- Establish the programmatic and technical agreements and baselines — the "Payload Integration Plan" (PIP)

- Define the interface specifications for those interfaces specified in the PIP — the "Interface Control Document" (ICD)

- Define the data in the PIP annexes necessary to configure STS flight and ground systems to provide the services requested in the PIP
PAYLOAD INTEGRATION PLAN

- PRIMARY DOCUMENT USED IN THE INTEGRATION PROCESS
  - IDENTIFIES ROLES AND RESPONSIBILITIES
  - IDENTIFIES TASKS/WORK TO BE ACCOMPLISHED
  - ESTABLISHES BASELINES, GUIDELINES, AND CONSTRAINTS FOR INTEGRATION AND PLANNING
  - ESTABLISHES SCHEDULE FOR ALL INTEGRATION ACTIVITIES

- NASA PREPARES DRAFT VERSION FOR INITIAL INTEGRATION MEETING USING PAYLOAD INPUTS

- DOCUMENT IS REVIEWED WITH CUSTOMER AND REVISED AS REQUIRED

- FINAL VERSION IS PREPARED BY NASA AND SUBMITTED TO NASA AND CUSTOMER FOR SIGNATURE

- DOCUMENT IS PLACED UNDER CONFIGURATION CONTROL AFTER SIGNATURE
NASAs Best-Effort Statement

LSA Approval Prerequisite to PIP Implementation

Indication of Multiple Launches and Retrieval

Introduction

TPD = To Be Determined but Not An Issue

TBR = Issue To Be Resolved

Preface

Approvals: NASA And User

Date of Issue

STS And User Program Name

Title Sheet

Change Page Effectivity

Date

Description

Change Number

Revision Letter

Revision Record

Pip Content

Design And Development

Payload Shuttle Space
• MANAGEMENT RESPONSIBILITIES
  • DOCUMENT CONTROL
  • JOINT RESPONSIBILITIES
  • STS RESPONSIBILITIES
  • PAYLOAD ORGANIZATION RESPONSIBILITIES

• PAYLOAD DESCRIPTION
  • MODULES
  • TYPES OF PROPULSION OR CONTROL SYSTEM
  • ILLUSTRATION (LAUNCH CONFIGURATION)

• MISSION OPERATIONS
  • PRELIMINARY MISSION SCENARIO
  • ORBITAL REQUIREMENTS AND PAYLOAD CONTROL PARAMETERS
  • OPERATIONAL REQUIREMENTS AND CONSTRAINTS
GROUND ENVIRONMENTAL REQUIREMENTS
- Shock, Vibration, and Acoustic Environments
- Contamination
- Compatibilty

- Electromagnetic Interface/Electromagnetic
- Thermal Environments and Interfaces
- Structural Loads and Deflections

ENVIRONMENTAL ANALYSIS AND INTERFACES
- Orbiter General Purpose Computer Software Services
- Fluid Interfaces
- Telemetry and Data Interfaces
- Command Interfaces
- Electrical Power Interfaces
- Display and Control Interfaces
- Cable Interfaces
- Structural/Mechanical Interfaces

- Payload to STS Interfaces
• INTEGRATION HARDWARE
  • STS-PROVIDED HARDWARE
  • PAYLOAD-PROVIDED HARDWARE

• FLIGHT OPERATIONS
  • FLIGHT DESIGN
  • FLIGHT ACTIVITY PLANNING
  • TRAINING
  • FLIGHT OPERATIONS CONTROL
  • COMMAND AND CONTROL SUPPORT

• LAUNCH AND LANDING SITE SUPPORT
  • PAYLOAD PROCESSING FACILITY
  • HAZARDOUS PROCESSING FACILITY
  • VERTICAL PROCESSION FACILITY
  • PAD OPERATIONS
  • POSTFLIGHT PROCESSING
  • ABORTED FLIGHT
  • TRANSPORTATION OF OVERSIZE PAYLOADS
• ICD-2-19001 SHUTTLE ORBITER/CARGO STANDARD INTERFACES
  • DEFINES ALL STANDARD INTERFACES AVAILABLE
  • CONTROLLED BY LEVEL I

• ICD-A-XXXXX UNIQUE ICD
  • FOR SPECIFIC CARGO ELEMENT
  • SAME NUMBER AS PIP
  • SELECTS REQUIRED INTERFACES FROM ICD-2-19001
  • ESTABLISHES NONSTANDARD INTERFACES
  • STRUCTURE SAME AS ICD-2-19001
CARAGO WEIGHT CHARGEABLE ITEMS
MISSION EVENT TIMES
INDUCED ENVIRONMENTS
SOFTWARE INTERFACES
AVIONICS INTERFACES
ELECTRICAL POWER INTERFACES
ENVIRONMENTAL CONTROL INTERFACES
FLUID INTERFACES
STRUCTURAL INTERFACES
PHYSICAL INTERFACES
DOCUMENTATION
INTRODUCTION

