments verbally provided to Paul 9/29/70. J. Myers, AA, and photoc.

REMARKS

50-ENG advised they cannot submit comments on this till 9/30. There is a meeting tomorrow at 9.00 a.m. at which we shd have a rep.

CHECK ACTION REQUIRED

INFORMATION	SIGNATURE	NOTE & RETURN	FILE
CIRCULATE	NECESSARY ACTION	SEE ME	DESTROY
FROM		TELEPHONE #	DATE

ORGANIZATION



JOHN F. KENNEDY SPACE CENTER, NASA

KENNEDY SPACE CENTER, FLORIDA 32899

REPLY TO
ATTN OF: IN

September 25, 1970

TO: Deputy Director, Technical Support, TS

FROM: Director of Information Systems, IN

SUBJECT: "Proposed APD - Technical Support for Resolving Significant Failures and Anomalies from Flight Readiness Test to Mission Completion"

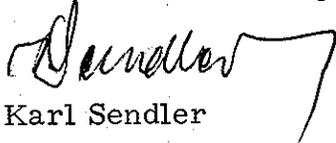
REFERENCE: (a) TS Mail Control #TS-00910-19, Dated 14 September 1970; subject as above
(b) AA memo to Distribution, Dated 9 September 1970; subject as above

Comments on the proposed Apollo Program Directive are offered.

1. Reference should be made to the NASA Headquarters directives concerning accidents/incidents.

2. In reference to paragraph III.A.5., it is suggested that data requirements coordination and data dissemination for resolution of significant anomalies be handled through normal established channels.

3. There will be an impact on communications. The degree of impact will be dependent on the quantity, type and location of new communications required.


Karl Sendler

TS 00928-4

REQUEST FOR ISSUANCE CLEARANCE

DATE RELEASED	RETURN DUE DATE
Sep. 9, 1970	Sep. 25, 1970

TO:

LO TS IS DE

RETURN COMPLETED FORM TO:

AA

FOR INFORMATION CONTACT

Paul Myers, AA-RQA, 6-2565

SUBJECT: Proposed APD - Technical Support for Resolving Significant Failures and Anomalies from Flight Readiness Test

RELEASED BY:

Thomas W. Morgan
 Manager, Apollo-Skylab

SUMMARY OF ISSUANCE to Mission Completion

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CONCUR CONCUR SUBJECT TO COMMENTS DO NOT CONCUR (State reasons below)

SIGNATURE	CODE	DATE	SIGNATURE	CODE	DATE

COMMENTS

(This area is mostly blank in the image)

TS00910-19



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

REPLY TO
ATTN OF: AA-RQA

SEP 9 1970

TO: Director of Launch Operations, LO
Director of Technical Support, TS ✓
Director of Installation Support, IS
Director of Design Engineering, DE

FROM: Manager, Apollo-Skylab Programs, AA

SUBJECT: Proposed Apollo Program Directive - Technical Support for
Resolving Significant Failures and Anomalies from Flight
Readiness Test to Mission Completion

Attached is a draft Apollo Program Directive developed by the Apollo Program Director's personnel to respond to recommendation #6 of the Apollo 13 Review Board. Fundamentally the intent is to extend the respective Centers' real time backup support previously provided only during major tests to begin at the flight readiness test and continue through the CDDT, final count and flight.

Your comments and recommendations regarding your Directorate's capability to implement the directive are requested by September 25. An intercenter and Headquarters meeting will be chaired by Captain Holcomb representing the Apollo Program Director on October 2 at KSC. Along with your comments, please designate a lead representative on this subject to attend an internal KSC review on September 29 at 9:00 a.m. in room 3225 of the KSC Headquarters Building. Other details or questions may be referred to Mr. Paul Myers, 867-2540.


Thomas W. Morgan
Brigadier General, USAF

Enclosure:
(1) Draft APD, subject as above

cc:
Director, Quality Assurance, QA (w/enc)

SUBJECT: Technical Support for Resolving Significant Failures and Anomalies from Flight Readiness Test to Mission Completion.

