~~SECRET~~ SPECIAL HANDLING

MOL SYSTEM ENGINEERING

FOR THE

MANNED ORBITING LABORATORY PROGRAM

PROPOSED

DORIAN

PART II

19 April 1968

Revised
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DEPARTMENT OF THE AIR FORCE
MANNED ORBITING LABORATORY, SYSTEMS PROGRAM OFFICE (USAF)
AF UNIT POST OFFICE
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PART II

IMPLEMENTATION

1.0 INTRODUCTION

The basic approach for accomplishing the MOL System Engineering effort and preparing the related System Technical Documentation is defined in Part I of this Exhibit. Part I is an overt Management Guidance Document and is not contractually binding except as noted herein. The covert Part II of this Exhibit, together with the covert Addendum A to the covert Part II, are the contractual implementation documents. The covert Part II shall be used as the governing contractual document for the DORIAN Program.

The sections of the overt Part I to the Exhibit referenced in the covert Part II become contractual when so referenced.

2.0 APPROACH

The task, segment and data assignments defined in Part II of this Exhibit are based on the requirements defined in the System Performance and Design Requirements (SP/DR) Specifications SS-MOL-1A, dated 1 September 1966, as updated in the proposed SS-MOL-1B, dated 1 February 1968. The assignments defined in Part II will be updated concurrently with future changes to the SP/DR.

Overall schedules for development and preparation of the data and tasks required in Part II of this Exhibit will be established by the MOL Program Office in coordination with the Associate and MPI Contractors. Basic individual top function development schedules will be established by the appropriate Function Integrators in coordination with the contributing contractors to those top functions. The top function development schedules shall be compatible with the overall schedule.

3.0 DEVELOPMENT OF TECHNICAL DOCUMENTATION FOR THE MOL PROGRAM

The System Technical Documentation (STD) initially developed in the Contract Definition Phase (CDP) shall be expanded and maintained in a current status by the associate contractors in accordance with the instructions contained in Part II of this Exhibit.

The System Technical Documentation (STD) prepared for the MOL Program shall fully describe the DORIAN and non-DORIAN requirements. The STD shall initially be prepared as a single covert package of DORIAN and non-DORIAN requirements. An overt STD data package shall be prepared from this covert package. DORIAN STD which must, because of interface requirements, be covered in the non-DORIAN STD shall have suitably altered versions prepared which remove the DORIAN classification but retain the interface requirements. DORIAN STD which has no interface requirements with non-DORIAN STD shall not be converted. Suitable cover functions, function descriptions, etc., shall be used for conversion purposes.

STD prepared by non-DORIAN participants shall be integrated with the DORIAN STD to form the complete MOL Baseline by the DORIAN portion Function Integrator for each Function.

Final judgment as to the adequacy and validity of the analysis and data generated in accordance with this Exhibit is the responsibility of the MOL Program Office. The MOL Program Office, in its role of Overall System Integrator (OSI), will be responsible for timely resolution of conflicts and adjustments to contracts arising out of the performance of tasks defined in this Exhibit.

All transmittals of STD data specified in this Exhibit shall be based on a package concept of related Functional Flow Block Diagram(s)[FFBD's], Requirement Allocation Sheet(s)[RAS's], Timeline(s)[TL's], Schematic Block Diagram(s)[SBD's] and, where appropriate, related trade studies. Transmittals of one STD element shall be accompanied by the other related data elements, as noted, to insure that the recipient receives sufficient information to accomplish his task.

3.1 MOL SYSTEM FUNCTIONAL ANALYSIS EXPANSION

The MOL Associate Contractor shall perform the functional analysis and develop and prepare the STD in accordance with the direction contained in this Exhibit. The MOL Program Office and Government Agencies will assist and participate in this effort as noted.

Requirements previously specified in existing contractual documents available at the time of initial preparation of the Requirements Allocation Sheets may be incorporated by reference to the appropriate paragraphs of those contractual documents in lieu of expanded narrative detail. However, where this approach is used, the actual words of the requirements so referenced shall be made available furnished on request to and maintained in a current status for incorporation into the data packages utilized by each program participant who would normally have that portion of the STD.

Sections 3.1.1 through 3.1.13 of the covert Part II of this Exhibit define and establish the specific tasks to be accomplished and data to be prepared for each top system function. The contractor roles and responsibilities delineated herein supersede those prescribed in Section 3.1 of the overt Part I of this Exhibit.

3.1.1 Function 1.0 "Evaluate MOL System"

3.1.1.1 Function Description

The objective of this function is to provide the basis for the evaluation of the performance of the various elements comprising the MOL System and of the System as a whole. The evaluation covers a period beginning at the arrival of AGE at the launch site and ends with mission termination. This evaluation shall facilitate: (1) management cognizance of important milestones, both during and following each flight, which will enable decisions to be made on a timely basis in regard to flight program changes; (2) detection of deficiencies so that required corrective actions may be implemented; (3) determination of additions or changes which could improve future capabilities for manned or unmanned operations of military significance; (4) evaluation of segment performance; (5) comparison of mission effectiveness between the KA and KB modes of operation.

Mission termination for this function is defined to occur at the time of delivery of the flight items (e.g., data, Flight Crew and Gemini B or DRV's) to predetermined locations for initiation of post-flight analysis and/or positive equipment disposal if recovery is not feasible.

3.1.1.2 Special Considerations

Real-time or near real-time on-orbit evaluations of immediate changes to mission operations are not included in this function. (Such evaluation requirements will be developed as a part of Function 12.0 "Perform Mission Control".) However, requirements for pre-termination evaluation reports, necessary for overall management cognizance of the mission and possible longer term redirection of the flight program, shall be developed as a part of this Function.

3.1.1.3 Data Requirements

The STD for this function will be used by the government agencies and shall be used by the associate contractors as a baseline reference description for system evaluation. Detailed discussions for coordination of operational plans and technical interchanges for design definition of equipment required, shall be based on the STD to the extent practicable.

Planning and requirements documents which must be based on and/or be consistent with the Function 1.0 STD include the following:

NOTE: The planning and requirements documents listed below are the non-DORIAN versions. This list also applies to their DORIAN counterparts, as applicable. DORIAN-only documents will be added as they are identified.

HAMILTON STANDARD ITEMS:

- ECP's for System Requirement Change A016 (C-12)
- ECP's for CEI's A017 (C-13)
- ECP's After FACI A018 (C-19)
- Spec. Maintenance Document A019 (C-11)
- System/Design T S Report A041 (S-54)
- Cont. Seg. Post Flight Test Report A054 ([U] T-604)

MARTIN ITEMS:

- Spec. Maint. Documents C2 & C19 (C-11/M)
- ECP's for System Requirement Change C3 & C4 (C-12)
- ECP's for CEI's Pt. I C5 (C-13/M)
- ECP's for CEI's Pt. II C6 (C-19M)
- Specification Maintenance Document C19 (C-11/M)
- Launch Evaluation Report T6, T7 & T8 (T-126/M)
- Quick Look Ascent & Orbit Report
- Quick Look Post-Operations Report

GENERAL ELECTRIC ITEMS:

- SCN B044 (C-11)
- ECP's for CEI's B046 (C-13)
- ECP's for System Requirement Change B047 (C-12)
- ECP's after FACI B048 (C-19)
- System/Design T S Reports B079 (S-54)
- CEI Evaluation/Qualification Test Plan B090-B094 [(U)T-405]
- Flight Operations Support Study Report B 111 [(U)T-4102]
- Quick Look Ascent & Orbit Report
- Quick Look Post-Operations Report
- Contractor Post-Flight Segment

MCDONNELL ITEMS:

- Manned Recovery Requirement Document 18T, (U), T-(221-207)
- Program Requirement Document - 19T (U) T-(116)
- Operations Support Evaluation Plan - 205, (U), S-211
- Post Flight Evaluation Plan - 285, (U) (S-222)

MCDONNELL ITEMS: (Continued)

- Orbital Requirement Document - 17T, (U) (T-221 [T3]) (Manned)
- ECP's for CEI's - 16C (C-13)
- ECP's General (After FACI) - 18C (C-19)
- ECP's for System Requirement - 27C (C-12)
- S/C Instru. System Report - 135 (U) (S-(205)
- Instru. Books A & B - 145 & 155 (U) (S-(206), (207)
- Specification Maintenance Document - 15C, (U) (C-11)
- Data Acquisition & Handling Plan
- Quick Look Ascent & Orbit Report
- Quick Look Post Operations Report
- Launch Evaluation Report, (Inputs)
- Contractor Post-Flight Segment Report
- Post-Flight Test Procedure

DOUGLAS ITEMS:

- Spec. Maintenance Document (CEI's B136 & 137 (C-11)
- ECP's for System Requirement Chg. B138 (C-12)
- ECP's for CEI's B139 & 140 (C-13)
- ECP's - Post FACI B141 (C-19)
- Interface Document Evaluation B195 (UE-101)
- System/Design Trade Study Reports B247 (S-54)
- ORD Inputs B281 (UT-141)
- Flight Test Engineering Analysis Report B306 (UT-117)
- Post Flight Analysis & Evaluation Study B349 (UT-142)
- Quick Look Ascent & Orbit Report
- Quick Look Post-Operations Report
- Contractor Post-Flight Segment
- Final Flight Test Engineering Report

AGENCY ITEMS:

- Orbital Support Plan (OSP)

The STD for Function 1.0 shall define requirements to a level of detail sufficient to provide a requirements source for preparation of the documents listed above and others that may evolve.

Specific references to contractual requirements documents by paragraph number shall be shown in the appropriate RAS column.

STD shall be prepared using the procedures and formats of Part I of this Exhibit, as follows:

a. FFBD's per paragraph 3.2.1.
b. RAS's per paragraph 3.2.2; however, Right Hand RAS's and the Left Hand RAS paragraph regarding "effectiveness" are not required for Function 1.0 since they are not applicable.
c. TLS's per paragraph 3.2.3.
d. SBD's per paragraph 3.2.4 (Ref. Part II, Section 3.2).
e. TSR's per paragraph 3.2.5.

Interface coding, furnished in Appendix A of Part II, shall be incorporated in the RAS per paragraph 3.2.2 of Part I of this Exhibit.

3.1.1.4 Task Assignment

The Function 1.0 integration responsibility is assigned to Douglas MSSD. Contributing associate contractors are General Electric, McDonnell Astronautics, Martin-Marietta, and Hamilton Standard. Martin-Marietta Corporation shall integrate data from United Technology Center, Aerojet General Corporation, A-C Electronics Division and Spacecraft Incorporated and shall submit the integrated T-IIIM STD to the Function 1.0 Integrator. The MOL Program Office will furnish agency information.

General Electric shall prepare the FFBD's to include both the General Electric and Eastman Kodak functions. Eastman Kodak shall verify the FFBD's for their functions and coordinate changes desired with General Electric. Eastman Kodak shall prepare RAS's, TLS's, SBD's, and TSR's to support the FFBD's and submit them to General Electric.

Eastman Kodak STD shall be integrated with General Electric STD by General Electric. General Electric shall perform the tasks noted in paragraph (a) below to integrate the Eastman Kodak and General Electric STD.

General Electric shall perform the tasks noted in paragraph (b) below for both the General Electric STD and for integrated General Electric/Eastman Kodak STD.

Eastman Kodak shall perform the tasks noted in paragraph (b) below in preparing and submitting STD to General Electric except for preparation of FFBD's.

a. The Function 1.0 Integrator shall:

1. Prepare, coordinate and issue schedules for contractor/government agency participation in accordance with the master schedule issued by the OSI.

2. Establish contractor assignments for review, comment, and expansion of flow diagrams and RAS's.

3. Identify the required timelines and make assignments for preparation.

4. Review contributed data and comments received from participants to identify incompatibilities in requirements, plans, or definitions reflected in the STD for Function 1.0. The Function Integrator shall inform the affected organizations of identified problems, request revised inputs and, if necessary, call a meeting of those involved to achieve a resolution.

5. Determine and insert interface coding in appropriate columns on RAS's per paragraph 3.1.1.3 above.

6. Prepare STD for distribution in accordance with paragraph 3.3 of Part II of this Exhibit.

7. As soon as possible after the function integration of each STD expansion has been completed, the Function Integrator shall release copies to participating contractors concurrent with submittal for system level integration to the MPI Contractor and to OSI.

8. Respond to requests for clarification or revision of Function 1.0 STD if discrepancies are identified during system level integration. Coordinate as required.

b. Contributing Associate Contractor Tasks:

1. Prepare flow diagrams, RAS's, timelines, and SBD's in format specified in Part I of this Exhibit and submit on 11x17 inch vellums to the Function Integrator and the OSI. Flow diagram expansion and their attendant RAS and Timeline Sheet shall be submitted as a package for integration.

2. Respond to requests for clarification or revision of the contributed data if discrepancies are identified during integration.

3. Each of the associate contractors involved in the post-flight analysis shall utilize the requirements established in the STD for this function in their respective data reduction and post-flight analysis plans.

4. Each of the associates will determine the ground rules and the criteria for evaluation and the evaluation effort for his segment as a part of his participation in the analysis of requirements for the assigned functions derived from the overall system function breakdown described in Section 3.1 of Part I of this Exhibit. These will include: the types and quantities of data items to be recorded, transmitted by telemetry, retrieved, measured prior to launch or after recovery; priority and evaluation criteria; and the equipment, personnel, and facility requirements for processing and reducing the data. Tradeoff studies shall be made as necessary to ascertain the data requirements.

c. MOL Program Integration Contractor (Douglas) as System Level Integrator of the STD shall:

1. Review Function 1.0 STD to identify possible inconsistencies or incompatibilities in functional descriptions and timing, defined interfaces and stated requirements, using as a guide the functional cross-references incorporated in the STD. Compare the interfaces identified in the functional schematics with the interface requirements defined in the RAS's to verify adequacy of interface definition.

2. Inform the appropriate Function Integrator of discrepancies, coordinate corrective action, and request OSI resolution, if required.

3. When the submitted STD is considered consistent across all related functions, the MPI Contractor shall recommend OSI approval.

d., The OSI shall:

1. Resolve inter-contractor/agency issues as necessary to properly guide the analysis and definition of system evaluation requirements.

2. Approve and validate Function Integrator STD for use as system level integrated data.

3.1.2 Function 2.0, "Perform Retrieval Operations"

3.1.2.1 Function Description

These functions start with the selection and disposition of the recovery forces. Necessary reassignments are made through Mission Control.

With respect to the Flight Crew and the Reentry Module, these functions start at physical contact by the retrieval forces with the Flight Crew or the Reentry Module. With respect to the Data Reentry Vehicles (DRV's), these functions start with deployment of the recovery means prior to ejection of the first DRV from the Support Module.

These functions include normal retrieval from planned recovery areas or from contingency recovery areas (and, as a branch of this function, emergency retrieval operations). For the KA Mode, the function terminates upon delivery of the flight items (viz., data, Flight Crew, and spacecraft) to predetermined locations for initiation of post-flight analysis; or positive equipment disposal if recovery is not feasible. For the KB Mode, the function terminates upon delivery of the data from the last DRV to predetermined locations for analysis and evaluation. For both the KA and KB modes, verification of disposal of the remaining vehicle elements in orbit shall be included as a part of this function.

3.1.2.2 Special Considerations

Definition of the specific requirements for retrieval equipment, personnel operations and capabilities, and for recovery force composition and the analysis of time requirements, shall be correlated with the analysis and documentation of Mission Control activities in support of retrieval (Ref. Function 12.0) and with the AVE/AAE/crew requirements and constraints developed under Functions 3.0, 4.0, and 13.0.

3.1.2.3 Data Requirements

The STD for this function will be used by the government agencies and shall be used by the associate contractors as a baseline reference description of retrieval operations. Detail discussions for coordination of operational plans and technical interchanges for design definition of equipment required shall be based on this STD to the extent practicable.

Planning and requirements documents which must be based on and/or be consistent with the Function 2.0 STD include the following:

NOTE: The planning and requirements documents listed below are the non-DORIAN versions. This list also applies to their DORIAN counterparts, as applicable. DORIAN-only documents will be added as they are identified.

HAMILTON STANDARD ITEMS:

- ECP's for System Requirement Change A016 (C-12)
- ECP's for CEI's A017 (C-13)
- ECP's After FACI A018 (C-19)
- Specification Maintenance Document A019 (C-11)
- Flight Crew Handbook (LV/Gemini B) A028 [(U) H-602]
- Flight Directors Handbook A029 [(U) H-604]
- Tech. Pubs. - Recovery Handbook A030 [(U) H-605]
- MRRD A032 [(U) L-601]
- Flight Operations Crew Pers. Training Plan A038 [(U) Q-601]
- Flight Crew Safety Plan A040 [(U) S-600]
- System/Design T S Report A041 (S-54)
- PSA Task Analysis A045 [(U) S-605]
- PRD Inputs A053 [(U) T-603]

MARTIN ITEMS:

- PRD Input - Chg. T9 (T-21/M)

GENERAL ELECTRIC ITEMS:

- SCN B044 (C-11)
- ECP's for CEI's B046 (C-13)
- ECP's for System Requirement Chg. B047 (C-12)
- ECP's After FACI B048 (C-19)
- Failure Mode & Effects Analysis B068 [(U) R-408]
- Relib. Demonstration Study B070 [(U) R-410]
- Hazard Analysis B075 [(U) S-404]
- System/Design T S Reports B079 (S-54)
- Flight Operations Support Study Report B111 [(U) T-410]

MCDONNELL ITEMS:

- Manned Recovery Requirement Document - 18T, (U), (T-(221 - 207)
- Program Requirement Document - 19T, (U) (T- (116)
- GB Flight Effectiveness Model Report - 7R, (U) (R-(207)
- ECP's for CEI's - 16C (C-13)

MCDONNELL ITEMS: (Continued)

- Manned Flight Vehicle Time Line - 265, (U) (S-221)
- ECP's General (After FACI) 18C (C-19)
- Failure Mode & Effect. Anal. - 5R, (U) (R-(205)
- ECP's for Sys. Requirement - 27C (C-12)
- S/C Instru. Sys. Rpt. - 135, (U) (S-(205)
- Single Point Failure Analysis - 4R [(U) R-(204)
- Load Anal. - Elect. Eqpt. - 125, [(U) - S-(204)
- Instru. Books A & B - 145 & 155 (U) (S-(206, (207)
- Effectiveness Prog. Status Report - 1R (U) (R-(201)
- Specification Maint. Doc. - 15C, (U) (C-11)
- Interface Specifications - 28C (U) (C-209)
- Interface Maint. Document - 22C [(U) C-(205)]
- Update Comm. System Technical Baseline
- Task Analysis Data (Crew Training) (U) S-(219)
- Flight Dir, HB
- Flight Crew HB (GB)
- Flight Data File
- Recovery HB - Manned
- System Test Objectives (STO)
- Quick Look Post Operations Report
- Elect. System Schematics (ESS)
- Structural Design Loads 11S [(U) S-(203)]
- Flight Operations Crew Pers. Training Plan
- Flight Crew Safety Plan
- Flight Term. System (FTS) Report
- Radio Freq. Allocation (RFA) Request
- GBQ Recovery Requirements Document

DOUGLAS ITEMS:

- Spec. Maint. Document (CEI's) B136 & 137 (C-11)
- ECP's for Sys. Req. Chg. B138 (C-12)
- ECP's for CEI's B139 & B140 (C-13)
- ECP's - Post FACI B141 (C-19)
- Interface Specs. (IFS) B142 (UC-101)
- Interface Cont. Dwg. (ICD) B143 (UC-102)

DOUGLAS ITEMS: (Continued)

- IFS/ICD Maint. Doc. B144 (UC-103)
- Interface Doc. Evaluation B195 (UE-101)
- System/Design Trade Study Reports B247 (S-54)
- Mission Status Summary B277 (US-121)
- PRD Inputs B305 (UT-116)
- Quick Look Post-Operations Report

AGENCY ITEMS:

- Program Support Plan (PSP)
- Recovery Support Plan (RSP)
- Manned Recovery Support Plan (MRSP)
- Operations Requirement (OR) Pt. I, Pt. II
- System Test Objectives
- Operations Directive
- Flight Termination System IFRS Report
- Recovery Safety Plan

The STD for Function 2.0 shall define requirements to a level of detail sufficient to provide a requirements source for preparation of the documents listed above and others that may evolve. When functions are expanded to amplify the definition of operational sequences and interfaces beyond this level of detail, the Left-Hand RAS shall be limited to the function description and interface requirement. Emphasis shall be placed on the definition of operational interfaces between the Recovery Forces, Mission Control, and the items to be retrieved. Specific references to contractual requirements documents by paragraph number shall be shown in the appropriate RAS column.