CONTENT
• PIP ANNEXES

• DOCUMENT DATA NECESSARY FOR THE STS ELEMENTS TO CONFIGURE FLIGHT AND GROUND SYSTEMS AND TO IMPLEMENT OTHER INTEGRATION FUNCTIONS AS REQUIRED
  — ANNEX 1 — PAYLOAD DATA PACKAGE
  — ANNEX 2 — FLIGHT PLANNING
  — ANNEX 3 — FLIGHT OPERATIONS SUPPORT
  — ANNEX 4 — COMMAND AND DATA
  — ANNEX 5 — POCC REQUIREMENTS
  — ANNEX 6 — CREW COMPARTMENT
  — ANNEX 7 — TRAINING
  — ANNEX 8 — LAUNCH SITE SUPPORT PLAN
  — ANNEX 9 — INTERFACE VERIFICATION
  — ANNEX 11 — EXTRAVEHICULAR ACTIVITY

• NASA HAS A PREPARED FORMAT AND MAINTAINS A SET OF STANDARD DOCUMENTS

• CUSTOMER IS REQUIRED TO PROVIDE DATA VIA ANNEXES

• WORKING GROUP SESSIONS MAY BE REQUIRED TO RESOLVE ANY ISSUES

• DOCUMENT WILL BE BASELINED AND PLACED UNDER CONFIGURATION CONTROL AFTER SIGNATURE BY THE CUSTOMER AND NASA
AGREEMENT

EXCEPT AS STATED IN THE LAUNCH SERVICE

JOINTLY APPROVED BY THE CUSTOMER AND NASA

CONSIDERED BINDING ON NASA FOR IMPLEMENTATION

NOT WITHIN SCOPE OF THE PIP WILL NOT BE

REQUIREMENTS SUBMITTED IN AN ANNEX THAT ARE

WITH ANNEXES

PIP SHALL TAKE PRECEDENCE IN EVENT OF ANY VARIATION

UPDATES MADE AS NECESSARY

DATA SUPPLIED AND VERIFIED BY CUSTOMER

SINGLE AUTHORITY SOURCE FOR PAYLOAD DATA

ANNEXES

S-B-4-04039

NASA

DESIGN AND DEVELOPMENT

PAYLOAD

SHUTTLE

SPACE
PART PURPOSE

- SPECIFY PAYLOAD MASS PROPERTIES
- PREPARE CONFIGURATION DRAWINGS
- PROVIDE RADIO FREQUENCY (RF) RADIATION DATA
- IDENTIFY PAYLOAD PHYSICAL FUNCTION DATA
## Payload Mass Properties

### Elements

**Syncom IV Spacecraft**

**Syncom IV Cradle**

### Table

<table>
<thead>
<tr>
<th>Configuration (As Applicable)</th>
<th>Payload Element</th>
<th>Control Weight</th>
<th>Weight</th>
<th>WT Breakdown Percent</th>
<th>Center of Gravity</th>
<th>Moments of Inertia Slug-FT²</th>
<th>Products of Inertia Slug-FT²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Launch</strong></td>
<td>Cradle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spacecraft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Combined Cradle &amp; SC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Checkout</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Deployment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Return</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PAYLOAD STATIC/DYNAMIC ENVELOPE

DRAG-ON CABLES

HANDLING DEVICES

SPACECRAFT

CRADLE

PAYLOAD ELEMENTS & STS INTERFACES

PAYLOAD ACCESS/REMOVAL ENVELOPES

UHF RECIEVE ANTENNA (STOWED)

UHF TRANSMIT ANTENNA (STOWED)

OMNI ANTENNA (STOWED)

SHF HORN

ORBITER COORDINATES
PAYLOAD COORDINATES

MASS PROPERTIES COORDINATE SYSTEM

ANTENNAS & LOCATIONS

UNRESTRAINED ACCESS
PAYLOAD PHYSICAL FUNCTION DATA

- STS RETRIEVAL
  - SPECIAL HANDLING BY PAYLOAD DEPLOYMENT AND RETRIEVAL SYSTEMS (PDRS)

- OPERATIONS IN CARGO BAY

- CREW SIMULATION/TRAINING

- STS POSTDEPLOYMENT OPERATIONS

- PAYLOAD RETRIEVAL
  - RF & OPTICAL SIGNATURES
  - MARKINGS/PAINT PATTERNS
  - TRACKING AIDS
  - ATTITUDE DATA
  - PDRS TRANSLATION REQUIREMENTS
  - PLUME IMPINGEMENT CONSTRAINTS
  - PAYLOAD ELEVATION MECH DATA
  - TIME HISTORY PAYLOAD FUNCTIONS