- REF:** (a) Apollo Program Directive No. 8A, Subj: "Apollo Flight Readiness Reviews."
(b) Apollo Program Directive No. 19C, Subj: "Apollo Mission Evaluation Reporting Requirements."
(c) Apollo Program Directive No. 33A, Subj: Center Responsibilities in the Apollo Program."
(d) Apollo Program Directive No. 44A, Subj: "Apollo Program Nonconformance Reporting and Corrective Action."

I. Purpose

This directive establishes the procedures for identification and resolution of significant failures and anomalies in flight hardware and associated GSE for each Apollo mission from initiation of Flight Readiness Test through mission completion.

II. Action Required

Each manned space flight center will maintain a team of technical personnel with a central point of contact to resolve significant failures and anomalies when they occur, from initiation of Flight Readiness Test through mission completion. Scope of the support during this period may be tailored to the level of activity being supported.

A. Each Center will ensure that necessary engineering support is made available to the technical support team leader both from Center and contractor personnel during their periods of responsibility.

B. Each Center will determine the level and location of drawings and spacecraft or launch vehicle history, both component and subsystem to be available for identification and resolution of significant anomalies.

C. Communications, as necessary, between Centers and contractors will be made available at the central point of contact, such as voice circuits, data links, operational TV and provision for rapid transmission of documents and drawings.

D. All anomalies will be identified, logged, and resolved with authorized and documented corrective action. Investigation of each significant anomaly will include a review of all test history, failures, and prior anomalies in that particular piece of equipment or subsystem, including those which have previously been corrected or explained. Qualification test results and failure history will also be reviewed. The record of investigation will include the results of the reviews, the corrective action taken, and the rationale for the corrective action. Reports of significant anomalies will be submitted per references (a), (b), and (d).

E. Each Center will present in their area of design responsibility a summary of all significant anomalies, both open and closed, at the Center and Program Director's Flight Readiness Reviews. (Reference a). An update will be presented at the Mission Director's L-2 Day Review.

F. Each Center will prepare necessary documentation to implement this directive.

III. Responsibilities

A. KSC

1. Conducting the assembly, checkout, and launch of flight hardware for Apollo missions. (Reference c).

2. Reporting occurrence of significant failures and anomalies to the Apollo Program Office and to the development center concerned.

3. Obtaining deviations and waivers from development organizations test and checkout requirements, specifications, criteria and Launch Mission Rules where required.

4. Participating with, MSC/MSFC, in the resolution of significant anomalies. Both the cognizant test engineer and reliability and quality assurance representative will review test data, component and subsystem records, and spacecraft or launch vehicle systems records, and present these findings to the project engineer, who will in turn advise his management of significant findings.

5. Providing data to MSC and MSFC as required for the resolution of significant anomalies.

6. Maintaining the Center technical support team in a standby condition during the mission phase in the event support is required for the resolution of an in-flight significant anomaly.

7. Ensuring that troubleshooting procedures are adequate and safe.

B. MSC

1. Establishing and controlling configuration of spacecraft hardware, associated software, and support equipment designed and provided by MSC, including level II approval of changes during pre-launch testing at KSC. (Reference b).

2. Approving deviations or waivers to test and checkout requirements, test and checkout specifications, criteria, and mission rules where required.

3. Determining the resolution and disposition of spacecraft significant anomalies which occur during prelaunch testing at KSC and during the conduct of the mission.

4. Reporting closeout of significant prelaunch spacecraft anomalies to the Apollo Program Office. Closeout reports on pre-launch anomalies will indicate the KSC Launch Director's concurrence.

5. Ensuring the occurrence and resolution of all in-flight spacecraft significant anomalies are made known to the Mission Director.

C. MSFC

1. Establishing and controlling configuration of launch vehicle hardware, associated software, and support equipment designed and provided by MSFC at the launch site, including level II approval of changes at KSC.

2. Approving deviations or waivers to test and checkout requirements, test and checkout specifications, criteria, and launch mission rules where required.

3. Determining the resolution and disposition of launch vehicle significant anomalies which occur during prelaunch testing at KSC and during that portion of the mission concerned with the launch vehicle.

4. Reporting closeout of prelaunch launch vehicle significant anomalies to the Apollo Program Office. Closeout reports on these anomalies will indicate the KSC Launch Director's concurrence.