STD shall be prepared using the procedures and formats of Part I of this Exhibit as follows:

a. FFBD's per paragraph 3.2.1.
b. RAS's per paragraph 3.2.2, however, SPO approved equivalent contractor prepared forms and approaches may be used in lieu of Right Hand RAS's specified in paragraph 3.2.2 of Part I. (Note: LH RAS's for procedural functions may be limited to a function description and interface requirements, as appropriate.)
c. TLS's per paragraph 3.2.3.
d. SBD's per paragraph 3.2.4 (Reference Part II, Section 3.2).
e. TSR's per paragraph 3.2.5 or comparable contractor Design Note or Technical Note format.

Interface coding, furnished in Appendix A of Part II, shall be incorporated in the RAS per paragraph 3.2.2 of Part I of this Exhibit.

3.1.2.4 Task Assignments

The Function Integration for Function 2.0 shall be performed by the McDonnell Astronautics Company. Contributing associate contractors are Douglas MSSD, General Electric, and Hamilton Standard. The MOL Program will furnish government agency information.

The Function Integration responsibility assigned to McDonnell Astronautics Company above shall be for non-DORIAN KA and KB mode requirements only. For this case, Eastman Kodak generated STD shall be integrated with General Electric STD by General Electric. The resulting integrated STD

shall be suitably altered by General Electric to remove its DORIAN classification while still retaining interfacing requirements before submission to McDonnell Astronautics.

MCASTRO shall prepare flow diagrams and RAS's for Function 2.0, including specific requirements related to the Gemini B, crew, and DRC retrieval.

The Function Integration responsibility for the DORIAN KA and KB mode portions of Function 2.0 is assigned to Douglas MSSD. Contributing associate contractors are General Electric and Eastman Kodak. As Function Integrator, Douglas shall perform the tasks noted in paragraph (a) below for the Function 2.0 DORIAN requirements.

For both the KA and KB mode, the following shall apply:

General Electric shall prepare the FFBD's to include both the General Electric and Eastman Kodak functions. Eastman Kodak shall verify the FFBD's for their functions and coordinate changes desired with General Electric. Eastman Kodak shall prepare RAS's, TLS's, SBD's, and TSR's to support the FFBD's and submit them to General Electric.

Eastman Kodak STD shall be integrated with General Electric STD by General Electric. General Electric shall perform the tasks noted in paragraph "a" below to integrate the Eastman Kodak and General Electric STD.

General Electric shall perform the tasks noted in paragraph "b" below for both General Electric STD and for integrated General Electric/Eastman Kodak STD.

Eastman Kodak shall perform the tasks noted in paragraphs b.1 and b.2 below in preparing and submitting STD to General Electric except for preparation of FFBD's.

a. The Function 2.0 Integrator shall:

   1. Prepare, coordinate, and issue schedules for contractor/government agency participation in accordance with the master schedule issued by the OSI.

2. Establish contractor assignments for review, comment and expansion of flow diagrams and RAS's. This shall include coordination of contractor definitions of any Laboratory Vehicle retrieval requirements.

3. Identify the required timelines and make assignments for preparation

4. Review contributed data and comments received from participants to identify incompatibilities in requirements, plans or definitions reflected in the STD for Function 2.0. The Function Integrator shall inform the affected organizations of identified problems, request revised inputs and, if necessary, call a meeting of those involved to achieve a resolution.

5. Determine and insert interface coding in appropriate columns on RAS's per paragraph 3.1.2.3 above.

6. Prepare STD for distribution in accordance with paragraph 3.3 of Part II of this Exhibit.

7. As soon as possible after function integration of each STD expansion has been completed, the Function Integrator shall release copies to participating contractors concurrent with furnishing it for system level integration to the MPI Contractor and the OSI.

8. Clarify or revise Function 2.0 STD if discrepancies are identified during system level integration. Coordinate as required.

b. Contributing Associate Contractor Tasks:

1. Prepare flow diagrams, RAS's, timelines, SBD's and TSR's in format specified in Part I of this Exhibit and submit on 11 X 17 inch vellum to the Function Integrator and the OSI. Flow diagram expansion and their attendant RAS and Timeline Sheet shall be submitted as a package for integration.

2. Respond to requests for clarification or revision of the contributed data if discrepancies are identified during integration.

3. Douglas, General Electric, and Hamilton Standard shall respond to specific requests from the Function Integrator for inputs related to DRV or Laboratory Vehicle retrieval/ disposal or Pressure Suit Assembly (PSA) in support of planned integration, realignment or expansion of Function 2.0 STD.

4. Douglas and General Electric shall respond to specific requests from the Function Integrator for inputs relating to the DRV's or to other DORIAN aspects for both the KA and KB modes.

c. MOL Program Integration Contractor as System Level Integrator of the STD.

1. Review Function 2.0 STD against other STD to identify possible inconsistencies or incompatibilities in functional descriptions and timing, defined interfaces and stated requirements, using as a guide the functional cross-references incorporated in the STD. Compare the retrieval operation related segment interfaces identified in the functional schematics with the interface requirements defined in the RAS's to verify adequacy of interface definition.

2. Inform the MOL Program Office of the results of the above activities.

3.1.3 Function 3.0 "Perform Deorbit Operations"

3.1.3.1 Function Description

This portion of the analysis shall identify requirements for the return to earth of the Gemini B, crew, and data, and shall also include requirements relating to disposal of the remaining vehicle elements in orbit.

In the principal flight modes, these functions start with the opening of the Gemini B/Laboratory Vehicle tunnel hatch (inclusive) or the LV-EVA hatch in the case of extravehicular transfer for final transfer of the crew to the Gemini B, and terminate with physical contact by retrieval forces with the Reentry Module or Flight Crew. For such flight modes, a branch of these functions involves Laboratory Vehicle disposal. Normal, contingency, and emergency modes of operation are to be considered in these functions.

For alternative flight modes, these functions start with the initiation of Orbiting Vehicle disposal and terminate upon completion of the disposal mode.

3.1.3.2 Special Considerations

When contingency and emergency considerations lead to an abort situation, the analysis accomplished as a part of this function shall be performed only through determination of abort indication requirements (subsequent abort requirements shall be developed as a part of Function 13.0 for these cases).

Definition of specific requirements for deorbit equipment, personnel operations and capabilities, as well as the analysis of time requirements, shall be correlated with the analysis and documentation of Mission Control activities in support of deorbit (Reference Function 12.0) and with the AVE/AAE/crew requirements and constraints developed under Function 2.0, 4.0, 5.0, and 13.0.

Requirements relating to deorbit of Data Return Vehicles for the Automatic Mode shall be defined in Function 4.0 and correlated with this function.

Retrieval and/or verification of positive disposal requirements of deorbited mission revealing equipment or data will be included in Function 2.0 for normal operations or in Function 13.0 for abort operations.

3.1.3.3 Data Requirements

The STD for this function will be used by the government agencies and shall be used by the associate contractors as a baseline reference description of Gemini B and LV deorbit operations. Detailed discussions for coordination of operational plans and technical interchanges for design definition of equipment required, shall be based on this STD to the extent practicable.

Planning and requirements documents which must be based on and/or be consistent with the Function 3.0 STD include the following:

NOTE: The planning and requirements documents listed below are the non-DORIAN versions. This list also applies to their DORIAN counterparts, as applicable. DORIAN-only documents will be added as they are identified.

Hamilton Standard Items;

- ECP's for Sys. Req. Chgs. A016 (C-12)
- ECP's for CEI Specs. A017 (C-13)
- ECP's after FACI A018 (C-19)
- Spec. Maint. Doc. A019 (C-11)
- Flt. Crew Handbook (LV/Gemini B) A028 [(U) H-602]
- Flight Director's Handbook A029 [(U) H-604]
- Maint. Req. Data A031 [(U) L-600]
- Flt. Crew Safety Plan A040 [(U) S-600]
- System/Design T.S. Report A041 (S-54)
- PSA Task Analysis A045 [(U) S-605]

GE Items:

- ECP's for CEI Spec. B046 (C-13)
- ECP's for Sys. Req. Chgs. B047 (C-12)
- ECP's after FACI B048 (C-19)
- Failure Mode & Effects Anal. B068 [(U) R-408]
- Reliab. Demonstration Study B070 [(U) R-410]
- Hazard Anal. B075 [(U) S-404]
- System/Design T.S. Report B079 (S-54)
- Flt. Opns. Support Study Report B111 [(U) T-410]
- Flt. Crew Safety Plan
- Quick Look Post Opns. Report.
- Flt. Director's Handbook
- Flt. Crew Handbook (LV)

McDonnell Items:

- Electr. Magnetic Compat. Anal 235 [(U) S-214]
- Manned Recov. Reqmt Doc. 18T [(U)T-221]
- Program Reqmt. Doc. 19T [(U) T-116]
- Crew Transfer Test Plan 7T [(U) T-201]
- Structural Qual. Test Plan 2T [(U) T-201]
- GB Flt. Effect. Model Rpt 7R [(U) R-207]
- Orbital Reqmt. Doc. 17T [(U) T-221]

- ECP's for CEI Specs. 16C (C-13)
- Manned Flt. Veh. Timeline 26S [(U) S-221]
- ECP's after FACI 18C (C-19)
- Failure Mode & Effect. Anal. 5R [(U) R-205]
- ECP's for Sys. Req. Chgs. 27C (C-12)
- Version Descrip. Doc., CPCEI, GBPS 31C [(U) C-214]
- S/C Instru. Sys. Rpt. 13S [(U) S-205]
- Single Point Failure Anal. 4R [(U) R-204]
- Explosive Comp. Tech. Data Sheet 18S [(U) S-209]
- Load Anal.-Elect. Eqpt. 12S [(U) S-204]
- Instru. Books A & B 14S and 15S [(U) S-206 & 207]
- Effectiveness Prog. Status Rpt. 1R [(U) R-201]
- Spec. Maint. Doc. 15C [(U) C-11]
- Interface Specs. 28C [(U) C-209]
- Interface Maint. Doc. 22C [(U) C-205]
- Aero. Data Book 21S [(U) S-212]
- Internal Crew Transfer Testing O-G
- Update Comm. System Tech. Baseline
- Task Analysis Data (Crew Training) [(U) S-219]
- Flt. Director Handbook
- Flt. Crew Handbook (LV & GB)
- Flt. Data File
- System Test Objectives
- Quick Look Post Opns Report
- Elect. System Schematic
- Struct. Design Loads 11S [(U) S-203]
- Flt. Crew Safety Plan
- Radio Freq. Alloc. Request

Douglas Items:

- Spec. Maint. Doc. B136 & B137 (C-11)
- ECP's for Sys. Req. Chgs. B138 (C-12)
- ECP's for CEI Specs. B139 & B140 (C-13)
- ECP's for Post FACI B141 (C-19)
- Interface Specs. B142 (UC-101)
- Interface Cont. Dwg B143 (UC-102)

- IFS/ICD Maint. Doc. B144 (UC-103)
- Config. List B145 (UC-104)
- Interface Doc. Eval. B195 (UE-101)
- Elect. Sys. Schematic B197 (UE-103)
- Training Req. Data (Flt. Crew) B234 (UQ-101)
- Sys/Design Trade Study Reports B247 (S-54)
- Sys. Safety Plan B259 & B260 (US-101)
- Stress, Fatigue, & Dym. Anal. Rpt B262 (US-103)
- Baseline Flt. Veh. Timeline B266 (US-108)
- Explosive Comp. Tech. Data Sheet B268 (US-111)
- Mission Status Summary B277 (US-121)
- ORD Inputs B281 (UT-141)
- Reliab. Crit. Comp. Data Summary B303 (UT-114)
- Flight Director's Handbook
- Flight Crew Handbook
- Flight Crew Handbook, Gemini B Input
- Command & Opns Handbook Input
- System Test Objectives
- Flight Crew Safety Plan
- Quick Look Post-Operations Report
- Radio Frequency Allocation Request B335 (RFPI 7-4067)

Agency Items:

- Orbital Support Plan
- Recovery Support Plan
- Operations Requirements Part I and Part II
- System Test Objectives
- Operations Directive

The STD for Function 3.0 shall define requirements to a level of detail sufficient to provide a requirements source for preparation of the documents listed above and others that may evolve. When functions are expanded to amplify the definition of operational sequences and interfaces beyond this level of detail, the Left Hand RAS shall be limited to the function description and interface requirement. Emphasis shall be placed on the definition of operational interfaces of the Gemini B to Crew, DRC's, Laboratory Vehicle, Pressure Suit Assembly, Mission Control and recovery forces. Specific references to contractual requirements documents by paragraph number shall be shown in the appropriate RAS column.

STD shall be prepared using the procedures and formats of Part I of this Exhibit, as follows:

a. FFBD's per paragraph 3.2.1.
b. RAS's per paragraph 3.2.2., however, SPO approved equivalent contractor prepared forms and approaches may be used in lieu of Right Hand RAS's specified in Paragraph 3.2.2 of Part I. (NOTE: LH RAS's for procedural functions may be limited to a function description and interface requirements, as appropriate.)
c. TLS's per paragraph 3.2.3.
d. SBD's per paragraph 3.2.4 (Reference Part II, Section 3.2).
e. TSR's per paragraph 3.2.5 or comparable contractor Design Note or Technical Note format.

Interface coding, furnished in Appendix A of Part II, shall be incorporated in the RAS per paragraph 3.2.2 of Part I of this Exhibit.

3.1.3.4 Task Assignment

The Function 3.0 integration responsibility has been assigned to McDonnell Astronautics (MCASTRO). Contributing associate contractors are Douglas MSSD, General Electric and Hamilton Standard.

The Function Integration responsibility assigned to McDonnell Astronautics Company above shall be for non-DORIAN KA and KB mode requirements only. For this case, Eastman Kodak generated STD shall be integrated with General Electric STD by General Electric. The resulting integrated STD shall be suitably altered by General Electric to remove its DORIAN classification while still retaining interfacing requirements before submission to McDonnell Astronautics.

The Function Integration responsibility for the DORIAN KA and KB mode portions of Function 3.0 is assigned to Douglas MSSD. Contributing Associate Contractors are General Electric and Eastman Kodak. As Function Integrator, Douglas shall perform the tasks noted in paragraph (a) below for the Function 3.0 DORIAN requirements.

For both the KA and KB mode the following shall apply:

General Electric shall prepare the FFBD's to include both the General Electric and Eastman Kodak functions. Eastman Kodak shall verify the FFBD's for their functions and coordinate changes desired with General Electric. Eastman Kodak shall prepare RAS's, TLS's, SBD's and TSR's to support the FFBD's and submit them to General Electric.

Eastman Kodak STD shall be integrated with General Electric STD by General Electric. General Electric shall perform the tasks noted in paragraph (a) below to integrate the Eastman Kodak and General Electric STD.

General Electric shall perform the tasks noted in paragraph (b) below for both General Electric STD and for integrated General Electric/Eastman Kodak STD.

Eastman Kodak shall perform the tasks noted in paragraph (b) below in preparing and submitting STD to General Electric except for preparation of FFBD's.

a. The Function 3.0 Integrator shall:

1. Prepare, coordinate and issue schedules for contractor/government agency participation in accordance with the master schedule issued by the OSI.

2. Establish contractor assignments for review, comment, and expansion of flow diagrams and RAS's. This shall include coordination of contractor definitions of impact of Gemini B separation and deorbit on subsequent deorbit of the Laboratory Vehicle.

3. Identify the required timelines and make assignments for preparation.

4. Review contributed data and comments received from participants to identify incompatibilities in requirements, plans, or definitions reflected in the STD for Function 3.0. The Function Integrator shall inform the affected organizations of identified problems, request revised inputs and, if necessary, call a meeting of these involved to achieve a resolution.

5. Determine and insert interface coding in appropriate columns on RAS's per paragraph 3.1.3.3 above.

6. Prepare STD for distribution in accordance with paragraph 3.3 of Part II of this Exhibit.

7. As soon as possible after the function integration of each STD expansion has been completed, the Function Integrator shall release copies to participating contractors/agencies concurrent with submittal for system level integration to the MPI Contractor and OSI.

8. Respond to requests for clarification or revision of Function 3.0 STD if discrepancies are identified during system level integration. Coordinate as required.

b. Contributing Associate Contractor Tasks:

1. Prepare flow diagrams, RAS's and timelines in format specified in Part I of this Exhibit and submit on 11x17 inch vellum to the Function Integrator and to the OSI. Flow diagram expansion and their attendant RAS and Timeline Sheet shall be submitted as a package for integration.

2. Respond to requests for clarification or revision of the contributed data if discrepancies are identified during integration.

c. MOL Program Integration Contractor as System Level Integrator of the STD shall:

1. Review Function 3.0 STD against other STD to identify possible inconsistencies or incompatibilities in functional descriptions and timing, defined interfaces and stated requirements, using as a guide the functional cross-references incorporated in the STD. Compare the deorbit interfaces identified in the functional

schematics with the interface requirements defined in the RAS's to verify adequacy of interface definition.

2. Inform the appropriate Function Integrator of discrepancies, coordinate corrective action, and request OSI resolution, if required.

3. When the submitted STD is considered consistent across all related functions, the MPI Contractor shall recommend OSI approval.

d. The OSI shall:

1. Resolve inter-contractor/agency issues as necessary to properly guide the analysis and definition of deorbit requirements.

2. Approve and validate Function Integrator STD for use as system level integrated data.

3.1.4 Function 4.0, "Perform On-Orbit Objectives"

3.1.4.1 Function Description

For the principal flight modes, these functions begin at the closing of the Gemini B/Laboratory Vehicle tunnel hatch (exclusive) or the LV-EVA hatch in the case of extravehicular transfer by the second crewman following initial transfer from the Gemini B, and terminate at the opening of this hatch (exclusive) for final transfer of the crew to Gemini B. For alternative flight modes, these functions start when the Orbiting Vehicle achieves the operational orbit and terminate with the initiation of Orbiting Vehicle disposal. This function includes ejection and de-orbit of the Data Reentry Vehicles (DRV).

3.1.4.2 Special Considerations

Normal, contingency and emergency modes of operation are included in this function. Redundant, alternate and degraded modes of operation shall be included in the analysis of the requirements for the on-orbit functions. Contingency and emergency modes leading to an abort decision shall be analyzed as part of this function. Subsequent flight crew abort requirements shall be developed as part of Function 13.0.

3.1.4.3 Data Requirements

The STD for this function will be used by the government agencies and shall be used by the associate contractors as a baseline reference description of on-orbit operations. Detailed discussions for coordination of operational plans and technical interchange for design definition of equipment required shall be based on this STD to the extent practicable.

Planning and requirements documents which must be based on and/or be consistent with the Function 4.0 STD include the following:

NOTE: The planning and requirements documents listed below are the non-DORIAN versions. This list also applies to their DORIAN counterparts, as applicable. DORIAN-only documents will be added as they are identified.

HAMILTON STANDARD ITEMS.

- ECP's for System Requirements Change A016 (C-12)
- ECP's for CEI's A017 (C-13)
- ECP's after FACI A018 (C-19)
- Specification Maintenance Document A019 (C-11)
- Flight Crew Handbook (LV/Gem.B) A028 [(U) H-602]
- Flight Directors Handbook A029 [(U) H-604]
- Maintenance Requirements Data A031 [(U) L-600]
- Flight Crew Safety Plan A040 [(U) S-600]
- System/Design TS Report A041 (S-54)
- PSA Task Analysis A045 [(U) S-605]
- System Test Objectives A046 [(U) T-600]

GENERAL ELECTRIC ITEMS:

- Version Desc. Document B035 [(U) C-404]
- Positional Handbook B037 [(U) H-401]
- SCN B044 (C-11)
- ECP's for CEI's B046 (C-13)
- ECP's for System Requirements Change B047 (C-12)
- ECP's After FACI B048 (C-19)
- Reliability/Maintenance Measure. Plan B061 [(U) R-402]
- Reliability Maintenance Apportion. Report B063 [(U) R-403]
- Mission Crit. Comp. Plan Report B064 [(U) R-404]
- Reliability FOM Analysis B065 [(U) R-405]
- Availability Analysis B067 [(U) R-407]
- Failure Mode and Effects Analysis B068 [(U) R-408]
- Reliability Demonstration Study B070 [(U) R-410]
- Hazard Analysis B075 [(U) S-404]
- Power Status Report B076 [(U) S-405]
- System/Design TS Reports B079 (S-54)
- Rehearsal Plan (Input) B104 [(U) T-407]
- Flight Operations Support Study Report B111 [(U) T-410]
- Dynamic Analysis Report B114 [(U) S-406]
- OV Structure Integrity Analysis Report B119 [(U) S-407]
- LV Heat Trans. Analysis Report Input B121 [(U) S-408]
- Electrical System Schematic B122 [(U) E-402]
- RRD Input

GENERAL ELECTRIC ITEMS: (Continued)

- System Test Objectives
- Flight Crew Safety Plan
- Quick Look Ascent and Orbit Report
- Quick Look Post-Operations Report
- Flight Directors Handbook
- Flight Crew Handbook Laboratory Vehicle
- Command and Operations Handbook

MCDONNELL ITEMS:

- Electromagnetic Compatibility Analysis 23S [(U) S-(214)]
- Gemini B Effectiveness Model Report 7R (U)R-(207)
- Orbital Requirement Document 17T U (T-221 T3) (Manned)
- ECP's for CEI's 16C (C-13)
- Manned Flight Vehicle Time Line 26S U (S-221)
- ECP's General (After FACI) 18C (C-19)
- Failure Mode and Effectiveness Analysis 5R [(U) R-(205)]
- ECP's for System Requirements 27C (C-12)
- S/C Instru. Sys. Report 13S [(U) S-(205)]
- Single Point Failure Analysis 4R [(U) R-(204)]
- Load Analysis - Electrical Equipment 12S [(U) S-(204)]
- Instru. Books A and B 14S and 15S (U) (S-(206), (207)
- Effectiveness Progress Status Report 1R (U) (R-(201)
- Specification Maintenance Document 15C (U)(C-11)
- Interface Specifications 28C (U) (C-209)
- Interface Maintenance Document 22C [(U) C-(205)]
- Update Comm. System Technical Baseline
- Task Analysis Data (Crew Training) (U) S-(219)
- Flight Directors Handbook
- Flight Crew Handbook (Laboratory Vehicle)
- Flight Data File
- System Test Objectives (STO)
- Quick Look Ascent and Orbit Report
- Quick Look Post Operations Report
- Electrical System Schematics (ESS)
- Structural Design Loads 11S [(U) S-(203)]
- Flight Crew Safety Plan
- Radio Frequency Allocation (RFA) Request

DOUGLAS ITEMS:

- Specification Maintenance Document (CEI's) B136 & B137 (C-11)
- ECP's for System Requirements Change B138 (C-12)
- ECP's for CEI's B139 & B140 (C-13)
- ECP's - Post FACI B141 (C-19)
- Interface Specifications (IFS) B142 (UC-101)
- Interface Control Drawing (ICD) B143 (UC-102)
- IFS/ICD Maintenance Document B144 (UC-103)
- As-Built Configuration List (AVE - CEI's) B145 (UC-104)
- CEI Computer Program Part II B152-156 (UC-106)
- Version Description Document (Computer Program) B160-B164 (UC-112)
- Interface Document Evaluation B195 (UE-101)
- Electrical System Schematic B197 (UE-103)
- Positional Handbook - Computer Program B203 & B204 (UH-101)
- Users Manual (Computer Program) B205-B209 (UH-102)
- Training Requirements Data (Flight Crew) B234 (UQ-101)
- System/Design Trade Study Report B247 (S-54)
- System Safety Plan (SSP) B259 & B260 (US-101)
- LV Structure Integrity Analysis Report B261 (US-102)
- Stress, Fatigue, & Dynamics Analysis Report B262 (US-103)
- Baseline Flight Vehicle Timeline B266 (US-108)
- Explosive Comp. Tech, Data Sheet B268 (US-111)
- Mission Status Summary B277 (US-121)
- ORD Inputs B281 (UT-141)
- Reliability Crit. Comp. Data Summary B303 (UT-114)
- Item Test Procedures (Computer Program) B308-B312 (UT-119)
- Flight Directors Handbook Input
- Flight Crew Handbook Laboratory Vehicle
- Flight Crew Handbook Gemini B Input
- Command and Operations Handbook Input
- System Test Objectives
- Flight Crew Safety Plan
- Quick Look Ascent and Orbit Report
- Quick Look Post-Operations Report
- Radio Frequency Allocation (RFA) Request B335 (AFFI 7-4067)

AGENCY ITEMS:

- Orbital Support Plan (OSP)
- Recovery Support Plan (RSP)
- Operations Requirements (OR) Pt. I, Pt. II
- System Test Objectives
- Operations Directive

The STD for Function 4.0 shall define requirements to a level of detail sufficient to provide a requirements source for preparation of the documents listed above and others that may evolve. Specific references to contractual requirements documents by paragraph number are required in the appropriate RAS column.

The STD shall be prepared using the procedures and formats of Part I of this Exhibit, as follows:

a. FFBD's per paragraph 3.2.1.
b. RAS's per paragraph 3.2.2; however, MOL SPO approved equivalent contractor prepared forms and approaches may be used in lieu of Right Hand RAS's specified in paragraph 3.2.2 of Part I.
c. TLS's per paragraph 3.2.3.
d. SBD's per paragraph 3.2.4 (Reference Part II, Section 3.2).
e. TSR's per paragraph 3.2.5.

Interface coding, furnished in Appendix A of Part II, shall be incorporated in the RAS per paragraph 3.2.2 of Part I of this Exhibit.

3.1.4.4 Task Assignment

The Function Integrator for Function 4.0 is Douglas MSSD. Contributing associate contractors are McDonnell Astronautics, Hamilton Standard and General Electric.

General Electric shall prepare the FFBD's to include both the General Electric and Eastman Kodak functions. Eastman Kodak shall verify the FFBD's for their functions and coordinate changes desired with General Electric. Eastman Kodak shall prepare RAS's, TLS's, SBD's, and TSR's to support the FFBD's and submit them to General Electric.

Eastman Kodak STD shall be integrated with General Electric STD by General Electric. General Electric shall perform the tasks noted in paragraph "a" below to integrate the Eastman Kodak and General Electric STD.

General Electric shall perform the tasks noted in paragraph "b" below for both General Electric STD and for integrated General Electric/Eastman Kodak STD.

Eastman Kodak shall perform the tasks noted in paragraph "b" below in preparing and submitting STD to General Electric except for preparation of FFBD's.

a. The Function 4.0 Integrator shall:

1. Prepare, coordinate and issue schedules for contractor/government agency participation in accordance with the master schedule issued by the OSI.

2. Establish contractor assignments for review, comment, and expansion of flow diagrams and RAS's.

3. Identify the required timelines and make assignments for preparation.

4. Review contributed data and comments received from participants to identify incompatibilities in requirements, plans, or definitions reflected in the STD for Function 4.0. The Function Integrator shall inform the affected organizations of identified problems, request revised inputs and, if necessary, call a meeting of those involved to achieve a resolution.

5. Determine and insert interface coding in appropriate columns on RAS's per paragraph 3.1.4.3 above.

6. Prepare STD for distribution in accordance with paragraph 3.3 of Part II of this Exhibit.

7. As soon as possible after the function integration of each STD expansion has been completed, the Function Integrator shall release copies to participating contractors concurrent with submittal for system level integration to the MPI Contractor and OSI.

8. Respond to requests for clarification or revision of Function 4.0 STD if discrepancies are identified during system level integration. Coordinate as required.

b. Contributing Associate Contractor Tasks:

1. Prepare flow diagrams, RAS's, SBD's and TSR's in format specified in Part I of this Exhibit and submit on 11x17 inch vellum to the Function Integrator and to the OSI. Flow diagram expansion and its attendant RAS and Timeline Sheet shall be submitted as a package for integration.

2. Respond to requests for clarification or revision of the contributed data if discrepancies are identified during integration.

c. MOL Program Integration Contractor as System Level Integrator of the STD shall:

1. Review Function 4.0 STD to identify possible inconsistencies or incompatibilities in functional descriptions and timing, defined interfaces and stated requirements, using as a guide the functional cross-references incorporated in the STD. Compare the on-orbit interfaces identified in the functional schematics with the interface requirements defined in the RAS's to verify adequacy of interface definition.

2. Inform the appropriate Function Integrator of discrepancies, coordinate corrective action, and request OSI resolution, if required.

3. When the submitted STD is considered consistent across all related functions, the MPI Contractor shall recommend OSI approval.

d. The OSI shall:

1. Resolve inter-contractor/agency issues as necessary to properly guide the analysis and definition of on-orbit requirements.

2. Approve and validate Function Integrator STD for use as system level integrated data.

3.1.5 Function 5.0 "Perform Early Orbit Operations"

3.1.5.1 Function Description

These functions start with the blowing of the explosive nuts at the Launch Vehicle/Orbiting Vehicle interface (exclusive). Included as a part of the analysis of these functions are the maneuvering requirements to achieve the specified flight-peculiar operational orbit. These functions terminate at the closing of the Gemini B/Laboratory Vehicle tunnel hatch (inclusive) or the LV-EVA hatch in the case of extravehicular transfer by the second crewman following transfer from the Gemini B, for the principal flight modes.

For alternative flight modes, these functions terminate when the Orbiting Vehicle achieves an operational orbit.

3.1.5.2 Special Considerations

Normal, contingency and emergency modes of these functions shall be analyzed to determine the equipment and personnel requirements. Contingency and emergency functional branches leading to an abort shall be analyzed only up to the point of determining a requirement for an abort indication (subsequent abort requirements shall be developed as a part of Function 13.0 for these cases).

3.1.5.3 Data Requirements

Function 5.0 STD shall be used as a baseline definition of the early orbit phase of the mission. Function 5.0 shall be expanded sufficiently to identify the early orbit performance/design requirements for the OV, including definition of Mission Payload requirements. The STD shall involve the detail analysis of contingencies.

Planning and requirements documents which must be based on and/or be consistent with the Function 5.0 STD include the following:

NOTE: The planning and requirements documents listed below are the non-DORIAN versions. This list also applies to their DORIAN counterparts, as applicable. DORIAN-only documents will be added as they are identified.

HAMILTON STANDARD ITEMS:

- ECP's for Sys. Req. Chg. A016 (C-12)
- ECP's for CEI's A017 (C-13)
- ECP's After FACI A018 (C-19)
- Spec. Maint. Doc. A019 (C-11)
- Flight Crew Handbook (LV/Gemini B) A028 [(U) H-602]
- Flight Directors Handbook A029 [(U) H-604]
- Maint. Req. Data A031 [(U) L-600]
- Flight Crew Safety Plan A040 [(U) S-600]
- System/Design T S Report A041 (S-54)
- PSA Task Analysis A045 [(U) S - 605]

GENERAL ELECTRIC ITEMS:

- ECP's for CEI's B046 (C-13)
- ECP's for System Requirement Chg. B047 (C-12)
- ECP's After FACI B048 (C-19)
- Failure Mode & Effects Analysis B068 [(U) R - 408]
- Reliability Demonstration Study B070 [(U) R - 410]
- Hazard Analysis B075 [(U) S- 404]
- Power Status Report B076 [(U) S - 405]
- System/Design T S Reports B079 (S-54)
- Flight Operations Support Study Report B111 [(U) T - 410]
- Dynamic Analysis Report B114 [(U) S - 406]
- OV Structure Integrity Analysis Report B119 [(U) S - 407]
- LV Heat Trans. Anal. Report B121 [(U) S - 408]
- Electrical System Schematic B122 [(U) E - 402]
- System Test Objectives
- Flight Crew Safety Plan
- Quick Look Ascent & Orbit Report
- Quick Look Post-Operations Report
- Flight Directors Handbook
- Flight Crew Handbook - LV
- Electro Magnetic Compatibility Anal. - 235 [(U) S - (214)]
- Crew Transfer Test Plan - 7T [(U) T - (201)]
- GE Flight Effectiveness Model Report - 7R [(U) R - (207)]

MCDONNELL ITEMS:

- Orbital Requirement Document - 17T, [(U) T-221]
- ECP's for CEI's - 16C (C-13)
- Manned Flt. Veh. Time Line - 265, [(U) (S-221)]
- ECP's General (After FACI) - 18C (C-19)
- Failure Mode & Effect. Anal. - 5R [(U) R - (205)]
- ECP's for System Requirement - 27C (C-12)
- Version Descrip. Doc., CPCEI, GBPS - 21C [(U) C - (214)]
- S/C Instru. Sys. Rpt. - 135 [(U) S - (205)]
- Single Point Failure Anal. - 4R [(U) R - (204)]
- Load Anal. - Elect. Eqpt. - 125 [(U) S-(204)]
- Instru. Books A & B 145 & 155 [(U) S - (206, 207)]
- Effectiveness Prog. Status Report - 1R [(U) R - (201)]
- Specification Maint. Doc. - 15C, (U) (C-11)
- Interface Specifications - 28C [(U) C - (209)]
- Interface Maint. Doc. - 22C [(U) C - (205)]
- Internal Crew Transfer Testing O - G
- Update Comm. System Technical Baseline
- Task Analysis Data (Crew Training) [(U) S - (219)]
- Flight Director's Handbook
- Flight Crew HB (Lab Veh.)
- Flight Crew HB (GB)
- Flight Data File
- System Test Objectives (STO)
- Range Safety Report
- Quick Look Ascent & Orbit Report
- Quick Look Post Operations Report
- Elect. System Schematics (ESS)
- Structural Design Loads 11S [(U) S - (203)]
- Flight Crew Safety Plan
- Radio Freq. Allocation (RFA) Request

DOUGLAS ITEMS:

- Spec. Maint. Doc. (CEI's) B136 & 137 (C-11)
- ECP's for Sys. Req. Chg. B138 (C-12)

DOUGLAS ITEMS (Continued),

- ECP's for CEI's B139 & B140 (C-13)
- ECP's - Post FACI B141 (C-19)
- Interface Specs. (IFS) B142 (UC-101)
- Interface Cont. Dwg. (ICD) B143 (UC-102)
- IFS/ICD Maint. Doc. B144 (UC-103)
- As-Built Config. List (AVE - CEI's) B145 (UC-104)
- Interface Doc. Evaluation B195 (UE-101)
- Elect. System Schematic B197 (UE-103)
- Training Req/ Data (Flt. Crew) B234 (UQ-101)
- System/Design Trade Study Reports B247 (S-54)
- System Safety Plan (SSP) B259 & B260 (US-101)
- LV Structure Integrity Analysis Report B261 (US-102)
- Stress, Fatigue & Dym. Anal. Report B262 (US-103)
- Baseline Flight Vehicle Timeline B266 (US-108)
- Mission Status Summary B277 (US-121)
- ORD Inputs B281 (UT-141)
- Relia. Crit. Comp. Data Summary B303 (UT-114)
- Flt. Directors Handbook Input
- Flight Crew Handbook Lab. Veh.
- Flight Crew Handbook Gemini B Input
- Command & Operations Handbook Input
- System Test Objectives
- Flight Crew Safety Plan
- Range Safety Report
- Quick Look Ascent & Orbit Report
- Quick Look Post-Operations Report
- Radio Freq. Allocation (RFA) Request B335 (AFP) 7-4067)

AGENCY ITEMS:

- Orbital Support Plan (OSP)
- Operations Requirements (OR) Pt. I, Pt. II
- System Test Objectives
- Operations Directive

The STD for Function 5.0 shall define requirements to a level of detail sufficient to provide a requirements source for preparation of the documents listed above and others that may evolve. When functions are expanded to amplify the definition of operational sequences and interfaces beyond this level of detail, the Left Hand RAS shall be limited to the function description and interface requirements.

STD shall be prepared, using the procedures and formats of Part I of this Exhibit, as follows:

a. FFBD's per paragraph 3.2.1.
b. RAS's per paragraph 3.2.2; however, SPO approved equivalent contractor prepared forms and approaches may be used in lieu of Right Hand RAS's specified in paragraph 3.2.2 of Part I. (Note: LH RAS's for procedural functions may be limited to Function Descriptions and Interface requirements.)
c. TLS's per paragraph 3.2.3.
d. SBD's per paragraph 3.2.4 (Reference paragraph 3.2 of Part II of this Exhibit).
e. TSR's per paragraph 3.2.4, or comparable contractor's Design Note or Technical Note format.

Interface coding, furnished in Appendix A of Part II, shall be incorporated in the RAS per paragraph 3.2.2 of Part I of this Exhibit.

3.1.5.4 Task Assignments

The Function Integration responsibility for Function 5.0 is assigned to the McDonnell Astronautics Company (MCASTRO). Contributing associate contractors are Douglas MSSD, Hamilton Standard, and General Electric Company.

The Function Integration responsibility assigned to McDonnell Astronautics Company above shall be for non-DORIAN KA mode requirements only.

For the KA mode, Eastman Kodak generated STD shall be integrated with General Electric STD by General Electric. The resulting integrated STD shall be suitably altered by General Electric to remove its DORIAN classification while still retaining interfacing requirements before submission to McDonnell Astronautics.

The Function Integration responsibility for the total KB mode and DORIAN KA portions of Function 5.0 is assigned to Douglas MSSD. Contributing Associate Contractors are General Electric and Eastman Kodak. As Function Integrator, Douglas shall perform the tasks noted in paragraph (a) below for the KB mode.

For both the KA and KB mode the following shall apply:

General electric shall prepare the FFBD's to include both the General Electric and Eastman Kodak functions. Eastman Kodak shall verify the FFBD's for their functions and coordinate changes desired with General Electric. Eastman Kodak shall prepare RAS's, TLS's, SBD's and TSR's to support the FFBD's and submit them to GE.

Eastman Kodak STD shall be integrated with General Electric STD by General Electric. In accomplishing this integration General Electric shall perform the tasks noted in paragraph (a) below.

General Electric shall perform the tasks noted in paragraph (b) below for both GE STD and for integrated General Electric/Eastman Kodak STD.

Eastman Kodak shall perform the tasks noted in paragraph (b) below in preparing and submitting STD to General Electric except for preparation of FFBD's.

a. The Function Integrator for this function shall:

   1. Prepare, coordinate and issue schedules for associate contractor/government agency participation in accordance with the Master Schedule issued by OSI.

   2. Establish contractor assignments for review, comment, expansion, contingency analysis, and update of flow diagrams, timelines, and RAS's.

   3. Review contributed data and comments received from participants to ensure documentation is accurate, complete, and concise. The Function Integrator shall inform the organizations of any identified problems, request revised inputs, and call a meeting of those involved, if necessary, to achieve resolution.

4. Determine and insert interface coding in appropriate columns on RAS's per paragraph 3.1.5.3 above.

5. Prepare STD for distribution in accordance with paragraph 3.3 of Part II of this Exhibit.

6. As soon as possible after the function integration of each STD expansion has been completed, the Function Integrator shall release copies to participating contractors concurrent with submittal for system level integration to the MPI Contractor and OSI.

7. Respond to requests for clarification or revision of Function 5.0 STD if discrepancies are identified during system level integration. Coordinate as required.

b. The Contributing Associate Contractors shall:

1. Prepare flow diagrams, RAS's, and Timelines in format specified in Part I of this Exhibit and submit on 11x17 inch vellum to the Function Integrator and the OSI. Flow diagram expansion and its attendant RAS and Timeline sheet shall be submitted as a package for integration.

2. Respond to requests for clarification or revision of the contributed data if discrepancies are identified during integration.

c. MOL Program Integration Contractor as System Level Integrator of the STD shall:

1. Review Function 5.0 STD to insure it is consistent with other STD using as a guide the cross-references incorporated in the STD. Compare the early orbit interfaces identified in the schematic block diagrams with the interface requirements defined in the RAS's to verify adequacy of interface definitions.

2. Inform the appropriate Function Integrator of discrepancies, coordinate corrective action, and request OSI resolution, if required.

3. When the STD is considered consistent, the MPI Contractor shall recommend OSI approval.

d. As the Overall System Integrator (OSI), the MOL Program Office shall:

1. Resolve inter-contractor/agency discrepancies as required.

2. Validate and approve Function Integrator STD for use as system level integrated data.

3.1.6 Function 6.0, "Perform Boost"

3.1.6.1 Function Description

This function starts at liftoff and terminates with the blowing of the explosive nuts at the Launch Vehicle/Orbiting Vehicle interface with the exception that the Launch Vehicle operations covering positive booster separation and disposal are included as a part of this function. Also included as a part of the analysis of this function are the requirements to achieve the specified flight-peculiar nominal orbit. Both normal and various contingency modes are branches of these functions to be analyzed for personnel and equipment requirements.

3.1.6.2 Special Considerations

Emergency modes of operation shall be analyzed for this function. Redundant, alternate, and degraded modes of operation shall be included in the analysis of the requirements for the boost functions. Contingency and emergency modes leading to an abort decision shall be analyzed as part of this function. Subsequent flight crew abort requirements shall be developed as part of Function 13.0.

3.1.6.3 Data Requirements

The STD for this function will be used by the government agencies and shall be used by the associate contractors as a baseline reference description of the vehicle during boost operations. Detailed discussions for coordination of operational plans and technical interchanges for design definition of equipment required, shall be based on this STD to the extent practicable.