5. Ensuring the occurrence and resolution of all in-flight launch vehicle significant anomalies are made known to the Mission Director.

DEFINITION OF TERMS1. Significant Failure or Anomaly

Any failure or anomaly which creates or could create a hazardous situation or condition; results or could result in a launch delay or endanger the accomplishment of a primary mission objective; would indicate a serious design deficiency; or could have serious impact on future missions.

2. Failure

The inability of a system, subsystem, and/or hardware to perform its required function.

3. Anomaly

Any deviation of system, subsystem, and/or hardware performance beyond previously established limits.

4. Corrective Action

Action taken to correct all conditions that contribute to, and are inherent in anomalies.

5. Mission Completion

For the purposes of this APD, the mission shall be considered to be completed when the flight crew and spacecraft are safely on board the recovery ship.

6. Flight Hardware and Associated GSE

Flight hardware includes all stages and modules of the space vehicle. Associated ground support equipment (GSE) is that equipment which interfaces with or is a part of the vehicle system and which actively participates in the system operation and/or test.

FROM AA-805	DATE OF DOCUMENT 9/9/70	DATE RECEIVED 9/10	NO. TS-00910-19 XXXXXXXXXX 110501
TO TS	CHECK WHETHER <input checked="" type="checkbox"/> ACTION COPY <input type="checkbox"/> INFO. COPY	ACTION COPY TO TS	
CLASSIFICATION TS	SUBSENSE DATE 9/25/70	POST OFFICE REGISTRY NO.	INFORMATION COPY TO →
			CLASSIFIED MATERIAL →
		DESTROYED (Date and No.)	NUMBER OF COPIES

DESCRIPTION (Must be unclassified)

Proposed APD - Technical Support for Resolving Significant Failures and Anomalies from Flight Readiness Test to Mission Completion

ENCLOSURES

REMARKS

REPLY NECESSARY DATE ANSWERED BY NO REPLY NECESSARY

REFERRED TO	REC'D. BY	DATE
IN		9/14
SO	Comments?	9/14
	pan	

REQUEST FOR ISSUANCE CLEARANCE

DATE RELEASED

Sep. 9, 1970

RETURN DUE DATE

Sep. 25, 1970

TO:

LO TS IS DE

RETURN COMPLETED FORM TO:

AA

FOR INFORMATION CONTACT

Paul Myers, AA-RQA, 6-2565

SUBJECT:

Proposed APD - Technical Support for Resolving Significant Failures and Anomalies from Flight Readiness Test

RELEASED BY:

Thomas W. Gorman
Manager, Apollo-Skylab

SUMMARY OF ISSUANCE TO Mission Completion

CONCUR

CONCUR SUBJECT TO COMMENTS

DO NOT CONCUR (State reasons below)

SIGNATURE

CODE

DATE

SIGNATURE

CODE

DATE

Robert E. Gorman

9/28/70

Robert E. Gorman

SO

COMMENTS

SO # 70-9-216
TS00910-19

860012

OK
R

Apollo Program Manager, AP

SEP 30 1968

Chief, Operations & Support Office, AP-OPN

Analysis of OMSF Apollo Program Directives and Implementing Action by KSC.

Reference: AP memo, same subject, dated Sept. 11, 1968.

The report requested by the reference is included in the attachment.

ORIGINAL SIGNED BY
DWIGHT SPENCER

Dwight Spencer.

Attachment:
Comments to Analysis.

CC:
AP-OPN-2

HRimmer/hmb/9-27-68

 AP-OPN-5

OFFICIAL FILE - AP-OPN-5

COMMENTS TO BOEING TIE ANALYSIS OF APOLLO PROGRAM DIRECTIVES AND THE IMPLEMENTING ACTION BY KSC.

1. Apollo Program Directive #8:

The current directive is approximately three years old. Since its publication, there have been substantial changes in philosophy of the FRR. Such changes have been distributed to the Centers in the forms of memoranda, teletype messages and "Guidelines Letters." Currently, a complete revision of the APD is being accomplished.

The references to Parts I and II of the FRR are completely out of date. We no longer conduct reviews in this manner.