Planning and requirements documents which must be based on and/or be consistent with the Function 6.0 STD include the following:

NOTE: The planning and requirements documents listed below are the non-DORIAN versions. This list also applies to their DORIAN counterparts, as applicable. DORIAN-only documents will be added as they are identified.

HAMILTON STANDARD ITEMS:

- ECP's for Sys. Req. Chg. A016 (C-12)
- ECP's for CEI's A017 (C-13)
- ECP's After FACI A018 (C-19)
- Spec. Maint. Doc. A019 (C-11)
- Flight Crew Handbook (LV/Gemini B) A028 [(U) H-602]
- Flight Directors Handbook A029 [(U) H - 604]
- Flight Crew Safety Plan A040 [(U) S - 600]
- System/Design T S Report A041 (S-54)
- PSA Task Analysis A045 [(U) S - 605]
- PRD Inputs A053 [(U) T - 603]

MARTIN ITEMS:

- Spec. Maint. Documents C2 & C19 (C-11/M)
- ECP's for Sys. Req. Chg. C3 & C4 (C-12)
- ECP's for CEI's Pt. I C5 (C-13/M)
- ECP's for CEI's Pt. II C6 (C-19M)
- Spec. Maint. Doc. C19 (C-11/M)
- Engr. Data (Cat. B) Interface Cont. E3 (E - 106/M)
- Missile Explosive Comp. Tech. Data Sheet; H1 (H-4)
- Design Loads Report S1 (US-111/M)
- System Dynamics Anal. S4
- Tech. Info. Veh. Elec. Req. Study S7 (XS - 621/M)
- Tech. Info. - EMC Study S8 (XS - 621/M)
- Titan IIIM Data Book S9
- Tech. Info. - Stability Anal. S10 (XS - 621/M)
- Prop. Sys. Anal. Report S14 (US-114)
- Prop. Temp. Anal. (Launch) S15 (US-110)
- Struct. Dynamics Report S17 (US-112)
- Launch Flyout Envel. Study S33 (XS - 621/M)
- Staging Analysis S34
- Tech. Info. - Ref. Traj. Anal. S35 (XS - 621/M)
- Tech. Info. - Ref. Traj. Anal. S36 (XS - 621/M)
- Launch Flyout Envel. Study S37 (XS - 621/M)

MARTIN ITEMS: (Continued)

- Staging Analysis S38
- Tech. Info. - Guid. Ref. Traj. Data S39 (XS - 621/M)
- Range Safety Report S41 (S - 34/M)
- Flight Term. Report S42 (S - 34/M)
- Guid. & Flight Cont. Anal. S44 (US-115)
- Crew Safety S W Req. Report S45
- Tech. Info. - Ordin. Safety Anal. S55 (XS - 621/M)
- Tech. Info. - Sys. Safety Anal. S57 (XS - 621/M)
- Tech. Info. - R F Suscept. Anal. S65 (XS - 621/M)
- Tech. Info. - Disper. Margin Anal. S66 (XS - 621/M)
- Gen. Flight Test Plan T4 (UT-13) T39
- PRD Input - Chg. T9 (T-21/M)
- System Test Obj. Inputs T10 (T - 123)
- Flight Crew Safety Plan Input
- Quick Look Ascent & Orbit Report
- Quick Look Post-Operations Report
- Flight Directors Handbook
- Flight Crew Handbook - Gemini B

GENERAL ELECTRIC ITEMS:

- Expl. Comp. Tech. Data B128 (US-411)
- SCN B044 (C-11)
- ECP's for CEI's B046 (C-13)
- ECP's for Sys. Req. Chg. B047 (C-12)
- ECP's After FACI B048 (C-19)
- Failure Mode & Effects Anal. B068 [(U) R - 408]
- Relib. Demonstration Study B070 [(U) R - 410]
- Hazard Analysis B075 [(U) S - 404]
- Power Status Report B076 [(U) S - 405]
- System/Design T S Reports B079 (S-54)
- PRD Input B110 [(U) T - 409]
- Flight Operations Support Study Report B111 [(U) T - 410]
- Dynamic Anal. Report B114 [(U) S - 406]
- OV Struct. Integrity Anal. Report B119 [(U) S - 407]

GENERAL ELECTRIC ITEMS: (Continued)

- LV Heat Trans. Anal. Report B121 [(U) S - 408]
- Elec. Sys. Schematic B122 [(U) E 402]
- System Test Objectives
- Quick Look Ascent & Orbit Report
- Flt. Directors Handbook
- Electro Magnetic Compatibility Anal. 235 [(U) S - (214]

MCDONNELL ITEMS:

- Electro Magnetic Compatibility Anal. 235 [(U) S - (214]
- GB Flt. Effectiveness Model Rpt. - 7R (U) R - (207)
- GB Pre. Ign. Model Report - 6R (U) R - (203)
- ECP's for CEI's - 16C (C-13)
- Manned Flt. Veh. Time Line - 265, [(U) S-22]
- ECP's General (After FACI) 18C (C-19)
- Failure Mode & Effect. Anal - 5R [(U) R - (205)]
- ECP's for Sys. Req. - 27C (C-12)
- S/C Instru. Sys. Rpt. - 135 [(U) S - (205)]
- Single Point Failure Anal. - 4R [(U) S - (204)]
- Load Anal. - Elect. Eqpt. - 125 [(U) S - (204)]
- Instru. Books A & B - 145 & 155 [(U) S - (206), (207)]
- Effectiveness Prog. Status Rpt. 1R, [(U) R - (201)]
- Specification Maint. Doc. - 15C (U) (C - 11)
- Interface Specifications - 28C [(U) C - (209)]
- Interface Maint. Document - 22C [(U) C - (205)]
- Aero Data Book - 215 [(U) S - (212)]
- Update Comm. System Technical Baseline
- Task Analysis Data (Crew Training) (U) S - (219)
- Flt. Dir. HB
- Flt. Crew HB (GB)
- Flt. Data File
- System Test Objectives (STO)
- Range Safety Report
- Quick Look Ascent & Orbit Report
- Quick Look Post Operations Report
- Elect. System Schematics (ESS)

MCDONNELL ITEMS: (Continued)

- Structural Design Loads 11S [(U) S - (203)]
- Flight Crew Safety Plan
- Radio Frequency Allocation (RFA) Request

DOUGLAS ITEMS:

- Flight Vehicle CEI B001 (C-2/M-1) Pt. I
- Specification Maintenance Document (CEI's) B136 & B137 (C-11)
- ECP's for System Requirement Change B138 (C-12)
- ECP's for CEI's B139 & B140 (C-13)
- ECP's - Post FACI B141 (C-19)
- Interface Specs. (IFS) B142 (UC-101)
- Interface Cont. Dwg. (ICD) B143 (UC-102)
- IFS/ICD Maintenance Document B144 (UC-103)
- As-Built Configuration List (AVE - CEI's B145 (UC-104)
- Interface Document Evaluation B195 (UE-101)
- Electrical System Schematic B197 (UE-103)
- Training Requirement Data (Flight Crew) B234 (UQ-101).
- System/Design Trade Study Reports B247 (S-54)
- System Safety Plan (SSP) B259 & B260 (US-101)
- LV Structure Integrity Analysis Report B261 (US-102)
- Stress, Fatigue & Dynamic Analysis Report B262 (US-103)
- Baseline Flight Vehicle Timeline B266 (US-108)
- Mission Status Summary B277 (US-121)
- Reliability Crit. Comp. Data Summary B303 (UT-114)
- PRD Inputs B305 (UT-116)
- Flight Directors Handbook Input
- Flight Crew Handbook Laboratory Vehicle
- Flight Crew Handbook Gemini B Input
- Command and Operations Handbook Input
- System Test Objectives
- Flight Crew Safety Plan
- Range Safety Report
- Quick Look Ascent and Orbit Report
- Quick Look Post-Operations Report

DOUGLAS ITEMS: (Continued)

- Radio Frequency Allocation (RFA) Request B335 (AFPI 7-4067)
- Launch Vehicle Data Book

AGENCY ITEMS:

- Program Support Plan (PSP)
- Operations Req. (OR) Pt. I, Pt. II
- System Test Objectives
- Operations Directive
- Trajectories - Ascent

The STD for Function 6.0 shall define requirements to a level of detail sufficient to provide a requirements source for preparation of the documents listed above and others that may evolve.

Specific references to contractual requirements documents by paragraph number are required in the appropriate RAS column.

STD shall be prepared using the procedures and formats of Part I of this Exhibit, as follows:

a. FFBD's per paragraph 3.2.1.
b. RAS's per paragraph 3.2.2, however, SPO approved equivalent contractors prepared forms and approaches may be used in lieu of Right Hand RAS's specified in Paragraph 3.2.2 of Part I.
c. TLS's per paragraph 3.2.3.
d. SBD's per paragraph 3.2.4 (Reference Part II, Section 3.2).
e. TSR's per paragraph 3.2.5.

Interface coding, furnished in Appendix A of Part II, shall be incorporated in the RAS's per paragraph 3.2.2 of Part I of this Exhibit.

3.1.6.4 Task Assignment

The Function Integrator for Function 6.0 is Martin-Marietta. Contributing associate contractors are Douglas MSSD, McDonnell Astronautics and General Electric. Martin-Marietta Corporation shall integrate data from United Technology Center, Aerojet General Corporation, A-C Electronics Division and Spacecraft Incorporated.

The Function Integration responsibility assigned to the Martin-Marietta Company above shall be for non-DORIAN KA mode requirements only.

For the KA mode, Eastman Kodak generated STD shall be integrated with General Electric STD by General Electric. The resulting integrated STD shall be suitably altered by General Electric to remove its DORIAN classification while still retaining interfacing requirements before submission to the Martin-Marietta Company.

The Function Integration responsibility for the total KB mode and DORIAN KA portions of Function 6.0 is assigned to Douglas MSSD. Contributing

associate contractors are General Electric and Eastman Kodak. As Function Integrator, Douglas shall perform the tasks noted in paragraph "a" below for the KB mode and DORIAN portions of the KA mode.

For both the KA and KB modes, the following shall apply:

General Electric shall prepare the FFBD's to include both the General Electric and Eastman Kodak functions. Eastman Kodak shall verify the FFBD's for their functions and coordinate changes desired with General Electric. Eastman Kodak shall prepare RAS's, TLS's, SBD's and TSR's to support the FFBD's and submit them to General Electric.

Eastman Kodak STD shall be integrated with General Electric STD by General Electric. In accomplishing this integration, General Electric shall perform the tasks noted in paragraph "a" below.

General Electric shall perform the tasks noted in paragraph "b" below for both General Electric STD and for the integrated General Electric/Eastman Kodak STD.

Eastman Kodak shall perform the tasks noted in paragraph "b" below in preparing and submitting STD to General Electric except for preparation of FFBD's.

a. The Function 6.0 Integrator shall:

1. Prepare, coordinate, and issue schedules for contractor/government agency participation in accordance with the master schedule issued by OSI.

2. Establish contractor assignments for review, comment, and expansion of flow diagrams and RAS's.

3. Identify the required timelines and make assignments for preparation.

4. Review contributed data and comments received from participants to identify incompatibilities in requirements, plans, or definitions reflected in the STD for Function 6.0. The Function Integrator shall inform the affected organizations of identified problems, request revised inputs and, if necessary, call a meeting of those involved to achieve a resolution.

5. Determine and insert interface coding in appropriate columns on RAS's per paragraph 3.1.6.3 above.

6. Prepare STD for distribution in accordance with paragraph 3.3 of Part II of this Exhibit.

7. As soon as possible after the function integration of each STD expansion has been completed, the Function Integrator shall release copies to participating contractors concurrent with submittal for system level integration to the MPI Contractor and OSI.

8. Respond to requests for clarification or revision of Function 6.0 STD if discrepancies are identified during system level integration. Coordinate as required.

b. Contributing Associate Contractor Tasks:

1. Prepare flow diagrams, RAS's, timelines and SBD's in format specified in Part I of this Exhibit and submit on 11x17 inch vellum to the Function Integrator and to the OSI. Flow diagram expansion and their attendant RAS and Timeline Sheet shall be submitted as a package for integration.

2. Respond to requests for clarification or revision of the contributed data if discrepancies are identified during integration.

c. MOL Program Integration Contractor as System Level Integrator of the STD shall:

1. Review Function 6.0 against other STD to identify possible inconsistencies or incompatibilities in functional descriptions and timing, defined interfaces and stated requirements, using as a guide the functional cross-references incorporated in the STD. Compare the boost interfaces identified in the functional schematics with the interface requirements defined in the RAS's to verify adequacy of interface definition.

2. Inform the appropriate Function Integrator of discrepancies, coordinate corrective action, and request OSI resolution, if required.

3. When the submitted STD is considered consistent across all related functions, the MPI Contractor shall recommend OSI approval.

d. The OSI shall:

1. Resolve inter-contractor/agency issues as necessary to properly guide the analysis and definition of boost requirements.

2. Approve and validate Function Integrator STD for use as system level integrated data.

3.1.7 Function 7.0 "Perform Installation, Checkout, Prelaunch Operations and Launch"

3.1.7.1 Function Description

For each MOL flight this function starts with arrival of the first item of AVE at the MLF and terminates at completion of MLF turnaround activities. For the AVE this function terminates at liftoff.

For the MLF activation this function begins with arrival of the first item of associate contractor furnished ground equipment at the MLF and terminates at completion of launch dress rehearsal for the first manned flight.

The analysis of this function shall include: (1) installation and checkout of AGE, facilities and associated software, (2) receipt, inspection, assembly, checkout, integrated testing, and launch of the flight articles, (3) post launch refurbishment/revalidation of MLF AGE, facilities and software, (4) backout following a scrub or maintenance recycle, (5) preparation for, delivery to and receipt of the flight crew at the flight crew at the SLC-6 and their subsequent activities.

The requirements for interface substitutes for MLF AVE checkout prior to electrical mating shall be developed as a part of this function.

3.1.7.2 Special Considerations

The requirements of VAFB upon MCC shall be identified in Function 7.0 and, conversely, the requirements of MCC upon VAFB shall be identified in Function 12.0. For maintenance purposes, Function 11.0 shall be referenced in Function 7.0.

3.1.7.3 Data Requirements

The Systems Technical Documentation (STD) will be used by the government agencies and shall be used by the associate contractors as a baseline reference description of the Installation and Checkout of the FV segment AGE and for prelaunch and launch activities for the FV segments. Detailed discussions for coordination of operational plans and technical interchanges for design definition of equipment required, shall be based on the STD to the extent practicable.

Planning and requirements documents which must be based on and/or be consistent with the Function 7.0 STD include the following:

NOTE: The planning and requirements documents listed below are the non-DORIAN versions. This list also applies to their DORIAN counterparts, as applicable. DORIAN-only documents will be added as they are identified.

HAMILTON STANDARD ITEMS:

- CEI (Prime Equipment) Pt. II A006 (C-3) A008 & A009
- CEI (ID Equipment) Pt. II A007 (C-8) A010 - A01A, A020
- ECP's for System Requirements Change A016 (C-12)
- ECP's for CEI's A017 (C-13)
- ECP's After FACI A018 (C-19)
- Specification Maintenance Document A019 (C-11)
- CEI Detail Specification (Prime Equipment) Pt. II A021 (C-4)
- Activation Manual Input A026 [(U) F-600]
- Preliminary Countdown Manual A027 [(U) H-600]
- Flight Crew Handbook (LV/Gemini B) A028 [(U) H-602]
- Flight Operations Crew Personnel Training Plan A038 [(U) Q-601]
- Launch Operations Crew Cert. Plan A039 [(U) Q-602]
- Flight Crew Safety Plan A040 [(U)S-600]
- System/Design Trade Study Report A041 (S-54)
- PSA Task Analysis A045 [(U)S-605]
- Cont. Vehicle Integration Test Procedures A047 [(U)T-601]
- Integration Assembly and C/O Plan A048 (T-5)
- PRD Inputs A053 [(U)T-603]
- Cont. Vehicle Segment C/O Requirements Plan A056 [(U)T-606]
- Checkout Requirements Plan
- Ground Safety Plan Inputs
- Test Procedures
- Launch Test Directive Inputs
- Launch Evaluation Report Inputs

MARTIN ITEMS:

- Specification Maintenance Documents C2 & C19 (C-11/M)
- ECP's for System Requirements Change C3 & C4 (C-12)
- ECP's for CEI's Part I C5 (C-13/M)
- ECP's for CEI's Part II C6 (C-19/M)
- CEI (Prime Equipment Part II C9 (C-3/M)
- CEI (Ident. Item) Part II C10 (C-8/M)
- CEI (Prime Equipment) Part II CPT01D01; C11(C-3/M)
- CEI (Ident. Item) Part II C12 (C-8/M)
- Specification Maintenance Document C19 (C-11/M)
- Engineering Data (Cat. B) Interface Cont. E3 (E-106/M)
- Design Loads Report S1 (US-111/M)
- Technical Information - Vehicle Elec. Requirements Study S7 (XS-621/M)
- Technical Information - EMC Study S8 (XS-621/M0
- Titan IIIM Data Book S9

MARTIN ITEMS:

- Technical Information - Stability Analysis S10 (XS-621/M)
- Prop. System Analysis Report S14 (US-114)
- Prop. Temp. Analysis (Launch) S15 (US-110)
- Struct. Dynamics Report S17 (US-112)
- Technical Information - Ref. Trajectory Analysis S35 (XS-621/M)
- Technical Information - Guid. Ref. Traj. Data S39 (XS-621/M)
- Technical Information - Prestest Traj. Data S40 (XS-621/M)
- Range Safety Report S41 (S-34/M)
- Pad Safety Report S43 (S-34/M)
- Technical Information - Ordin. Safety Analysis S55 (XS-621/M)
- Technical Information - System Safety Analysis S57 (XS-621/M)
- Activation Plan S64 (-S-35)
- Technical Information - RF Suscept. Analysis S65 (XS-621/M)
- Launch Test Directive T5(T-124/M)
- PRD Input - Change T9 (T-21/M)
- Countdown Manual Inputs T12 & T13 (T-125/M)
- Cont. Vehicle Integration Test Procedures
- Flight Crew Safety Plan Input
- Flight Operations Crew Training Plan
- Flight Crew Handbook - Gemini B
- Checkout Requirements Plan
- Test Procedures Launch Evaluation Report Inputs

GENERAL ELECTRIC ITEMS:

- Activation Manual B-124 (UF-(401))
- Activation Manual - Task Description B-133 (UF-403)
- CEI (Prime Equipment) Pt. II B007-B015 (C-3) B031
- CEI (ID) Pt. II B016-B030 (C-8)
- Version Description Document B035 [(U)C-404]
- Positional Handbook B037 [(U)K-401]
- Detail Specification (CC) Pt. II B043 (C-11)
- SCN B044 (C-11)
- ECP's for CEI's B046 (C-13)
- ECP's for System Requirements Change B047 (C-12)
- ECP's after FACI B048 (C-19)
- Hazard Analysis B075 [(U)S-404]
- Power Status Report B076 [(U)S-405]

GENERAL ELECTRIC ITEMS: (Continued)

- System Design Trade Study Reports B079 (S-54)
- EMC Test Plan B082 (T-12-28.0)
- Cont. Vehicle Segment C/O Requirements Plan
- Launch Operations Crew Cert. Plan B103 [(U)T-406]
- Rehearsal Plan (Input) B104 [(U)T-407]
- PRD Input B110 [(U)T-409]
- Launch Operations Support Study Report B112 [(U)T-411]
- Electrical System Schematic B122 [(U)E-402]
- Cont. Vehicle Integration Test Procedures
- Preliminary Countdown Manual
- Flight Operations Crew Training Plan
- Checkout Requirements Plan Part B
- Launch Test Directive Inputs
- Test Procedures
- Ground Safety Plan
- Launch Evaluation Report Inputs

MCDONNELL ITEMS:

- Electromagnetic Compatibility Analysis 235 [(U)S-(214)]
- Contractor Vehicle Segment C/O Requirements Plan 27T (U)T-(214)
- Program Requiremnts Document 19T (U)T-(116)
- GB Flight Effectiveness Model Report 7R (U)R-(207)
- Det. Integ. Activation Sched. & Activation Task Description 28T & 33T (U)T-(215) (No 33T)
- CEI Det. Spec. Part II, Facility (Facility Ident. Items) 37C to 39C (U) (C-7) (Not in CDRL)
- Effectiveness Assessment Plan 3R [(U)R-(203)]
- GB Pre-Ign. Model Report 6R (U)R-(206)
- Launch Operations Crew Cert. (LOCCP) 25T (U)T-(213)
- AGE Plan 5M [(U)M-(203)]
- ECP's for CEI's 16C (C-13)
- ECP's General (After FACI) 18C (C-19)
- ECP's for System Requirements 27C (C-12)
- CEI Det. Specs. Part II AGE (Prime Eqpt.) 3C to 10C (C-3)
- Acceptance Test Plan, AGE 21T (U)T-(209)
- Acceptance Test Plan GBPS 22T (U)T-(210)
- Version Description Document CPCEI GBPS 31C [(U)C-(214)]
- S/C Instru. Sys. Report 13S (U)S-(205)
- Technical Pub. - SC Famil. Manual 1H [(U)H-(201)]
- CEI Det. Specs. Pt. II-Ident. Items AGE 11C to 14C (C-8)