Prior to each FRR, OMSF/MA issues a "Guideline Letter" which delineates the manner in which the review is to be conducted and a general outline of the subjects to be discussed. These letters supersede the APD.

K-AS-05, contrary to the Boeing TIE statement, does, in fact, support APD #8, as modified by the "Guideline Letter." The comments reflect the reviewer's lack of appreciation of the intent of K-AS-05 and the APD as well as a lack of knowledge of the subject.

No further action is recommended until we receive the new APD 8A from Hdqts.

2. Apollo Program Directive #15A:

The statement: "None of the specific requirements imposed upon KSC by OMSF APD #15A have been implemented" is completely erroneous. We are complying with specific requirements of the APD. No further action is recommended.

3. Apollo Program Directive #26B:

No comment or action is required.

4. Apollo Program Directive #37:

The BATC/TIE assessment of the requirements placed on KSC by APD37 is correct.

Concur in the BATC/TIE recommendations except as noted below.

A proposed KMI, Acquisition of Automatic Data Processing Equipment, is under development by IN. It has been reviewed by AP and found to be inadequate in dealing with Program Office responsibilities for review and evaluation of needs for program-oriented Category B equipment. Informal coordination with IN indicates that IN would be agreeable to incorporation of the APD 37 requirements in their proposed KMI. This approach seems more reasonable than have two issuances on the same subject.

Recommendations: That AP-OPN transmit by memo to IN-ADP a proposal for inclusion of APD 37 requirements into their proposed KMI.

5. Apollo Program Directive #41:

Boeing TIE is correct. KSC has taken no action to implement this APD. At this time, the Apollo Program Office is awaiting the outcome of discussions between the Center Director and the Apollo Program Director concerning the implementation of this directive.

6. Apollo Program Directive #43:

KSC is in the process of implementing this directive. Review copies have been forwarded to the operating Directorates for comment.

7. Apollo Program Directive #19:

Reference the four items reported as not being implemented:

a. The requirement for a Panel Review Board presentation is satisfied by providing a preliminary copy of the Ground Systems Evaluation Report.

b. The analysis of launch anomalies is, insofar as GSE is concerned, covered in K-AS-04.

c. The inclusion of specific references to NHB 5300.1 and the Apollo Mission Failure Contingency Plan is not considered necessary as long as the provisions of these documents are included in the KSC issuance.

8. General:

Our review of the Boeing Analysis of these APD's indicates that the Boeing analysis was conducted without benefit of contact with the Office of Primary Responsibility (OPR). Many of the Boeing comments and recommendations would have been obviated had the OPR been accorded the opportunity of providing more recent documentation and guidance to those making the analysis. It is recommended that Boeing be advised to draw on the knowledge and experience of the OPR's when making such analyses. This will improve their integration effort and reduce the review time required by the OPR's under the present system.

255-5
Hacker

UNITED STATES GOVERNMENT

Memorandum

TO : Distribution

DATE: SEP 11 1968

FROM : Executive Assistant to the Apollo Program Manager, AP

SUBJECT: Analysis of OMSF Apollo Program Directives and the Implementing Action by KSC

1. Boeing TIE is presently engaged in the subject analysis and has rendered some preliminary reports. Their reports indicate that KSC implementation of OMSF Apollo Program Directives is less than complete, and recommend specific corrective measures.

2. The following organizations are requested to review the Boeing TIE preliminary reports indicated below and advise this office as to:

- a. Whether the synopsis and statement of requirements imposed on KSC by the APD are correct and complete, and if such is not the case, identify what is in error or has been omitted; and to
- b. Concur or disagree with Boeing TIE's recommendations and comments, and the reasons therefore.

Organization

OMSF APD #'s

AP-SYS	7, 18, 23, 29, 31
AP-OPN	8, 15A, 26B, 37, 41, 43
AP-PCO	33, 36, 40
AP-RQA	32A, 44
AP-LVO	19
AP-(Noyd)	30A, 42
AP-SCO	17

3. Responses should be in this office by September 26, 1968. Copies of the Boeing TIE preliminary reports are attached hereto.

Ernest P. Swieda
Ernest P. Swieda

Attachment: Preliminary reports as stated

Distribution:

- Chief, Launch Vehicle Office, AP-LVO
- Chief, Operations & Support Office, AP-OPN
- Chief, Program Control Office, AP-PCO
- Chief, Reliability & Quality Assurance Office, AP-RQA
- Chief, Apollo Spacecraft Office, AP-SCO
- Chief, Systems Engineering Office, AP-SYS
- Mr. J. W. Noyd, AP



ROUGH DRAFT

SECTION 19

ANALYSIS OF OMSF APD #19

USE FOR TYPEWRITTEN MATERIAL ONLY

1.0 TITLE

OMSF APD #19, "Apollo Flight Evaluation Requirements"

2.0 ISSUE DATE

June 6, 1966

3.0 EFFECTIVE DATE

June 6, 1966

4.0 SYNOPSIS

This directive establishes Apollo Flight Evaluation Requirements to ensure that maximum use is made of the flight test results to enhance future flight mission success. The directive covers the requirements for:

- a. Center flight evaluation reports and presentations and their contents.
- b. Identification of all significant flight and launch active ground support hardware failures and anomalies.
- c. Determination of the cause of the failures and anomalies and the identification of corrective actions to be undertaken for subsequent missions.

5.0 RECOMMENDATIONS

The KSC Apollo Program Manager should revise K-AS-04 to correct the discrepancies noted in 8.0 below; K-AS-04 then would completely implement the requirements imposed by OMSF APD #19.

The Launch Vehicle Office (AP-LVO) should be held responsible for the implementation of OMSF APD #19.

6.0 APPLICABILITY

6.1 OMSF INSTALLATIONS

APD, KSC, MSC, MSFC

6.2 OPERATING DISCIPLINES

Data Management, Reliability and Quality Assurance, Safety, Scheduling and Program Management, Test Program

7.0 REQUIREMENTS IMPOSED UPON KSC

KSC must prepare flight evaluation reports in accordance with the general requirements of NPC 500-10, "Apollo Test Requirements", and NHB 5300.1, "Apollo Reliability and Quality Assurance Program Plan".

AUG 16 1969

7.0 Continued

Within three days after the launch of an Apollo flight, KSC must supply a teletype report to the Apollo Program Director. This report will contain a summary of space vehicle pre-launch checkout and final count-down anomalies, the initial post-launch complex status evaluations, and data retrieval status.

Within thirty days after launch, KSC must provide, to the Apollo Program Director a listing of all of KSC's significant launch anomalies, including significant malfunctions, performance deviations, and system, subsystem, and hardware failures. This report must include at least the following information:

- a. Identification of the failure or anomaly.
- b. The criticality of the anomaly and whether it had a primary or secondary effect on the mission objective.
- c. Identification of impact on the next flight.
- d. Description of the failure or anomaly, identifying the system or hardware part, the time in the mission when the anomaly occurred, and the possible mode and cause of the failure or anomaly.
- e. Identification of prior qualification or certification ground test status, and prior checkout status of the part to determine whether anomaly failure possibility was evident.
- f. Corrective action to be undertaken including identification of any required re-design as well as modifications to the qualification or certification testing and checkout activities to assure that the problem will not re-occur. Additionally, the effect of the change upon the mission, the status of the corrective action, and the anticipated close-out date for anomaly corrective action must be identified.

These listings must be used as a baseline for identification of required parts modifications and requalification requirements to follow-on flights. They must be updated as required; copies of the updated listings must be transmitted to the Apollo Program Director.

These listings must be analyzed to determine the adequacy of the actions taken relative to the next mission. These analyses then must be submitted as part of the documentation for the subsequent DCR and FRR - Part I. The results of the analyses must be summarized and presented as part of the oral presentation at the DCR and FRR - Part I.

Approximately five weeks following completion of the flight, KSC must make a presentation to the Panel Review Board based on Flight Evaluation Panel findings and current in-house activities. The review must include at least the following information:

AUG 16 1968

7.0 Continued

- a. A report on the degree to which mission objectives had been satisfied.
- b. Trajectory events evaluation.
- c. A description of major resolved and unresolved anomalies including data as described in the Anomalies Listing.
- d. An identification of major hardware changes and of checkout changes being processed by internal KSC change procedures resulting from post-flight results.
- e. Status report on post-flight testing.