MCDONNELL ITEMS: (Continued)

- CEI Det. Specs. Pt. II, AVE (Prime Eqpt.) 1C U(C-3)
- CEI Det. Specs. Pt. II, AVE (Prime Eqpt.) Addenda 2C (C-4)
- Single Point Failure Analysis 4R [(U) R-(204)]
- Instru. Books A & B 14S & 15S (U)(S-(206, (207)
- Electro - Interference Test Plan 26T (T-12)
- Specification Maintenance Document 15C (C-11)
- Interface Specifications 28C (U)(C-(209))
- Interface Maintenance Document 22C [(U)C-(205)]
- Task Analysis Data (Crew Training) (U) S-(219)
- Flight Crew Handbook (Gemini B)
- Tech. Pub. - Flight Checklist Handbook
- Integrated Test Procedure Input
- Preliminary Countdown Manual - Inputs
- System Test Objectives (STO)
- Launch Test Directive (Inputs)
- Ground Safety Plan (Inputs)
- Range Safety Report
- Launch Evaluation Report (Inputs)
- Electrical System Schematics (ESS)
- Tech. Pub. - AGE Operations and Service Manual 4H [(U) H (201)]
- Structural Design Loads 11S [(U)S-(203)]
- Flight Operations Crew Personnel Training Plan
- Checkout Requirements Plan Part B
- Flight Crew Safety Plan
- Radio Frequency Allocation (RFA) Request
- Test Procedures

DOUGLAS ITEMS:

- Flight Vehicle CEI B001 (C-2/M-1) Pt. I
- CEI (Prime Equip.) Pt. II B346, B002-B074 (C-3/M-1)
- CEI (Ident. Item) Pt. II B079-B111 (C-8/M)
- Detail Spec (ECC) B112-B135 (C-10/M)
- Specification Maintenance Document (CEI's) B136 & B137 (C-11)
- ECP's for System Requirements Change B138 (C-12)
- ECP's for CEI's B139 & B140 (C-13)
- ECP's - Post FACI B141 (C-19)
- Interface Specifications (IFS) B142 (UC-101)

DOUGLAS ITEMS: (Continued)

- Interface Control Drawings (ICD) B143 (UC-102)
- IFS/ICD Maintenance Document B144 (UC-103)
- As-Built Configuration List (AVE - CEI's) B145 (UC-104)
- CEI Computer Program Pt. II B152-B156 (UC-106)
- Version Description Document (Computer Program) B160-B164 (UC-112)
- Interface Document Evaluation B195 (UE-101)
- Electrical System Schematic B197 (UE-103)
- Positional Handbook - Computer Program B203 & B204 (UH-101)
- Users Manual (Computer Program) B205-B209 (UH-102)
- Training Requirements Data (Flight Crew) B234 (UQ-101)
- Launch Operations Crew Cert. B235 (UQ-102)
- System/Design Trade Study Report B247 (S-54)
- System Safety Plan (SSP) B259 & B260 (US-101)
- Stress, Fatigue, and Dynamic Analysis Report B262 (US-102)
- Ground Safety Plan B279 (US-126)
- Electro-Interference Test Plan B282 (T-12)
- Ground Test Plan - Effectiveness B288 (UT-101)
- Item Test Plan (Computer Program) B292-B299 (UT-109)
- C/O Requirements Plan Part A B304 (UT-115)
- PRD Inputs B305 (UT-116)
- Flight Vehicle Checkout Plan -- Part A B307 (UT-118)
- Activation Manual Input B350 (UF-101)
- Activation Manual Input B351 (UF-101)
- Flight Operations Crew Training Plan Input
- Flight Crew Handbook Laboratory Vehicle
- Flight Crew Handbook Gemini B Input
- Command and Operations Handbook Input
- Checkout Requirements Plan Part B
- Cont. Vehicle Integ. Test Procedures
- Preliminary Countdown Manual
- Flight Crew Safety Plan
- Range Safety Report
- Radio Frequency Allocation (RFA) Request B335 (AFFI 7-4067)
- Launch Vehicle Data Book
- Test Procedures
- Launch Evaluation Report Inputs

AGENCY ITEMS:

- Program Support Plan (PSP)
- Operations Requirements (OR) Pt. I
- Operations Directive
- Launch Vehicle Data Book

The STD for Function 7.0 shall define requirements to a level of detail sufficient to provide a requirements source for preparation of the documents listed above and others that may evolve.

Specific references to contractual requirements documents by paragraph number shall be listed in the appropriate RAS column.

The RAS shall contain, in addition to the requirements of paragraph 3.2.2, a sequence of operation detailed enough to permit construction of the TLS and FFBD. Where not clearly stated in the Function Description, the scope and objective of the function shall be identified.

Preparation of TLS's shall consider the following rules:

"Greenlight" or nominal timelines shall be prepared initially; however, as sufficient information develops to do so, "redlight" or contingency time shall be added. "Redlight" time entries shall be clearly identified.

Periods of activity which are required to be continuous shall be identified for purposes of determining activity break points.

SBD's shall be used for definition of AVE to AGE and AGE to AGE interfaces during AVE operations and for AGE to AGE interfaces during AGE installation, checkout and demonstration.

STD shall be prepared using the procedures and formats of Part I of this Exhibit as follows:

a. FFBD's per paragraph 3.2.1.
b. RAS's per paragraph 3.2.2, however, SPO approved equivalent contractor prepared forms and approaches may be used in lieu of Right Hand RAS's specified in Paragraph 3.2.2 of Part I.
c. TLS's per paragraph 3.2.3.
d. SBD's per paragraph 3.2.4 (Reference Part II, Section 3.2).
e. TSR's per paragraph 3.2.5.

Interface coding, furnished in Appendix A of Part II, shall be incorporated in the RAS per paragraph 3.2.2 of Part I of this Exhibit.

3.1.7.4 Task Assignment

The Function 7.0 integration responsibility is assigned to Douglas MSSD. Contributing associate contractors are General Electric, McDonnell Astronautics,

Martin Marietta, and Hamilton Standard. Martin Marietta Corporation shall integrate data from United Technology Center, Aerojet General Corporation, A-C Electronics Division and Spacecraft Incorporated and shall submit the integrated TIIIM STD to the Function 7.0 Integrator.

General Electric shall prepare the FFBD's to include both the General Electric and Eastman Kodak functions. Eastman Kodak shall verify the FFBD's for their functions and coordinate changes desired with General Electric. Eastman Kodak shall prepare RAS's, TLS's, SBD's, and TSR's to support the FFBD's and submit them to General Electric.

Eastman Kodak STD shall be integrated with General Electric STD by General Electric. General Electric shall perform the tasks noted in paragraph (b) below to integrate the Eastman Kodak and General Electric STD.

General Electric shall perform the tasks noted in paragraph (b) below for both General Electric STD and for integrated General Electric/Eastman Kodak STD.

Eastman Kodak shall perform the tasks noted in paragraph (b) below in preparing and submitting STD to General Electric except for preparation of FFBD's.

a. The Function 7.0 Integrator shall:

1. Prepare, coordinate and issue schedules for contractor/government agency participation in accordance with the master schedule issued by the OSI.

2. Establish contractor assignments for review, comment, and expansion of flow diagrams and RAS's.

3. Identify the required timelines and make assignments for preparation.

4. Review contributed data and comments received from participants to identify incompatibilities in requirements, plans, or definitions reflected in the STD for Function 7.0. The Function Integrator shall inform the affected organizations of identified problems, request revised inputs and if necessary, call a meeting of those involved to achieve a resolution.

5. Determine and insert interface coding in appropriate columns on RAS's per paragraph 3.1.7.3 above.

6. Prepare STD for distribution in accordance with paragraph 3.3 of Part II of this Exhibit.

7. As soon as possible after the function integration of each STD expansion has been completed, the Function Integrator shall release copies to participating contractors concurrent with submittal for system level integration to the MPI Contractor and the OSI.

8. Respond to requests for clarification or revision of Function 7.0 STD if discrepancies are identified during system level integration. Coordinate as required.

b. Contributing Associate Contractor Tasks:

1. Prepare flow diagrams, RAS's, timelines, SBD's, and TSR's in format specified in Part I of this Exhibit and submit on 11x17 inch vellum to the Function Integrator. Flow diagram expansion and their attendant RAS and Timeline Sheet shall be submitted as a package for integration.

2. Respond to requests for clarification or revision of the contributed data if discrepancies are identified during integration.

c. MOL Program Integration Contractor as System Level Integrator of the STD shall:

1. Review Function 7.0 STD against other STD to identify possible inconsistencies or incompatibilities in functional descriptions and timing, defined interfaces and stated requirements, using as a guide the functional cross-references incorporated in the STD. Compare the interfaces identified in the functional schematics with the interface requirements defined in the RAS's to verify adequacy of interface definition.

2. Inform the appropriate Function Integrator of discrepancies, coordinate corrective action, and request OSI resolution, if required.

3. When the submitted STD is considered consistent across all related functions, the MPI Contractor shall recommend OSI approval.

d. The OSI shall:

1. Resolve inter-contractor/agency issues as necessary to properly guide the analysis and definition of requirements.

2. Approve and validate Function Integrator STD for use as system level integrated data.

3.1.8. Function 8.0 "Test, Accept, and Deliver MOL System"

3.1.8.1 Function Description

The functions to be analyzed for requirements start with the completion of fabrication of the first manufactured article of MOL AVE or supporting ground equipment, and proceed through evaluation tests, qualification tests, acceptance tests, and shipment to the MOL Launch Facilities (or other location, in the instance of certain AGE). The function terminates with delivery of the last manufactured article to VAFB for inspection, assembly and integration.

Each associate responsible for contributing equipment or software to the MOL Program shall analyze his own area of responsibility to define his equipment, test, and facility requirements. The requirements for factory interface substitutes (simulators) shall be developed as part of these functions.

3.1.8.2 Special Considerations

None.

3.1.8.3 Data Requirements

The STD for this function will be used by the government agencies and shall be used by the associate contractors as a baseline reference description for testing, acceptance and delivery of the MOL System. Detailed discussions for the purpose of coordination of operational plans and technical interchanges for design definition of equipment required shall be based on this STD to the extent practicable.

Planning and requirements documents which must be based on and/or be consistent with the Function 8.0 STD include the following:

NOTE: The planning and requirements documents listed below are the non-DORIAN versions. This list also applies to their DORIAN counterparts, as applicable. DORIAN-only documents will be added as they are identified.

HAMILTON STANDARD ITEMS:

- CEI (Prime Equip.) Pt. II A096 (C-3) A008 & A009
- CEI (ID Equip) Pt. II A007 (C-8) A010-A01A, A020
- ECP's for System Requirements Change A016 (C-12)
- ECP's for CEI's A017 (C-13)
- ECP's after FACI A018 (C-19)
- Specification Maintenance Document A019 (C-11)
- CEI Detail Spec. (Prime Equip.) Pt. II A-21 (C-4)
- System/Design Trade Study Report A041 (S-54)
- Category I Test Plan/Procedures A050 (T-102/M)
- Acceptance Test Procedures A051 (T-115)
- Cont. Vehicle Segment C/O Requirements Plan A056 [(U)T-606]

MARTIN ITEMS:

- Specification Maintenance Documents C2 & C19 (C-11/M)
- ECP's for System Requirements Change CE & C4 (C-12)
- ECP's for CEI's Pt I C5 (C-13/M)
- ECP's for CEI's Pt. II C6 (C-19/M)
- CEI (Prime Equip) Pt. II C9 (C-3/M)
- CEI (Ident. Item) Pt. II C10 (C-8/M)
- CEI (Prime Equip) Pt. II CPT01D01; C11 (C-3/M)
- CEI (Ident. Item) Pt. II C12 (C-8/M)
- Specification Maintenance Document C19 (C-11/M)
- Tech. Info. - Veh. Elec. Req. Study S7 (XS-621/M)
- Tech. Info. - EMC Study S8 (XS-621/M)
- Acceptance Test Procedures T1 & T2 (T-13) T39

GENERAL ELECTRIC ITEMS:

- CEI Acceptance Test Plan B131 (UT-401)
- CEI (Prime Equip.) Pt. II B007-B015 (C-3) B031
- CEI (ID) Pt. II B016-B030 (C-8)
- Version Description Document B035 [(U)C-404]
- Positional Handbook B037 [(U)H-401]
- Detail Spec. (CC) Pt. II B043 (C-11)
- SCN B044 (C-11)
- ECP's for CEI's B046 (C-13)
- ECP's for System Requirements Change B047 (C-12)

GENERAL ELECTRIC ITEMS: (Continued)

- ECP's after FACI B048 (C-19)
- Mission Crit. Comp. Plan Report B064 [(U)R-404]
- System/Design Trade Study Reports B079 (S-54)
- Ground Test Plan Input B083 [(U)T-404]
- Cont. Veh. Seg. C/O Requirements Plan
- CEI Acceptance Test Plan B087 [(U)T-401]
- CEI Qualification Test Plan B089 [(U)T-405] B101
- CEI Evaluation/Qualification Test Plan B090-B094 [(U)T-405]
- CEI Acceptance Test Plan B095-B100 [(U)T-401] B102

MCDONNELL ITEMS:

- Electromagnetic Compatibility Analysis 23S [(U)S-(214)]
- Crew Transfer Test Plan 7T (U)T-(201)
- Structural Qual. Test Plan 2T (U)T-(201)
- CEI Det. Spec. Part II, Facility (Facility Ident. Items) 37C-39C (C-7) (Not in CDRL)
- Effectiveness Assessment Plan 3R [(U)R-(203)]
- Altitude Sep. Test Plan 5T (U)T-(201)
- Ejection Seat Function Test Plan 4T (U)T-(201)
- AGE Plan 5M [(U)M-(203)]
- ECP's for CEI's 16C (C-13)
- Acceptance Test Plan, AVE 20T (U)T-(208)
- ECP's General (after FACI) 18C (C-19)
- Performance/Design Requirements Report GBPS 25C [(U)C-(208)]
- ECP's for System Requirements 27C (C-12)
- CEI Det. Specs. Pt. II, AGE (Prime Eqpt.) 3C-10C (C-2)
- Acceptance Test Plan, AGE 21T (U)T-(209)
- Acceptance Test Plan GBPS 22T (U)T-(210)
- Item Test Plan GBPS Computer Program 29T (U)T-(216)
- CEI Pt. II, GBPS Computer Program 30C [(U)C-(211)]
- S/C Therm. - Vac. Test Plan 6T (U)T-(201)
- Version Description Document, CPCEI, GBPS 31C [(U)C-(214)]
- Item Test Procedures, GBPS Computer Program 30T (U)T-(217)
- S/C Instru. System Report 13S (U)S-(205)
- CEI Det. Specs. Pt. II Ident. Items AGE 11C-14C (C-8)
- CEI Det. Specs. Pt. II, AVE (Prime Eqpt.) 1C U (C-3)

MCDONNELL ITEMS: (Continued)

- CEI Det. Specs. Pt. II, AVE (Prime Eqpt.) Addenda 2C (C-4)
- Single Point Failure Analysis 4R [(U)R-(204)]
- Instru. Books A & B 14S & 15S (U)S-(206, (207)
- Electro-Interference Test Plan 26T (T-12)
- Specification Maintenance Document 15C (C-11)
- Interface Specifications 28C (U) C-(209)
- Interface Maintenance Document 22C [(U)C-(205)]
- Test Procedures, SST 16T (U)T-(205)
- Acceptance Test Procedures, AGE 15T (U)T-(205)
- AVE Computer Software Acceptance Test Procedure 32T (U)T-(219)
- REM/Adapter Wind Tunnel Test Plan 1T (U)T-(201)
- ESTU Test Plan 3T (U)T-(201)
- Design Approval (Qual.) Test Procedures 10T (U)T-(203)
- Acceptance Test Procedures - GBPS 24T [(U)T-(205)]
- Ground Test Plan

DOUGLAS ITEMS:

- CEI (Prime Equip.) Pt. II B346, B002-B074 (C-3/M-1)
- CEI (Ident. Item) Pt. II B079-B111 (C-8/M)
- Detail Spec. (ECC) B112-B135 (C-10/M)
- Specification Maintenance Document (CEI's) B136 & B137 (C-11)
- ECP's for System Requirements Change B138 (C-12)
- ECP's for CEI's B139 & B140 (C-13)
- ECP's - Post FACI B141 (C-19)
- As-Built Configuration List (AVE-CEI's)
- CEI Computer Program Pt. II B152-B156 (UC-106)
- Version Description Document (Computer Program) B160-B164 (UC-112)
- Interface Document Evaluation B195 (UE-101)
- Positional Handbook - Computer Program B203 & B204 (UH-104)
- Users Manual (Computer Program) B205-B209 (UH-102)
- System/Design Trade Study Reports B247 (S-54)
- Electro-Interference Test Plan B282 (T-12)
- Ground Test Plan - Acceptance B287 (UT-101)
- Ground Test Plan - Effectiveness B288 (UT-101)
- LM Qualification Test Requirements and Procedures B293 (UT-107)
- Item Test Plan (Computer Program) B294-B299 (UT-109)
- Item Test Procedures (Computer Program) B308-B312 (UT-119)

The STD for Function 8.0 shall define requirements to a level of detail sufficient to provide a requirements source for preparation of the documents listed above and others that may evolve.

Specific references to contractual requriements documents by paragraphs number shall be provided in the appropriate RAS column.

STD shall be prepared using the procedures and formats of Part I of this Exhibit as follows:

a. FFBD's per paragraph 3.2.1.

b. RAS's per paragraph 3.2.2, [NOTE: SPO approved equivalent contractor prepared forms and approaches may be used in lieu of Right Hand RAS's specified in Paragraph 3.2.2 of Part I.] except as follows: Due to the nature of Block 8.0, there shall be two different formats of RAS used in the expansion of the function. For the top level functions and those not describing test functions, the RAS, as described in Part I of this Exhibit, shall be used. However, for functions describing the test activities, the following format shall be required.

   1. SCOPE - The scope of the function shall be a narrative description of the activity to be accomplished. Included shall be beginning and ending points of the activity and it shall be written in a form that can be inserted directly into a plan. At each level, the detail will be as required to develop the next level of operations in a Functional Flow Block Diagram.
   2. PRIME OBJECTIVES - Shall be a "brief" description of the "prime" objectives to be accomplished.
   3. PREREQUISITE AND SERVICING REQUIREMENTS - Shall list the required prerequisites to be accomplished prior to start of the function plus the necessary servicing of the test item, such as water, power, liquid O_2, etc.
   4. END ITEM CONFIGURATION - Shall give the detail configuration of the item under test. In some cases such as the Laboratory Module, a list of the items missing from the flight configuration may be used in place of a list or definition of all items in the configuration.

5. TEST CONFIGURATION - Shall list the AGE and Simulators required to perform the function. Included as a reference to this section will be the Schematic Block Diagram.

6. TEST CONSTRAINTS - Shall contain design and operating constraints as they apply to the activity and/or equipment identified. Example of constraints are:
   (a) Operating cycles and time limitations on equipment.
   (b) Critical sequence of events that must be followed.
   (c) Design and operating constraints imposed by CEI Specifications and/or Applicable Military and/or Government standards and specifications.
   (d) Operating conditions which are hazardous in nature and restrict activity.
   (e) Interfaces which must be accomplished prior to initiation of the activity under consideration.
   (f) Time allotted to perform operation.

7. TEST REQUIREMENTS (Operations) - Shall identify requirements on AGE, Facility, personnel, and shall list mandatory sequence necessary in performing the activities of the function. For lower level test functions, the requirement will be as detailed as necessary to define the operation or objectives to be verified by a procedure.

In some cases, additional sections shall be added to the RAS in order to give a better definition of the function. An example of possible candidates are:
   (a) Data Requirement.
   (b) Personnel Requirement.
   (c) Man/Machine Interface.

d. SSBD's per paragraph 3.2.4 (Reference Part II, Section 3.2).

e. TSR's per paragraph 3.2.5.

Interface coding, furnished in Appendix A of Part II, shall be incorporated in the RAS per paragraph 3.2.2 of Part I of this Exhibit.