Within 45 - 60 days after completion of a mission, KSC must submit a Ground Systems Evaluation Report to the Apollo Program Director. This report must include at least the following information:

- a. A chronological summary of major KSC flow events leading to the launch.
- b. Atmospheric conditions.
- c. Ground system performance and condition for next flight.
- d. Summary list of significant launch anomalies and failures and their corrective actions.

Should an Apollo mission be prematurely or unsuccessfully terminated, the requirements for security, investigation procedures, data handling, and reporting must be those established in the Apollo Mission Failure Contingency Plan.

8.0 COMMENT

OMSF APD #19 was partially implemented at KSC by K-AS-04, "Apollo/Saturn Post Launch Reports Plan", Revision 1, dated November 1, 1967.

- a. The following requirements were implemented:
 1. The "Three-day Report" specification (paragraph III.A.3.a) was completely fulfilled by K-AS-04's "Quick-look Assessment Report" (Section III).
 2. The "Failure and Anomalies Listing Report" specification (paragraph III.A.5) was completely fulfilled by K-AS-04's "Failure and Anomalies Listing Report" (Section IV).
 3. The "Ground Systems Evaluation Report" specification (paragraph III.A.7) was completely fulfilled by K-AS-04's "KSC Ground System Evaluation Report" (Section V).

8.0 Continued

4. The specification that these three reports must be prepared in accordance with NPC 500-10 (paragraph III.A) was completely fulfilled in K-AS-04's Section II (paragraphs 2.1, 2.2, and 2.3).
- b. Several requirements imposed by OMSF APD #19 were not implemented by K-AS-04:
1. The KSC presentation to the Panel Review Board (paragraph IV.B) is not mentioned.
 2. The conducting of analyses of launch anomalies and their submittal at the subsequent DCR and FRR - Part I (paragraph III.A.8) is not mentioned.
 3. The use of NHB 5300.1 as a guide for preparing KSC's reports (paragraph III.A) is not mentioned.
 4. The use of the "Apollo Mission Failure Contingency Plan" to govern security, investigation procedures, data handling, and reporting of premature or unsuccessfully terminated Apollo missions (paragraph V) is not mentioned. K-AS-04 reserves this reporting to K-AS-03, "Apollo/Saturn Failure Investigation Plan" (paragraph 1.3.5), but contains no reference to the other functions.

USE FOR TYPEWRITTEN MATERIAL ONLY

USE FOR TYPEWRITTEN MATERIAL ONLY

SECTION 37
KSC ANALYSIS OF OMSP APD #37

1.0 TITLE

OMSF APD #37, "Control of Computer Equipment Procurement Utilizing Apollo Funds"

2.0 ISSUE DATE

January 17, 1968

3.0 EFFECTIVE DATE

January 17, 1968

4.0 SYNOPSIS

This directive establishes Apollo Program Office control policy and procedures for acquisition of computer equipment to support the Apollo Program and requiring Apollo R & I funds. The Apollo Program Director will review and approve all procurements of electronic digital devices involving a memory and a processing unit, including specified peripheral equipment, whether these procurements are initial buys, follow-on buys, or leases or purchases of additional capacity to existing systems, when such procurements involve Apollo funds.

The directive is applicable to all initial or add-on purchases and leases of computer-type equipment and systems for ground and flight hardware, and to all equipment purchased or leased to increase the capacity of existing computer systems, when Apollo funds are utilized.

5.0 RECOMMENDATIONS

The KSC APM should request the Center Director to issue appropriate KSC Management Issuances implementing OMSF APD #37. These issuances should be sufficiently explicit to enable the affected KSC organizations to fulfill the requirements imposed by the directive.

The Operations and Support Office (AS-OPN) should be held responsible for the implementation of this directive at KSC.

6.0 APPLICABILITY

6.1 OMSF INSTALLATIONS

ASO, KSC, MSC, MSFC

6.2 OPERATING DISCIPLINES

Contracts and Procurement, Data Management

7.0 REQUIREMENTS IMPOSED UPON KSC

The KSC Center Director must forward to the Apollo Program Director

USE FOR TYPEWRITTEN MATERIAL ONLY

7.0 Continued

(Attn: Dir. MAT) for approval prior to executing definitive procurement action, all specified computer equipment procurements which utilize Apollo funds. The data package submitted for approval must include:

- a. A description of the equipment to be purchased or leased.
- b. An identification of the computer system(s) involved, including the necessary technical information to show the use of the equipment being procured.
- c. The justification for new procurement, as compared with the use of existing equipment, schedule considerations, and costs.

8.0 COMMENT

No KSC documentation implementing OMSF APD #37 has been noted.

USE FOR TYPEWRITTEN MATERIAL ONLY

D R A F T

TO : Mission Support Branch, AP-OPN-5

FROM : Test Plan Surveillance Branch, AP-OPN-2

SUBJECT: Boeing TIE "Analysis of OMSF Apollo Program Directives and the Implementing Action by KSC

1. General Comment

The so-called "analysis" performed by Boeing TIE indicates a complete lack of comprehension of the problem and of the methods required to solve it. There has been no contact with the "KSC Office of Prime Responsibility" to determine if there have been circumstances which have changed the requirements. Further, there appears to have been no coordination with other TIE personnel who may be knowledgeable in the areas under review.

2. Apollo Program Directive #8

The current directive is approximately three years old. Since its publication, there have been substantial changes in philosophy of the FRR. Such changes have been distributed to the Centers in the forms of memoranda, teletype messages and "Guidelines Letters". Currently, a complete revision of the APD is being accomplished.

The references to Parts I and II of the FRR are completely out of date. We no longer conduct reviews in this manner.

Prior to each FRR, OMSF/MA issues a "Guideline Letter" which delineates the manner in which the review is to be conducted and a general outline of the subjects to be discussed. These letters supersede the APD.

K-AS-05, contrary to the Boeing TIE statement, does, in fact, support APD #8, as modified by the "Guideline Letter". The comments reflect the reviewer's total lack of knowledge and comprehension of the intent of K-AS-05 and the APD as well as a complete lack of knowledge of the subject.

Had adequate, or even a token amount of research been accomplished, the reviewer would have come up with a completely different report.

3. Apollo Program Directive #15A

The statement: "None of the specific requirements imposed upon KSC by OMSF APD #15A have been implemented." is completely erroneous! The truth is that we are complying with specific requirements of the APD.

The references to K-IB-02.19 and K-V-05.19 indicate the degree to which the reviewer is completely out of touch with the real world. These documents were deleted in May of this year. In their stead, a single document, K-AS-05, has been published.

4. Apollo Program Document #26B

No comment.

5. Apollo Program Directive #41

Boeing TIE is correct. KSC has taken no action to implement this APD. At this time, the Apollo Program Office is awaiting the outcome of discussions between the Center Director and the Apollo Program Director concerning the implementation of this directive.

This is another instance in which a minimum amount of research would have revealed the status of this situation.

6. Apollo Program Directive #43

KSC is in the process of implementing this directive. Review copies have been forwarded to the operating Directorates for comment.

Again, it is evident that the reviewer is not aware of the intent of this directive. Our philosophy is that all of the basic information required of KSC is available to OMSF. Our primary response to the Mission Implementation Plan will be to supply corrections as they become necessary to the sections on "Sequence of Pre-Launch Tests" and "Launch Turnaround Plan." It is difficult to conceive of any input KSC would have to other sections of the plan.

7. Apollo Program Directive #19

Again, the reviewer does not understand how KSC operates. We do not make presentations, as such, to the Panel Review Board. Instead, we furnish the Flight Evaluation Working Group a draft copy of the Ground Systems Evaluation Report. Since KSC is not involved in the mission after lift-off, the only information we can contribute is that pertaining to the operation of KSC Ground Support Equipment during the countdown.

The analysis of launch anomalies, in so far as GSE is concerned is discussed in K-AS-04.

How can one "unsuccessfully" terminate a mission? The receiver appears to be confused about the intent of K-AS-04 and K-AS-03.