3.1.8.4 Task Assignment

The Function 8.0 integration responsibility has been assigned to Douglas MSSD. Contributing associate contractors are General Electric, McDonnell Astronautics, Martin-Marietta and Hamilton Standard. Martin-Marietta Corporation shall integrate data from United Technology Center, Aerojet General Corporation, A-C Electronics Division and Spacecraft Incorporated and shall submit the integrated T-IIIM STD to the Function 8.0 Integrator. The MOL Program Office will furnish Agency information.

General Electric shall prepare the FFBD's to include both the General Electric and Eastman Kodak functions. Eastman Kodak shall verify the FFBD's for their functions and coordinate changes desired with General Electric. Eastman Kodak shall prepare RAS's, TLS's, SBD's, and TSR's to support the FFBD's and submit them to General Electric.

Eastman Kodak STD whall be integrated with General Electric STD by General Electric. General Electric shall perform the tasks noted in paragraph "a" below to integrate General Electric and Eastman Kodak STD.

General Electric shall perform the tasks noted in paragraph "b" below for both General Electric STD and for integrated General Electric/Eastman Kodak STD.

Eastman Kodak shall perform the tasks noted in paragraph "b" below in preparing and submitting STD to General Electric except for preparation of FFBD's.

a. The Function 8.0 Integrator shall:
   1. Prepare, coordinate and issue schedules for contractor/government agency participation in accordance with the master schedule issued by the OSI.
   2. Establish contractor assignments for review, comment and expansion of flow diagrams and RAS's.
   3. Identify the requried timelines and make assignments for preparation.
   4. Review contributed data and comments received from participants to identify incompatibilities in requirements, plans, or definitions reflected in the STD for Function 8.0. The Function Integrator shall inform the affected organizations of identified problems, request revised inputs and, if necessary, call a meeting of those involved to achieve a resolution.

5. Determine and insert interface coding in appropriate columns on RAS's per paragraph 3.1.8.3 above.

6. Prepare STD for distribution in accordance with paragraph 3.3 of Part II of this Exhibit.

7. As soon as possible after the function integration of each STD expansion has been completed, the Function Integrator shall release copies to participating contractors concurrent with submittal for system level integration to the MPI Contractor and OSI.

8. Respond to requests for clarification or revision of Function 8.0 STD if discrepancies are identified during system level integration. Coordinate as required.

b. Contributing Associate Contractor Tasks:

1. Prepare flow diagrams, RAS's, timelines, SBD's, and TSR's in format specified in Part I of this Exhibit and submit on 11x17 inch vellum to the Function Integrator. Flow diagram expansion and their attendant RAS and Timeline Sheet shall be submitted as a package for integration.

2. Respond to requests for clarification or revision of the contributed data if discrepancies are identified during integration.

c. MOL Program Integration Contractor (Douglas) as System Level Integrator of the STD shall:

1. Review Function 8.0 STD against other STD to identify possible inconsistencies or incompatibilities in functional descriptions and timing, defined interfaces and stated requirements; using as a guide the functional cross-references incorporated in the STD. Compare the interfaces identified in the functional schematics with the interface requirements defined in the RAS's to verify adequacy of interface definition.

2. Inform the appropriate Function Integrator of discrepancies, coordinate corrective action, and request OSI resolution, if required.

3. When the submitted STD is considered consistent across all related functions, the MPI Contractor shall recommend OSI approval.

d. The OSI shall:

1. Resolve inter-contractor/agency issues as necessary to properly guide the analysis and definition of test, acceptance and delivery requirements.

2. Approve and validate Function Integrator STD for use as system level integrated data.

3.1.9 Function 9.0, "Perform Training and Perform Simulation"

3.1.9.1 Function Description

The objectives of this function are to define for each manned flight the training requirements necessary to prepare the flight crew, biomedical, and MCC personnel for accomplishing the assigned tasks during all phases of the MOL Mission. The training requirements identified shall provide the basis for planning academic instruction, briefings, demonstrations, formal courses, operation of test articles, part-task training and simulations, development simulations, and mission simulations. The training requirements should encompass nominal, contingency, and emergency operations.

An additional objective of the function is to define additional requirements for the simulation equipment to obtain specific technical data required for engineering design to; define mission procedures, verify telemetry mode design, verify MCC displays and procedures, validate flight plans and mission rules, verify system operating concepts and timelines, exercise the AVE and MCC software, and rehearse the mission.

All affected associate contractors and agencies shall identify and provide inputs to this function.

3.1.9.2 Special Considerations

Function 9.0, as defined herein, combines the essential aspects of Functions 9.0 and 10.0 which were defined in the CDP.

3.1.9.3 Data Requirements

The STD for this function will be used by the government agencies and shall be used by the associate contractors as a baseline reference description of Flight Crew, biomedical and MCC personnel training and simulation requirements. Coordination of training plans and simulator operations plans shall be based on this STD to the extent practicable.

Planning and requirements documents which must be based on and/or be consistent with Function 9.0 STD include:

NOTE: The planning and requirements documents listed below are the non-DORIAN versions. This list also applies to their DORIAN counterparts, as applicable. DORIAN-only documents will be added as they are identified.

Training Requirements Data (Flt. Crew)
B234 (UQ-101)
ORD Inputs
B281 (UT-141)
Orbital Support Plan
Flight Crew Training Plan
Mission Simulator Operations Plan
Training Schedules
CEI Part II Mission Simulator
CEI Part II Flight Crew Equipment Orbiting Vehicle
CEI Part II Laboratory Vehicle, MOL
CEI Part I OTEF
IFS
ICD
As Built Configuration List
CEI Part I, Computer Program, LMSE
CEI Part I, Computer Program, On Board
CEI Part I, Computer Program, Integrated Mission Simulator
CEI Part II, Computer Program, LMSE
CEI Part II, Computer Program, On Board
CEI Part II, Computer Program, Integrated Mission, Simulator
Computer Program Interface Spec. (MMC)
Computer Program Interface Spec. (MAC)
Version Description Document, Computer Program Set On Board Computer
Version Description Document, LMSE Computer Program
Version Description Document, Computer Program Integrated, Mission Sim.
Positional Handbook, Computer Program, Integrated, Mission Simulator
Users Manual (Computer Program), LMSE
Users Manual (Computer Program), On Board Computer
Users Manual (Computer Program), Mission Simulator, Integrated
Computer Program Interface Spec. LMSE MMSE

The STD for Function 9.0 shall define requirements to a level of detail sufficient for preparation of the documents listed above and others that may evolve. The functional flow block diagram shall be developed to the lowest level at which time sequencing of the training or simulation blocks is required.

The RAS shall contain a description of the Block, a list of training/simulation requirements generated by the Block, a description of the mode of training (lecture, exercise, etc.), a list of equipment and facilities needed, and the time required to accomplish the training/simulation. If simulation/training requirements, equipment, facilities or times are listed in another deliverable document, they need not be duplicated in the RAS, but specific references shall be given to provide traceability to those items omitted from the RAS.

The RAS for non-training uses of the simulator should contain a description of the Block, the specific requirements that are generated within the Block, a listing of the equipment, and the time needed to satisfy the requirements.

STD shall be prepared using the procedures and formats of Part I of this Exhibit, as follows:

a. FFBD's per paragraph 3.2.1.
b. RAS's per paragraph 3.2.2; however, SPO approved equivalent contractor prepared forms and approaches may be used in lieu of Right Hand RAS's specified in paragraph 3.2.2 of Part I.

Interface coding, furnished in Appendix A of Part II, shall be incorporated in the RAS per paragraph 3.2.2 of Part I of this Exhibit.

3.1.9.4 Task Assignment

The Function 9.0 integration responsibility is assigned to Douglas MSSD. Contributing associates are McDonnell Astronautics, Hamilton Standard, General Electric and Martin-Marietta. Martin-Marietta Corporation shall integrate data from United Technology Center, Aerojet General Corporation, A-C Electronics Division and Spacecraft Incorporated and shall submit the integrated T-III STD to the Function 9.0 Integrator.

General Electric shall prepare the FFBD's to include both the General Electric and Eastman Kodak functions. Eastman Kodak shall verify the FFBD's for their functions and coordinate changes desired with General Electric. Eastman Kodak shall prepare RAS's, TLS's, SBD's, and TSR's to support the FFBD's and submit them to General Electric.

Eastman Kodak STD shall be integrated with General Electric STD by General Electric. General Electric shall perform the tasks noted in paragraph (a) below to integrate the Eastman Kodak and General Electric STD.

General Electric shall perform the tasks noted in paragraph (b) below for both General Electric STD and for integrated General Electric/Eastman Kodak STD.

Eastman Kodak shall perform the tasks noted in paragraph (b) below in preparing and submitting STD to General Electric except for preparation of FFBD's.

a. The Function 9.0 Integrator shall:

1. Prepare, coordinate and issue schedules for contractor/government agency participation in accordance with the master schedules issued by OSI.

2. Establish contractor and government agency assignments for review, comment and expansion of flow diagrams and RAS's.

3. Review contributed data and comments received from participants to identify incompatibilities in requirements, plans or definitions reflected in the STD for Function 9.0. The Function Integrator shall inform the affected organizations of identified problems, request revised inputs and, if necessary, call a meeting of those involved to achieve a resolution.

4. As soon as possible after the function integration of each STD expansion has been completed, the Function Integrator shall release copies to participating contractors/agencies concurrent with submittal for system level integration to the MPI Contractor and OSI.

5. Respond to requests for clarification or revision of Function 9.0 STD if discrepancies are identified during system level integration. Coordinate as required.

6. Determine and insert interface coding in appropriate columns on RAS's per paragraph 3.1.9.3 above.

b. Contributing Associate Contractor Tasks:

1. Prepare flow diagrams, RAS's, and timelines in format specified in Part I of this Exhibit and submit on 11x17 inch vellum to the Function Integrator and to the OSI. Flow diagram expansion and its attendant RAS shall be submitted as a package for integration.

2. Respond to requests for clarification or revision of the contributed data if discrepancies are identified during integration.

c. MOL Program Integration Contractor as System Level Integrator of the STD shall:

1. Review Function 9.0 STD against other STD to identify possible inconsistencies or incompatibilities in functional descriptions and stated requirements, using as a guide the functional cross-references incorporated in the STD.

2. Inform the appropriate Function Integrator of discrepancies, coordinate corrective action, and request OSI resolution, if required.

3. When the submitted STD is considered consistent across all related functions, MPI shall recommend OSI approval.

d. The OSI shall:

1. Resolve inter-contractor/agency issues as necessary to properly guide the analysis and definition of training and simulation requirements.

2. Approve Function Integrator STD for use as system level integrated data.

3.1.10 Function 10.0, "Perform Mission Simulations"

NOTE: Function 10.0 HAS BEEN COMBINED WITH Function 9.0.

3.1.11 Function 11.0, "Maintain System"

3.1.11.1 Function Description

These functions include all preventive and corrective maintenance of AVE, AGE, AAE, and facilities, including ground maintenance before and during flight, and on-orbit maintenance of the Orbiting Vehicle. In the case of corrective maintenance, only the maintenance analysis subsequent to receipt of malfunction detection shall be accomplished as a part of this function. Malfunction detection requirements (as well as redundant, alternate, or degraded methods of operation) shall be analyzed as a part of basic functions covered in other functions, as appropriate. In the case of preventive maintenance, only those requirements that are not a true prerequisite (i.e., "in series") to an "operational" function shall be analyzed as part of this function. "In series" preventive maintenance requirements shall be analyzed as a part of the related basic "operational" functions.

This function starts after receipt of the first contract end item at the using site and terminates with completion of normal retrieval operations.

3.1.11.2 Special Considerations

The following interfaces with other functions have been established:

1. Function 11.1 (Perform Primary Maintenance) interfaces with Function 7.8 (Perform Recycle Operations). This interface is required to assure a transition from the operational flow to the maintenance flow and return to the operational flow. The result is a maintenance flow which includes both operational and maintenance functions; when the same function is required for both Function 11.1 and 7.8, it shall be included in Function 7.8 and referenced in Function 11.1.

2. Function 11.2 (Perform On-Orbit Maintenance) interfaces with Function 4.0 (Perform On-Orbit Objectives) to assure a transition from the on-orbit maintenance.

3.1.11.3 Data Requirements

The STD for this function shall be used as a baseline reference description of maintenance functions and requirements. Detailed discussions and coordination of maintenance problems and solutions that affect design and define equipment requirements shall be based on Function 11.0 STD where practicable.

Planning and requirements documents which must be based on and/or be consistent with Function 11.0 STD include the following:

NOTE: The planning and requirements documents listed below are the non-DORIAN versions. This list also applies to their DORIAN counterparts, as applicable. DORIAN-only documents will be added as they are identified.

HAMILTON STANDARD ITEMS:

- ECP's for System Requirements Change A016 (C-12)
- ECP's for CEI's A017 (C-13)
- ECP's after FACI A018 (C-19)
- Specification Maintenance Document A019 (C-11)
- Flight Crew Handbook (LV/Gemini B) A028 [(U)H-602]
- Maintenance Requirements Data A031 [(U)L-600]
- Maintenance Kit Manual A033 [(U)L-602]
- Flight Operations Crew Personnel Training Plan A038 [(U)Q-601]
- Flight Crew Safety Plan A040[(U)S-600]
- System/Design Trade Study Report A041 (S-54)
- PSA Task Analysis A045 [(U)S-605]
- PRD Inputs A053 [(U)T-603]

MARTIN ITEMS:

- Specification Maintenance Documents C2 & C19 (C-11/M)
- ECP's for System Requirements Change C3 & C4 (C-12)
- ECP's for CEI's Pt. I C5 (C-13/M)
- ECP's for CEI's Pt. II C6 (C-19M)
- Specification Maintenance Document C19 (C-11/M)
- PRD Input - Cahnge T9 (T-21/M)
- Flight Operations Crew Training Plan

GENERAL ELECTRIC ITEMS:

- SCN B044 (C-11)
- ECP's for CEI's B046 (C-13)
- ECP's for System Requirements Change B047 (C-12)
- ECP's after FACI B048 (C-19)
- Reliability/Maintenance Measure. Plan B061 [(U)R-402]
- Reliability/Maintenance Apportion Report B063 [(U)R-403]
- Mission Crit. Comp. Plan Report B064 [(U)R-404]
- Failure Mode and Effectiveness Analysis B068 [(U)R-408]
- Reliability Demonstration Study B070 [(U)R-410]
- Hazard Analysis B075 [(U)S-404]
- Power Status Report B076 [(U)S-405]
- System/ Design Trade Study Report B079 (S-54)
- Rehearsal Plan (Input) B104 [(U)T-407]
- Launch Operations Support Study Report B112 [(U)T-411]

GENERAL ELECTRIC ITEMS: (Continued)

- Flight Operations Crew Training Plan
- Flight Crew Handbook Laboratory Vehicle

MCDONNELL ITEMS:

- Program Requirements Document 19T (U)T-(116)
- Effectiveness Assessment Plan 3R [(U)R-(203)]
- AGE Plan 5M [(U)M-(203)]
- ECP's for CEI's 16C (C-13)
- ECP's General (after FACI) 18C (C-19)
- Failure Mode and Effectiveness Analysis 5R [(U)R-(205)]
- ECP's for System Requirements 27C (C-12)
- S/C Instru. System Report 13S (U)S-(205)
- Tech. Pub. - SC Famil. Manual 1H [(U)H(201)]
- Specification Maintenance Document 15C (C-11)
- AVE Preventive Maintenance Rqt. Summary 9R (R-209)
- Flight Crew Technical Volume
- Task Analysis Data (Crew Training (U)S-(219)
- Ground Safety Plan (Inputs)
- Tech. Pub. - GB Proc. Sim. Ops. Handbook 2H [(U)H(201)]
- Tech. Pub. - AGE Ops. and Service Manual 4H [(U)H(201)]
- Flight Operations Crew Personnel Training Plan

DOUGLAS ITEMS:

- Specification Maintenance Document (CEI's) B136 & B137 (C-11)
- ECP's for System Requirements Change B138 (C-12)
- ECP's for CEI's B139 & B140 (C-13)
- ECP's - Post FACI B141 (C-19)
- Interface Document Evalution B195 (UE-101)
- Maintenance Data Reports B213 (UL-101)
- Training Requirements Data (Flight Crew) B234 (UQ-101)
- System/Design Trade Study Reports B247 (S-54)
- System Safety Plan (SSP) B259 & B260 (US-101)
- Mission Status Summary B277 (US-121)
- Ground Safety Plan B279 (US-126)
- ORD Inputs B281 (UT-141)
- Ground Test Plan - Effectiveness B288 (UT-101)
- PRD Inputs B305 (UT-116)

DOUGLAS ITEMS: (Continued)

- Flight Operations Crew Training Plan Input
- Flight Crew Handbook Laboratory Vehicle
- Flight Crew Safety Plan
- Quick Look Post-Operations Report

AGENCY ITEMS:

- Program Support Plan (PSP)
- Orbital Support Plan (OSP)
- Operations Requirements (OR), Pt. I and Pt. II
- System Test Objectives
- Operations Directive

The STD for Function 11.0 shall define requirements to a level of detail sufficient to provide a requirements source for preparation of the documents listed above and others that may evolve.

Specific references to contractual requirements documents by paragraph number shall be provided in the appropriate RAS column.

STD shall be prepared using the procedures and formats of Part I of this Exhibit, as follows:

a. FFBD's per paragraph 3.2.1.
b. RAS's per paragraph 3.2.2, however, SPO approved equivalent contractor prepared forms and approaches may be used in lieu of Right Hand RAS's specified in Paragraph 3.2.2 of Part I.
c. TLS's per paragraph 3.2.3.
d. SBD's per paragraph 3.2.4 (Reference Part II, Section 3.2).
e. TSR's per paragraph 3.2.5.

Interface coding, furnished in Appendix A of Part II, shall be incorporated in the RAS per paragraph 3.2.2 of Part I of this Exhibit.

3.1.11.4 Task Assignment

The Function 11.0 integration responsibility has been assigned to Douglas MSSD. Contributing associate contractors are McDonnell Astronautics, Hamilton Standard, General Electric, and Martin-Marietta. Martin Marietta Corporation shall integrate data from United Technology Center, Aerojet General Corporation, A-C Electronics Division and Spacecraft Incorporated and shall submit the integrated T-IIIM STD to the Function 11.0 Integrator.

For the DORIAN portions, the following shall apply:

General Electric shall prepare the FFBD's to include both the General Electric and Eastman Kodak functions. Eastman Kodak shall verify the FFBD's for their functions and coordinate changes desired with General Electric. Eastman Kodak shall prepare RAS's, TLS's, SBD's, and TSR's to support the FFBD's and submit them to General Electric.

Eastman Kodak STD shall be integrated with General Electric STD by General Electric. General Electric shall perform the tasks noted in paragraph "a" below to integrate the Eastman Kodak and General Electric STD.

General Electric shall perform the tasks noted in paragraph "b" below for both General Electric STD and for integrated General Electric/Eastman Kodak STD.

Eastman Kodak shall perform the tasks noted in paragraph "b" below in preparing and submitting STD to General Electric except for preparation of FFBD's.

a. The Function 11.0 Integrator shall:

1. Prepare, coordinate and issue schedules for contractor/government agency participation in accordance with the master schedule issued by the OSI.

2. Establish contractor assignments for review, comment and expansion of flow diagrams and RAS's.

3. Identify the required timelines and make assignments for preparation.

4. Review contributed data and comments received from paritic̣pants to identify incompatibilities in requirements, plans, or definitions reflected in the STD for Function 11.0. The Function Integrator shall inform the affected organizations of identified problems, request revised inputs, and, if necessary, call a meeting of those involved to achieve a resolution.

5. Determine and insert interface coding in appropriate columns on RAS's per paragraph 3.1.11.3 above.

6. Prepare STD for distribution in accordance with paragraph 3.3 of Part II of this Exhibit.

7. As soon as practicable after the function integration of each STD expansion has been completed, the Function Integrator shall release copies to participating contractors/agencies concurrent with submittal for system level integration to the MPI Contractor and OSI.

8. Respond to requests for clarification or revision of Function 11.0 STD if discrepancies are identified during system level integration. Coordinate as required.

b. Contributing Associate Contractor Tasks:

1. Prepare flow diagrams, RAS's, timelines, SBD's, and TSR's in format specified in Part I of this Exhibit and submit on

11 X 17 inch vellum to the Function Integrator and to the OSI. Flow diagram expansion and their attendant RAS and Timeline Sheet shall be submitted as a package for integration.

2. Respond to requests for clarification or revision of the contributed data if discrepancies are identified during integration.

c. MOL Program Integration Contractor as System Level Integrator of the STD shall:

1. Review Function 11.0 STD against other STD to identify possible inconsistencies or incompatibilities in functional descriptions and timing, defined interfaces and stated requirements, using as a guide the functional cross-references incorporated in the STD. Compare the maintenance interfaces identified in the functional schematics with the interface requirements defined in the RAS's to verify adequacy of interface definition.

2. Inform the appropriate Function Integrator of discrepancies, coordinate corrective action, and request OSI resolution, if required.

3. When the submitted STD is considered consistent across all related functions, the MPI Contractor shall recommend OSI approval.

d. The OSI shall:

1. Resolve inter-contractor/agency issues as necessary to properly guide the analysis and definition of maintenance requirements.

2. Approve and validate Function Integrator STD for use as system level integrated data.

3.1.12 Function 12.0, "Perform Mission Control"

3.1.12.1 Function Description

This function begins at the start of prelaunch activities and terminates with the release of all of the recovery forces.

Each associate contractor shall develop his mission control and associated requirements as part of his participation in the analysis of requirements for the assigned functions derived from the overall system function breakdown described in Section 3.1 of Part I of this Exhibit. Included are Mission Control requirements for the processes of monitoring, receiving and/or transmitting infromation bearing on the flight, or on the readiness to commence or terminate flight, and the associated requirements imposed on all of the networks and stations involved. This includes the requirements for control and voice communications, weather and sea condition forecasts, tracking, telemetry, command, and data recording, transmission, and reduction. Status reporting and displays, and real-time mission evaluation requirements shall also be developed.

3.1.12.2 Special Considerations

The analysis effort shall be oriented to define the SCF and range support requirements only in sufficient depth to permit extraction of requirements as direct inputs to the appropriate support documentation specified in the MOL Documentation Plan: No reference to methods of implementation shall be included. This function overlaps Function 7.0 from the start of prelaunch activities. During this period, Function 12.0 requirements shall be those for MCC and MCC to VAFB interface.

3.1.12.3 Data Requirements

The STD for this function will be used by government agencies and shall be used by participating associate contractors as a baseline reference description for Mission Control operations. Detailed discussions for coordination of operational plans and technical interchanges for design definition of equipment required, shall be based on this STD to the extent practicable.

Planning and requirements documents which must be based on and/or be consistent with the Function 12.0 STD includes the following:

NOTE: The planning and requirements documents listed below are the non-DORIAN versions. This list also applies to their DORIAN counterparts, as applicable. DORIAN-only documents will be added as they are identified.

HAMILTON STANDARD ITEMS:

- o ECP's for System Requirement Change A016 (C-12)
- o ECP's for CEI's A017 (C-13)
- o ECP's After FACI A018 (C-19)
- o Spec. Maintenance Document A019 (C-11)
- o Flight Directors Handbook A029 [(U) H - 604]
- o Flight Operations Crew Personnel Training Plan A038 [(U) Q - 601]
- o System/Design T S Report A041 (S-54)
- o PRD Inputs A053 [(U) T - 603]

MARTIN ITEMS:

- o Spec. Maintenance Documents C2 & C19 (C-11/M)
- o ECP's for System Requirement Change C3 & C4 (C-12)
- o ECP's for CEI's Pt. I C5 (C-13/M)
- o ECP's for CEI's Pt. II C6 (C-19M)
- o Spec. Maintenance Document C19 (C-11/M)
- o PRD Input - Change T9 (T-21/M)
- o Quick Look Ascent & Orbit Report
- o Quick Look Post-Operations Report
- o Flight Operations Crew Training Plan
- o Flight Directors Handbook

GENERAL ELECTRIC ITEMS:

- o Version Description Document B035 [(U) C - 404]
- o Positional Handbook B037 [(U) H - 401]
- o SCN B044 (C-11)
- o ECP's for CEI's B046 (C-13)
- o ECP's for System Requirement Change B047 (C-12)
- o ECP's After FACI B048 (C-19)
- o Failure Mode & Effects Analysis B068 [(U) R - 408]
- o Reliability Demonstration Study B070 [(U) R - 410]
- o System/Design T S Report B079 (S-54)
- o Rehearsal Plan (Input) B104 [(U) T - 407]
- o PRD Input B110 [(U) T - 409]
- o Flight Operations Support Study Report B111 [(U) T - 410]

GENERAL ELECTRIC ITEMS: (Continued)

- Launch Operations Support Study Report B112 [(U) T - 411]
- Quick Look Ascent & Orbit Report
- Quick Look Post-Operations Report
- Flight Operations Crew Training Plan
- Flight Directors Handbook
- Mission Simulator Operations Handbook Vol. II Simulator Handbook
- Command and Operations Handbook

MCDONNELL ITEMS:

- Manned Recovery Requirement Document - 18T [(U) T - (207) - (221)]
- Program Requirement Document - 19T [(U) T - (116)]
- Orbital Requirement Document - 17T [(U) T - 221) (Manned)]
- ECP's for CEI's - 16C (C-13)
- Manned Flight Vehicle Time Line - 26S [(U) (S-22)
- ECP's General (After FACI) - 18C (C-19)
- Failure Mode & Effect. Anal. - 5R [(U) R - (205)]
- ECP's for System Requirement - 27C (C-12)
- CEI Det. Specs. Part II, AGE (Prime Eqpt.) - 3C T010C, (C-3)
- Version Description Document, CPCEI, GBPS - 31C [(U) C - (214)]
- Instrumentation Books A & B - 145 & 155 [(U) S - (206), (207)]
- Specification Maintenance Document - 15C (U) (C - 11)
- Flight Dir. HB
- Flight Crew HB (Laboratory Vehicle)
- Flight Crew HB (Gemini B)
- Flight Data File
- Recovery HB - Manned
- System Test Objectives (STO)
- Quick Look Ascent & Orbit Report
- Quick Look Post Operations Report
- Guidance Simulation Definition 12R [(U) R - 212]
- Flight Operations Crew Personnel Training Plan
- Mission Simulator Operations Handbook, Volume II

DOUGLAS ITEMS:

- Specification Maintenance Document (CEI's) B136 & B137 (C-11)
- ECP's for System Requirement Change B138 (C-12)
- ECP's for CEI's B139 & 140 (C-13)
- ECP's - Post FACI B141 (C-19)
- CEI Computer Program, Pt. II B152 & B156 (UC-106)
- Computer Program IFS B158 & B159 (UC-110)
- Version Description Document (Computer Program) B160 & B164 (UC-112)
- Interface Document Evaluation B195 (UE-101)
- Positional Handbook - Computer Program B203 & B204 (UH-101)
- Users Manual (Computer Program) B205 - B209 (UH-102)
- System/Design Trade Study Reports B247 (S-54)
- System Safety Plan (SSP) B259 & B260 (US-101)
- Mission Status Summary B277 (US-121)
- ORD Inputs B281 (UT-141)
- PRD Inputs B305 (UT-116)
- Item Test Proc. (Computer Program) B308 - B312 (UT-119)
- Flight Operations Crew Training Plan Input
- Flight Directors Handbook Input
- Mission Simulator Operations Handbook Vol. I LV Proc.
- Mission Simulator Operations Handbook Vol. II Simulator Handbook Input
- Command and Operations Handbook Input
- Quick Look Ascent & Orbit Report
- Quick Look Post-Operations Report

AGENCY ITEMS:

- Program Support Plan (PSP)
- Orbital Support Plan (OSP)
- Recovery Support Plan (RSP)
- Manned Recovery Support Plan (MRSP)
- Operations Requirement (OR) Pt. I, Pt. II
- Mission Simulator Operations Handbook Vol. II Simulator Handbook Input
- System Test Objectives
- Operations Directive
- Flight Termination System (Fts.) Report
- Recovery Safety Plan
- Trajectories - Ascent

The STD for Function 12.0 shall define requirements to a level of detail sufficient to provide a requirements source for preparation of the documents listed above and others that may evolve. Specific references to contractual requirements documents by paragraph number shall be provided in the appropriate RAS column.

STD shall be prepared using the procedures and formats of Part I of this Exhibit as follows:

a. FFBD's per paragraph 3.2.1.
b. RAS's per paragraph 3.2.2, however, SPO approved equivalent contractor prepared forms and approaches may be used in lieu of Right Hand RAS's specified in Paragraph 3.2.2 of Part I.
c. TLS's per paragraph 3.2.3.
d. SBD's per paragraph 3.2.4 (Reference Part II, Section 3.2).
e. TSR's per paragraph 3.2.5.

Interface coding, furnished in Appendix A of Part II, shall be incorporated in the RAS per paragraph 3.2.2 of Part I of this Exhibit.

3.1.3.4 Task Assignment

The Function 12.0 integration responsibility has been assigned to Douglas MSSD. Contributing associate contractors are General Electric, McDonnell Astronautics, Hamilton Standard and Martin Marietta. Martin Marietta Corporation shall integrate data from United Technology Center, Aerojet General Corporation, A-C Electronics Division and Spacecraft Incorporated and shall submit the integrated T-IIIM STD to the Function 12.0 Integrator.

General Electric shall prepare the FFBD's to include both the General Electric and Eastman Kodak functions. Eastman Kodak shall verify the FFBD's for their functions and coordinate changes desired with General Electric. Eastman Kodak shall prepare RAS's, TLS's, SBD's, and TSR's to support the FFBD's and submit them to General Electric.

Eastman Kodak STD shall be integrated with General Electric STD by General Electric. General Electric shall perform the tasks noted in paragraph (a) below to integrate the Eastman Kodak and General Electric STD.

General Electric shall perform the tasks noted in paragraph (b) below for both General Electric STD and for integrated General Electric/Eastman Kodak STD.

Eastman Kodak shall perform the tasks noted in paragraph (b) below in preparing and submitting STD to General Electric except for preparation of FFBD's.

a. The Function 12.0 Integrator shall:

1. Prepare, coordinate and issue schedules for contractor/government agency participation in accordance with the master schedule issued by the OSI.

2. Establish contractor assignments for review, comment, and expansion of flow diagrams and RAS's.

3. Identify the requried timelines and make assignments for preparation.

4. Review contributed data and comments received from participants to identify incompatibilities in requriements, plans, or definitions reflected in the STD for Function 12.0. The Function Integrator shall inform the affected organizations of identified problems, request revised inputs and, if necessary, call a meeting of those involved to achieve a resolution.

5. Determine and insert interface coding in appropriate columns on RAS's per paragraph 3.1.12.3 above.

6. Prepare STD for distribution in accordance with paragraph 3.3 of Part II of this Exhibit.

7. As soon as possible after the function integration of each STD expansion has been completed, the Function Integrator shall release copies to participating contractors/agencies concurrent with submittal for system level integration to the MPI Contractor and OSI.

8. Respond to requests for clarification or revision of Function 12.0 STD if discrepancies are identified during system level integration. Coordinate as required.

b. Contributing Associate Contractor Tasks:

1. Prepare flow diagrams, RAS's, timelines, SBD's, and TSR's in format specified in Part I of this Exhibit and submit on 11x17

inch vellum to the Function Integrator and to the OSI. Flow diagram expansion and their attendant RAS and Timeline Sheet shall be submitted as a package for integration.

2. Respond to requests for clarification or revision of the contributed data if discrepancies are identified during integration.

c. MOL Program Integration Contractor (Dougals) as System Level Integrator of the STD shall:

1. Review Function 12.0 STD against other STD to identify possible inconsistencies or incompatibilities in functional descriptions and timing, defined interfaces and stated requirements, using as a guide the functional cross-references incorporated in the STD. Compare interfaces identified in the functional schematics with the interface requirements defined in the RAS's to verify adequacy of interface definition.

2. Inform the appropriate Function Integrator of discrepancies, coordinate corrective action, and request OSI resolution, if required.

3. When the submitted STD is considered consistent across all related functions, the MPI Contractor shall recommend OSI approval.

d. The OSI shall:

1. Resolve inter-contractor/agency issues as necessary to properly guide the analysis and definition of mission control requirements.

2. Approve and validate Function Integrator STD for use as system level integrated data.

3.1.13 Function 13.0, "Perform Abort Operations"

3.1.13.1 Function Description

This function consists of the operations to be performed in the event of imminent or existing MOL System malfunctions that prevent the continuance of the normal mission.

The function objective is to insure the safety of the crew and, where possible, to fulfill a modified mission objective. This may involve either: (1) crew escape, (2) crew escape with DRC's, or (3) continuing a shortened mission.

The function shall include all abort situations in the KA mode which can occur at any time subsequent to the ingress of the Flight Crew into the Gemini B. The function shall include all abort situations in the KB mode which can occur subsequent to the start of the final countdown. The function starts with receipt of a signal indicating an incipient or existing failure anywhere in the Flight Vehicle and the need for emergency termination of the mission or initiation of emergency operations. In the principal flight modes of operation, the Flight Crew will make the final abort decision.

The function termination is dependent upon the mode of abort operation. In circumstances that allow a modified mission objective, Function 13.0 will end with the achievement of safe orbit. For those anomalies that require crew escape operations, Function 13.0 terminates after landing and upon arrival of useful assistance to the crew, including retrieval or verification of positive disposal of mission revealing data and equipment.

3.1.13.2 Special Considerations

Definition of specific requirements for crew escape equipment, personnel operations and capabilities, and timing requirements shall be correlated with the AVE/AAE/AGE/crew requirements and constraints developed in Functions 3.0, 4.0, 5.0, 6.0, 7.0 and 12.0/ground crew.

In the development of Function 13.0 STD, appropriate Functions 3.0, 4.0 and 5.0 STD shall be incorporated by reference in the 13.0 flow diagram when directly applicable.

3.1.13.3 Data Requirements

The STD for this function will be used by the government agencies and shall be used by the associate contractors as a baseline reference description of abort operations. Detail discussions for coordination of operational plans and technical requirements for design definition shall be based on this STD to the extent practicable.

Planning and requirements documents which must be based on and/or be consistent with the Function 13.0 STD include the following:

NOTE: The planning and requirements documents listed below are the non-DORIAN versions. This list also applies to their DORIAN counterparts, as applicable. DORIAN-only documents will be added as they are identified.

HAMILTON STANDARD ITEMS:

- ECP's for System Requirement Change A016 (C-12)
- ECP's for CEI's A017 (C-13)
- ECP's After FACI A-18 (C-19)
- Specification Maintenance Document A019 (C-11)
- Flight Crew Handbook (LV/Gemini B) A028 [(U) H - 602]
- Flight Directors Handbook A029 [(U) H - 604]
- Technical Publications - Recovery Handbook A030 [(U) H - 605]
- MRRD A032 [(U) L - 601]
- Flight Operations Crew Personnel Training Plan A038 [(U) Q - 601]
- Flight Crew Safety Plan A040 [(U) S - 600]
- System/Design T S Report
- PSA Task Analysis A045 [(U) S - 605]
- PRD Inputs A053 [(U) T - 603]

MARTIN ITEMS:

- Specification Maintenance Document C2 & C19 (C-11/M)
- ECP's for System Requirement Change C3 & C4 (C-12)
- ECP's for CEI's Pt. I C5 (C-13/M)
- ECP's for CEI's Pt. II C6 (C-19M)
- Specification Maintenance Document C19 (C-11/M)
- Missile Explosive Comp. Technical Data Sheet H1 (H-4)
- Range Safety Report S41 (S-34/M)
- PRD Input - Change T9 (T-21/M)
- Flight Crew Handbook - Gemini B

GENERAL ELECTRIC ITEMS:

- SCN B044 (C-11)
- ECP's for CEI's B046 (C-13)
- ECP's for System Requirement Change B047 (C-12)
- ECP's After FACI B048 (C-19)
- Failure Mode & Effects Analysis B068 [(U) R - 408]
- Reliability Demonstration Study B070 [(U) S - 410]
- Hazard Analysis B075 [(U) S - 404]
- Power Status Report B076 [(U) S - 405]
- System/Design T S Reports B079 (S-54)

GENERAL ELECTRIC ITEMS: (Continued)

- Rehearsal Plan (Input) B104 [(U) T - 407]
- Flight Operations Support Study Report B111 [(U) T - 410]

MCDONNELL ITEMS:

- Manned Recovery Requirement Document 18T [(U) T - (207) (221)]
- Program Requirement Document 19T [(U) T (116)]
- GB Flight Effectiveness Model Report 7R [(U) R - (207)]
- Orbital Requirement Document 17T [(U) T - 221)(Manned)]
- Eject. Seat Function Test Plan - 4T [(U) T - (201)]
- ECP's for CEI's - 16C (C-13)
- Manned Flight Vehicle Time Line 265, (U) (S-221)
- ECP's General (After FACI) 18C (C-19)
- Failure Mode & Effectiveness Analysis 5R [(U) R - (205)]
- ECP's for System Requirement 27C (C-12)
- Version Description Document CPCEI GBPS - 31C [(U) C - (214)]
- S/C Instru. System Report 135 [(U) S - (205)]
- Single Point Failure Analysis 4R [(U) R - (204)]
- Explosive Component Technical Data Sheet 18S [(U) S - (209)]
- Load Analysis - Elect. Eqpt. 12S [(U) S - (204)]
- Instrumentation Books A & B 145 & 155 [(U) S (206), (207)]
- Effectiveness Prog. Status Report 1R [(U) R - (201)]
- Specification Maintenance Document 15C (U) (C-11)
- Interface Specifications 28C [(U) C - (209)]
- Interface Maintenance Document 22C [(U) C - (205)]
- Aero Data Book 215 [(U) S - (212)]
- Internal Crew Transfer Testing O - G
- Update Communication System Technical Baseline
- Task Analysis Data (Crew Training)(U) S-(219)
- Flight Dir. HB
- Flight Crew HB (Laboratory Vehicle)
- Flight Crew HB (Gemini B)
- Flight Data File
- Recovery HB - Manned
- Preliminary Countdown Manual - Inputs
- System Test Objectives (STO)

MCDONNELL ITEMS: (Continued)

- Ground Safety Plan (Inputs)
- Range Safety Report
- Electrical System Schematics (ESS)
- Structural Design Loads 11S [(U) S - (203)]
- Flight Operations Crew Personnel Training Plan
- Flight Crew Safety Plan
- Flight Termination System (Fts) Report
- Radio Frequency Allocation (RFA) Request

DOUGLAS ITEMS:

- Specification Maintenance Document (CEI's) B136 & B137 (C-11)
- ECP's for System Requirement Change B138 (C-12)
- ECP's for CEI's B139 & B140 (C-13)
- ECP's - Post FACI B141 (C-19)
- Interface Documentation Evaluation B195 (UE-101)
- Electrical System Schematic B197 (UE-103)
- System/Design Trade Study Reports B247 (S-54)
- Explosive Comp. Technical Data Sheet B268 (US-111)
- Mission Status Summary B277 (US-121)
- ORD Inputs B281 (UT-141)
- PRD Inputs B305 (UT-116)
- Range Safety Report
- Radio Frequency Allocation (RFA) Request B335 (AFPI 7-4067)

AGENCY ITEMS:

- Program Support Plan (PSP)
- Orbital Support Plan (OSP)
- Recovery Support Plan (RSP)
- Manned Recovery Support Plan (MRSP)
- Operations Requirements (OR) Pt. I, Pt. II
- System Test Objectives
- Operations Directive
- Flight Termination System (FTS) Report
- Recovery Safety Plan

The STD for Function 13.0 shall define requirements to a level of detail sufficient to provide a requirements source for preparation of the documents listed above and others that may evolve. When functions are expanded to amplify the definition of operational sequences and interfaces beyond this level of detail, the Left Hand RAS shall be limited to the function description and interface requirement. Emphasis shall be placed on the definition of operational activities and operational interfaces between Launch Operations, Flight Vehicle, Mission Control and Recovery Forces. Specific references to contractual requirements documents by paragraph number shall be shown in the appropriate RAS column.

STD shall be prepared using the procedures and formats of Part I of this Exhibit, as follows:

a. FFBD's per paragraph 3.2.1.
b. RAS's per paragraph 3.2.2, however, SPO approved equivalent contractor prepared forms and approaches may be used in lieu of Right Hand RAS's specified in Paragraph 3.2.2 of Part I. (NOTE: LH RAS's for procedural functions may be limited to a function description and interface requirements, as appropriate.)
c. TLS's per paragraph 3.2.3.
d. SBD's per paragraph 3.2.4 (Reference Part II, Section 3.2).
e. TSR's per paragraph 3.2.5, or comparable contractors Design Note or Technical Note format.

Interface coding, furnished in Appendix A of Part II, shall be incorporated in the RAS per paragraph 3.2.2 of Part I of this Exhibit.

3.1.13.4 Task Assignment

The Function 13.0 integration responsibility has been assigned to McDonnell Astronautics (MCASTRO). Contributing associate contractors are Douglas MSSD, General Electric, Martin-Marietta, Hamilton Standard and the OSI. Martin-Marietta Corporation shall integrate data from United Technology Center, Aerojet General Corporation, A-C Electronics Division and Spacecraft Incorporated and shall submit the integrated T-IIIM STD to the Function 13.0 Integrator.