8. Conclusions

The report of the APD review indicates an extremely poor quality effort. It also reveals a very poor understanding of KSC operations and responsibilities. We do not understand how anyone could prepare such a report with as little apparent effort to research the subject matter. As far as we can determine, there was no attempt to contact responsible KSC personnel who have a knowledge of the subjects under review. The entire report appears to have been based on unwarranted assumptions, biased opinions and very incomplete information.

H. L. Blackwood
H. Blackwood

86002

OCT 21 1968

Executive Assistant to the
Apollo Program Manager, AP

Chief, Operations & Support Office, AP-OPN

Analysis of OMSF Apollo Program Directives and the Implementing Actions
by KSC.

Reference: Memo from AP dated October 8, 1968 to Distribution, subject as
above.

We have no additional comments to those previously submitted.

ORIGINAL SIGNED BY
DWIGHT SPENCER
Dwight Spencer

FTurner/fmb/10-21-68

OFFICIAL FILE - AP-OPN-5

ROUTING SLIP - AP-OPN

DATE 10/9

FILE NR. 10-45

NAME	INITIAL
<u>Spencer</u> ✓	<u>DS</u>
<u>J. Abercrombie</u>	_____
<u>R. Brooks</u>	_____
<u>H. Blackwood</u>	_____
<u>E. Bishop</u>	_____
<u>A. Taiani</u>	_____
<u>F. Turner</u>	_____
_____	_____
FILE _____	_____

✓ plb. advise if you or
OPN-2 have any more
comments.

R

ROUTING SLIP

MAIL CODE	NAME	ACTION	
AP-OPN		APPROVAL	
		CALL ME	
2.		CONCURRENCE	
		FILE	
3.		INFORMATION	
		INVESTIGATE AND ADVISE	
4.		NOTE AND FORWARD	
		NOTE AND RETURN	
5.		PER REQUEST	
		PER TELEPHONE CONVERSATION	
6.		RECOMMENDATION	
		SEE ME	
7.		SIGNATURE	

Reference: File No. 10-45

No further action is required by AP-OPN-2/5
with regard to above reference.

We will keep the Boeing/TIE study.

MAIL CODE AP-OPN-5	NAME F.E. Turner <i>FET</i>	TEL. NO. 5838	DATE 10/18/68
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ROUTING SLIP

MAIL CODE	NAME	ACTION
1.	AP-OPN-2	APPROVAL
		CALL ME
2.		CONCURRENCE
		FILE
3.		INFORMATION
		INVESTIGATE AND ADVISE
4.		NOTE AND FORWARD
		NOTE AND RETURN
5.		PER REQUEST
		PER TELEPHONE CONVERSATION
6.		RECOMMENDATION
		SEE ME
7.		SIGNATURE

1. SEE AP-OPN NOTE ATTACHED.

2. PLS ADVISE WHETHER OR NOT YOU HAVE ANY MORE COMMENTS.

NEGATORY
[Signature]

MAIL CODE	NAME AP-OPN-5	TEL. NO.	DATE 10/15/68
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UNITED STATES GOVERNMENT

Memorandum

TO : Distribution

DATE: OCT 8 1968

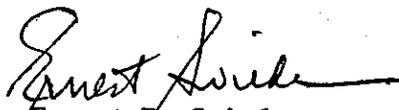
FROM : Executive Assistant to the Apollo Program Manager, AP

SUBJECT: Analysis of OMSF Apollo Program Directives and the Implementing Action by KSC

REFERENCE (A): Memo from Executive Assistant to the Apollo Program Manager, AP, to Distribution, dated September 11, 1968

1. By reference (A) you were informed that Boeing was engaged in the subject analysis and you were asked to comment upon those preliminary analyses wherein Boeing had recommended your office as the Office of Primary Responsibility. Since that time, Boeing has completed their analysis of the APD's and has submitted a final report.

2. A copy of the Boeing final report is being transmitted with this memo for your perusal. If you have any comments in addition to those you have already submitted in response to reference (A), they would be appreciated.


Ernest P. Swieda

Enclosure: (1) Boeing Report Number D2-119041-1 (1) copy

Distribution:

Chief, Launch Vehicle Office, AP-LVO
Chief, Operations & Support Office, AP-OPN
Chief, Program Control Office, AP-PCO
Chief, Reliability & Quality Assurance Office, AP-RQA
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