The Function Integration responsibility assigned to McDonnell Astronautics Company above shall be for non-DORIAN requirements only. In this case, Eastman Kodak generated STD shall be integrated with General Electric STD

by General Electric. The resulting integrated STD shall be suitably altered by General Electric to remove its DORIAN classification while still retaining interfacing requirements before submission to McDonnell Astronautics.

The Function Integration responsibility for the DORIAN portions of Function 13.0 is assigned to Douglas MSSD. Contributing associate contractors are General Electric and Eastman Kodak. As Function Integrator, Douglas shall perform the tasks noted in paragraph "a" below for the DORIAN portions.

General Electric shall prepare the FFBD's to include both the General Electric and Eastman Kodak functions. Eastman Kodak shall verify the FFBD's for their functions and coordinate changes desired with General Electric. Eastman Kodak shall prepare RAS's, TLS's, SBD's, and TSR's to support the FFBD's and submit them to General Electric.

Eastman Kodak STD shall be integrated with General Electric STD by General Electric. General Electric shall perform the tasks noted in paragraph "a" below to integrate the Eastman Kodak and General Electric STD.

General Electric shall perform the tasks noted in paragraph "b" below for both General Electric STD and for integrated General Electric/Eastman Kodak STD.

Eastman Kodak shall perform the tasks noted in paragraph "b" below in preparing and submitting STD to General Electric except for preparation of FFBD's.

a. The Function 13.0 Integrator shall:
   1. Prepare, coordinate and issue schedules for contractor/government agency participation in accordance with the master schedule issued by the OSI.
   2. Establish contractor assignments for review, comment, and expansion of flow diagrams and RAS's. This shall include coordination of contractor definitions of functional abort requirements.
   3. Identify the required timelines and make assignments for preparation.
   4. Review contributed data and comments received from participants to identify incompatibilities in requirements, plans, or definitions reflected in the STD for Function 13.0. The Function Integrator shall inform the affected organizations of identified problems, request revised inputs and, if necessary, call a meeting of those involved to achieve a resolution.

5. Determine and insert interface coding in appropriate columns on RAS's per paragraph 3.1.13.3 above.

6. Prepare STD for distribution in accordance with paragraph 3.3 of Part II of this Exhibit.

7. As soon as possible after the function integration of each STD expansion has been completed, the Function Integrator shall release copies to participating contractors concurrent with submittal for system level integration to the MPI Contractor and OSI.

8. Respond to requests for clarification or revision of Function 13.0 STD if discrepancies are identified during system level integration. Coordinate as required.

b. Contributing Associate Contractor Tasks:

1. Prepare flow diagrams, RAS's and timelines in format specified in Part I of this Exhibit and submit on 11x17 inch vellum to the Function Integrator and to the OSI. Flow diagram expansion and their attendant RAS and Timeline Sheet shall be submitted as a package for integration.

2. Respond to requests for clarification or revision of the contributed data if discrepancies are identified during integration.

c. MOL Program Integration Contractor (Douglas) as System Level Integrator of the STD shall:

1. Review Function 13.0 STD against other STD to identify possible inconsistencies or incompatibilities in functional descriptions and timing, defined interfaces and stated requirements, using as a guide the functional cross-references incorporated in the STD. Compare the abort interfaces identified in the functional schematics with the interface requirements defined in the RAS's to verify adequacy of interface definition.

2. Inform the appropriate Function Integrator of discrepancies, coordinate corrective action, and request OSI resolution, if required.

3. When the submitted STD is considered consistent across all related functions, the MPI Contractor shall recommend OSI approval.

d. The OSI shall:

1. Resolve inter-contractor/agency issues as necessary to properly guide the analysis and definition of abort requirements.

2. Approve and validate Function Integrator STD for use as system level integrated data.

3.2 • SCHEMATIC DIAGRAMS

Schematic diagrams relate system elements or segments, rather than mission functions. An integrated set of schematic diagrams is required to identify inter-segment and intra-segment interfaces from the MOL System level down to the subsegment or subsystem level. The schematics shall identify interfaces between all system elements (equipment, personnel, facilities and software or documentation) using a systemwide codification which systematically identifies each system segment and its sub parts. See Addendum A of Part II for coding definition. The code is unique and permits schematic diagram traceability from the top down or the bottom up. Traceability of identified interfaces to interface requirement definition documents including the system specification, RAS's, CEI's, and IFS's shall be provided. See Figure 1 for sample.

The schematics which have been prepared for selected subsystems or subsegments shall be integrated into the complete tree of MOL System schematics (system level) by the MPI Contractor. Various formats of schematics have been employed in their preparation. It is mandatory that the schematics at each lower level be prepared in a manner that makes it possible to relate the system level schematics to any and all lower level schematics which have been or may be generated within a given segment. The prime objective is to provide visibility into the composition of the system and its component elements.

3.2.1 MOL System Top Level Schematic Diagram

For the purpose of schematically presenting the composition of the MOL System, the system level schematic diagram, Figure 1A, identifies the interface relationships between the basic segments. Figure 1A supersedes the overt system level schematic diagram, Figure 9 in Part I of this Exhibit, and shall be used in all DORIAN program definition. Unique identification of each physical entity precludes the incorporation in the system schematics of a segment such as the "Orbiting Vehicle," which is actually a composite of parts of the basic segments. For the same reason, the "Mission Simulator Segment" schematic is excluded.

FORM 606-058 (6-67)

INTERFACE NUMBER		SS-MOL-1 PARAGRAPH REFERENCE	SYSTEM ENGINEERING FUNCTION REFERENCE	REFERENCE
K11.1/K10.1MX	GEMINI B AVE/LABORATORY VEHICLE AVE - MECHANICAL	3.3.1.1 3.3.2.1, 2 3.3.3.1, 2	3.1, 3.4, 3.6, 5.4, 5.7, 5.9, 6.4, 6.5, 7.2, 11.1, 13.32, 13.33, 13.34, 13.35	CEI 58A010A, 58A011A, 58A012 CEI 207013A IFS-MOL-106002
K11.1/K10.1EX	GEMINI B AVE/LABORATORY VEHICLE AVE - ELECTRICAL	3.3.2.1, 2 3.3.3.1, 2	3.1, 3.2, 3.4, 3.5, 3.6, 4.1, 4.3, 4.6, 5.2, 5.3, 5.6, 6.4, 6.5, 7.1, 7.2, 11.1, 13.32, 13.33, 13.34, 13.35	CEI 58A010A 58A011A, 58A012 CEI 207013A IFS-MOL-106002
K11.1/K10.1GX	GEMINI B AVE/LABORATORY VEHICLE AVE - GASEOUS	3.3.2.2 3.3.3.2	3.1, 3.4, 4.3, 5.4, 5.6, 6.4, 6.5, 11.1 13.32, 13.33, 13.34 13.35	CEI 58A010A 58A011A, 58A012 CEI 207013A IFS-MOL-106002
K11.1/K10.1VX	GEMINI B AVE/LABORATORY VEHICLE AVE - ENVIRONMENTAL	3.3.2.2 3.3.3.2	3.1, 3.4, 3.6, 4.3, 5.1, 5.4, 5.6, 5.7, 6.4, 6.5, 13.32, 13.33, 13.34, 13.35	CEI 58A010A, 58A011A, 58A012A CEI 207013A IFS-MOL-106002
K11.1/K10.2MX	GEMINI B AVE/LABORATORY VEHICLE AGE - MECHANICAL	3.3.2.2 3.3.3.2 4.1.1.5 4.1.2.5	8.1, 8.2	CEI 58A010A, 58A011A, 58A012 CEI 207264A, 207242A 207014A, 207124A IFS-MOL-106005, 106006, 106007, 106009
K11.1/K10.2EX	GEMINI B AVE/LABORATORY VEHICLE AGE - ELECTRICAL	3.3.2.2 3.3.3.2 4.1.1.5 4.1.2.5	8.1, 8.2	CEI 58A010A 58A011A, 58A012 CEI 207264A, 207242A IFS-MOL-106005, 106006, 106007, 106009
K11.1/K10.2VX	GEMINI B AVE/LABORATORY VEHICLE AGE - ENVIRONMENTAL	3.3.2.2 3.3.3.2 4.1.1.5	8.1, 8.2	CEI 58A010A 58A011A, 58A012 CEI 207264A, 207242A

	FUNCTIONAL DIAGRAM TITLE AND NUMBER	FUNCTIONAL FLOW BLOCK DIAGRAM
	K11.0 GEMINI B SYSTEM SEGMENT FIRST-LEVEL SCHEMATIC DIAGRAM REF: MOL SYSTEM TOP-LEVEL	CONTRACTOR MCDONNELL ST. LOUIS, MISSOURI
PRE-FI	REV & DATE _____ ORIG DATE _____ APPROVAL _____	DOC NO. K11.0-SD PG _____
FI	REV & DATE _____ ORIG DATE _____ VERIFIED _____	DOC NO. _____ PG _____
SLI	REV & DATE _____ ORIG DATE _____ VERIFIED _____	DOC NO. _____ PG _____

Figure 1 Interface Traceability

~~SECRET~~ SPECIAL HANDLING

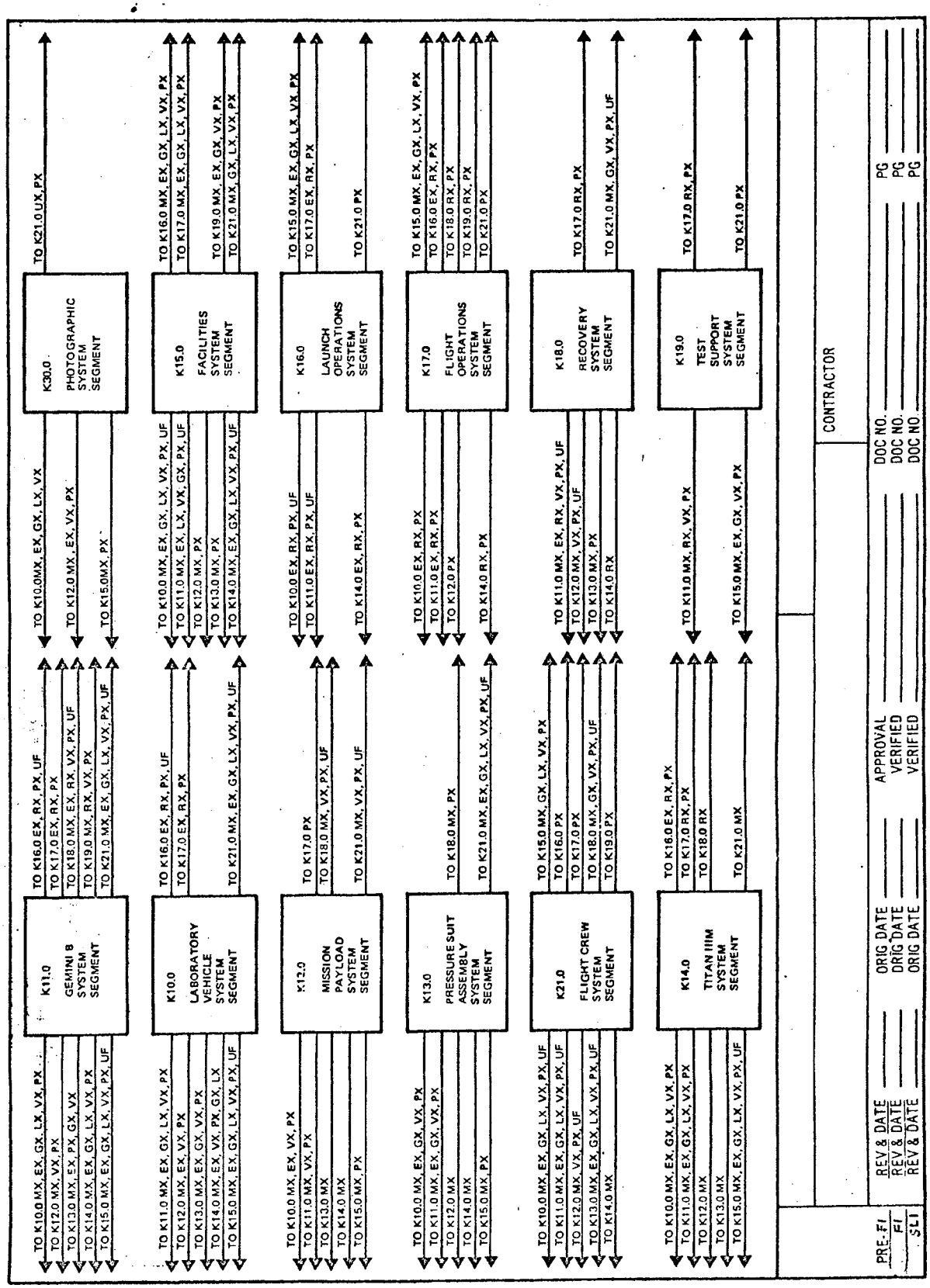

Figure 1A Top Level Schematic Block Diagram

The interfaces identified in the system level schematic shall be coded in a manner to indicate the types of interfaces between any two segments. The code used for segment identification and interface type designation is given in the addendum to the covert Part II.

3.2.2 Segment Schematic Diagrams

3.2.2.1 Preparation

A segment-level (first-level) schematic diagram shall be prepared for each of the system segments by the responsible organizations. The format shown in Part I, Figure 10, shall be used. These diagrams shall be based on the code given in Addendum A to the covert Part II, and shall identify inter-segment and intrasegment interfaces by specific type. Interfaces shall be summarized on a format as given in Figure 1; these summary sheets, which become part of the document, provide further descriptions of the interfaces and traceability to the SP/DR, RAS's, CEI Specifications, IFS documents, and other pertinent documents. The responsible organizations shall prepare any required revisions for their segment schematic diagrams.

3.2.2.2 Integration

The MPI Contractor shall verify that the interfaces identified on each of the segment-level schematic diagrams are properly reflected on the diagrams for the other segments.

3.2.3 Lower Level Schematic Diagrams

Each organization responsible for a system segment shall prepare sub-segment-level schematic diagrams in the manner prescribed in 3.2.2 above. At least second-level schematic diagrams shall be prepared for each sub-segment. Additional diagrams shall be prepared, if required, to make these system engineering schematic diagrams compatible with any other schematic diagrams which are in CEI's, IFS's, or other pertinent documents.

3.2.4 Responsibilities

3.2.4.1 Preparation

The preparation and coordination of segment, sub-segment, and subsystem

schematic diagrams shall be the responsibility of the following designated organizations:

K10.0 Laboratory Vehicle System Segment - DAC MSSD
K11.0 Gemini B System Segment - MCASTRO
K12.0 Mission Payload System Segment - GE
K13.0 Pressure Suit Assembly System Segment - Hamilton Standard
K14.0 Titan IIIM System Segment - Martin Marietta
K30.0 Photographic System Segment - Eastman Kodak

MOL Program Office Furnished Schematics:

K15.0 Facilities System Segment
K16.0 Launch Operations System Segment
K17.0 Flight Operations System Segment
K18.0 Recovery System Segment
K19.0 Test Support System Segment
K21.0 Flight Crew System Segment

3.2.4.2 Integration

The MPI Contractor shall verify that inter-segment interfaces identified on any segment or subsegment schematic diagram are compatible with all of the related segment diagrams.

3.2.4.3 Review

Prior to issuing schematic diagrams of any level prepared by associate contractors, the MPI Contractor and the responsible segment organizations noted in 3.2.4.1 shall review all schematic diagrams and verify the validity of identified intersegment interfaces. Intra-segment interface validity shall be the responsibility of the segment organizations. The MPI Contractor will assist the OSI in evaluation of schematics furnished by the MOL Program Office as noted in 3.2.4.1.

3.3 SUBMITTAL OF DATA

Format for data shall be as shown in paragraph 3.0 of Part 1. Data inputs to the Function Integrating Contractor (FIC) shall be on 11 X 17 inch vellums. Copies of FIC Data shall be sent to all contributors and to other associates on 8-1/2 X 11 inch vellums. FIC submittals to OSI and MPI Contractor (Douglas) shall be on 8-1/2 X 11 inch vellums.

3.3.1 Collation of Data

The Integrated Technical Requirements Baseline Data Package shall consist of 13 volumes, one for each top level Function. The volume for Function 1.0 shall be STD 207-01, Function 2.0 shall be STD 207-02, etc. Each volume shall consist of six or more books which shall be structured as follows:

Book 1 shall contain the FFBD's.
Book 2 shall contain the Timeline Sheets.
Book 3 shall contain the SBD's.
Book 4 shall contain R.H. RAS's (if applicable).
Book 5 shall contain the Maintenance Analysis (if applicable).
Book 6, etc., as required, shall contain the L. H. RAS's.

Each book shall contain a maximum of 200 pages. All pages within each book shall be numbered in numerical order. Each book shall contain a change log, a change page index, and an index of the functions and titles contained in each book (see Figure 2, 3, and 4, respectively). These indices pages shall be numbered i, ii, iii, etc.

3.3.2 Processing of Data

Contributors shall send new or changed data to the Function Integrating Contractor. After acceptance of the data, the FIC shall process a change package for each book affected. The change package shall be sent to the contributors, associates, OSI and the MPI Contractor. The MPI Contractor shall insure compatibility of segment-to-segment interfaces. Periodic meetings (frequency dependent on data density) shall be held between OSI and the MPI Contractor to review FIC data. Approved data shall be delivered to the OSI, using normal 1423 delivery procedures.

FORM 804-024 (3-68)

INTEGRATED TECHNICAL REQUIREMENTS BASELINE DATA PACKAGE
CHANGE LOG
NEW ISSUE 1 DEC 67

STD 207_____ BOOK_____

ITRBDP CHANGE	CHANGE DATE	REPLACE PAGES	ADD PAGES
1	3-20-68	i, ii, iii, 9, 15, and 30	15.01, 15.02, & 30.01

INDEX

PAGE	REV & DATE	PAGE	REV & DATE	PAGE	REV & DATE	PAGE	REV & DATE	PAGE	REV & DATE
i	A 3-20-8	22							
ii	A 3-20-8	23							
iii	A 3-20-8	24							
1		25							
2		26							
3		27							
4		28							
5		29							
7		30	A 3-20-8						
8	A 3-20-8	30.01	A 3-20-8						
9		31							
10		32							
11		etc.							
12									
13									
14									
15	A 3-20-8								
15.01	A 3-20-8								
15.02	A 3-20-8								
16									
17									
18									
19									
20									
21									
22									

TITLE

Book 7 | PAGE

FIGURE 3 CHANGE PAGE INDEX

BOOK NO. 207-04 Book 7		DATA TYPE RAS
FUNCTION NO.	TITLE	REVISION
4.8	Perform Extravehicular Experiment	
4.8.1	Prepare for Extravehicular Experiment	A
4.8.1.1	Checkout Pressure Suit	
4,8.1.2	Don Pressure Suit	A
4.8.1.3	Energize Services	
4.8.1.3.1	Check O_2 Supply	
4.8.1.3.2	Check Communications	A
etc.		

DORIAN STD shall be given handling and distribution priority over non-DORIAN STD.

DORIAN security requirements shall be strictly observed. In the event of conflict between requirements of this Exhibit, particularly with respect to data handling and distribution, and DORIAN security requirements, the DORIAN procedures shall take precedence. Unresolvable conflicts shall be reported to the MOL Program Office for resolution.

3.3.3 Change Control of Data

Changes shall be accomplished by replacement pages contained in a change package. The change package shall contain the data (either new or changed), the change log, the change page index, and the function index. The data shall be one or more pages and may be replacements for existing pages or additional pages numbered in sequence. For example, additional pages to be inserted between two existing pages, i.e., 15 and 16, shall be numbered 15.01, 15.02, etc.

Changed pages within each book shall be noted on the change log as either a replacement page or a new page. Each page shall be controlled with a change page index and changes to a page shall be noted with the latest change letter and date. The latest change letter shall also be shown in parenthesis after the page number. Each function shall be controlled with the function index. The index shall note the latest change to any page within that function.

Changes to data submitted for function or system level integration shall be made only with the approval of the originator.

3.3.4 ECP Data

Proposed changes to requirements contained in the System Technical Documentation related to ECP's shall be distributed to all affected associates and to the MPI Contractor for comment and assessment of interface impact prior to submittal of the formal ECP to the MOL Program Office. Affected associates and the MPI Contractor shall respond to the requesting contractor on the impact of the proposed change. Proposed changes to requirements defined in the System Technical Documentation shall be submitted as part of the formal ECP to the OSI and the MPI Contractor. The ECP will identify the specific STD by document and paragraph reference that will be changed.

The changes to the STD shall be accomplished following approval of the ECP.