- PAYLOAD DEPLOYMENT
  - PDRS TRANSLATION REQUIREMENTS
  - PAYLOAD ELEVATION MECH DATA
  - SEPARATION MECH FORCES
  - PAYLOAD SPIN MECH DETAILED DATA
  - SPECIAL DEVICES DETAILED DATA
  - ORBITER ATTITUDE INITIALIZATION
  - TIME HISTORY PAYLOAD FUNCTIONS

- FREE-FLYING PAYLOADS
  - PAYLOAD TRANSLATION REQUIREMENTS
  - ISP & THRUST TIME HISTORY

- UNIQUE FUNCTIONS REQUIRING CREW TRAINING IN A SIMULATOR
• PURPOSE

• PART I — FLIGHT DESIGN
  — DEFINE PAYLOAD REQUIREMENTS ON STS FLIGHT DESIGN
    • LAUNCH WINDOW AND ORBITAL PARAMETER DATA
    • ELECTRICAL POWER CHARACTERISTICS DATA
    • COOLING LOADS DATA
    • DEPLOYMENT/RETRIEVAL/PROXIMITY OPERATIONS

• PART II — FLIGHT ACTIVITY PLANNING
  — DEFINE FLIGHT ACTIVITY REQUIREMENTS
    • CREW ACTIVITY REQUIREMENTS
    • ATTITUDE AND POINTING REQUIREMENTS
    • CONTAMINATION AVOIDANCE
    • PHOTO/TV REQUIREMENTS
    • EVA SCHEDULE
# TABLE I. LAUNCH/INJECTION WINDOW REQUIREMENTS

## (a) LAUNCH INTERVAL PERIOD

<table>
<thead>
<tr>
<th>BEGINNING</th>
<th>ENDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAY, MONTH, YEAR</td>
<td>DAY, MONTH, YEAR</td>
</tr>
</tbody>
</table>

## (b) CONTINUOUS LAUNCH SEGMENTS DURING LAUNCH INTERVAL

<table>
<thead>
<tr>
<th>SEGMENT ID</th>
<th>BEGINNING</th>
<th>ENDING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MONTH, DAY, YEAR</td>
<td>MONTH, DAY, YEAR</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## (c) FIRST STAGE IGNITION - ASCENDING WINDOW

<table>
<thead>
<tr>
<th>SEGMENT ID</th>
<th>LAUNCH DATE DAILY WINDOW</th>
<th>PARKING ORBIT RIGHT ASCENSION INERTIAL NODE AT IGNITION, DEG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>OPENING CLOSING</td>
</tr>
</tbody>
</table>

## (d) FIRST STAGE IGNITION - DESCENDING WINDOW

<table>
<thead>
<tr>
<th>SEGMENT ID</th>
<th>PARKING ORBIT RIGHT ASCENSION INERTIAL NODE AT IGNITION, DEG</th>
</tr>
</thead>
</table>

## (e) LAUNCH/INJECTION WINDOW LIGHTING & OCCULTATION REQUIREMENTS
WHERE A SIGNIFICANT CHANGE IN POWER LEVEL OCCURS.

- Flight Event (E.g., launch, time of nth node crossing, etc.
- Show time of each power level change referenced to a

**Remote Manipulator System**
**Payload Data Interlayer**
**Tube Display System**
**AFT Multifunction Cathode Ray**
**Switch Panel**

**List Power-Consuming Orbiter Support Equipment**

- Primary AC (APD only)
- Auxiliary BUS B (dc)

*Specify payload timelines for kW's required* (Table II)

**Electrical Power Requirements**

**Design and Development**

NSA
### TABLE IV. PAYLOAD THERMAL REQUIREMENTS

<table>
<thead>
<tr>
<th>PHASE TIME REFERENCE EVENT</th>
<th>PHASE TIME HR:MIN</th>
<th>THERMAL LOAD BTU/HR STS INTERFACE 1</th>
<th>THERMAL LOAD BTU/HR STS INTERFACE 2</th>
<th>THERMAL LOAD, BTU/HR CABIN/LAB ATMOSPHERE</th>
</tr>
</thead>
</table>

Generally parallels the power profile.
### Table V. Payload Operations Sequence

<table>
<thead>
<tr>
<th>Phase</th>
<th>Event Phase</th>
<th>Event Phase</th>
<th>Event Phase</th>
<th>Event Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payload</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payload</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deployment/Retrieval</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Deployment/Activation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-Deployment/Retrieval</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Launch</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Checkout & Activation**

**Payload Sequence of Events (Part II)**

---

**Additional Details on Constraints Identified in Main**

- Body of PIP also go in this part.
- Additional constraints must be completed during mission.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
- See payload ops support requirement.
ANNEX 3 — DATA REQUIREMENTS FOR FLIGHT OPERATIONS

• PURPOSE
  • IDENTIFY PAYLOAD OPERATIONS SUPPORT PLANS
  • DEFINE FLIGHT OPERATIONS DECISIONS
  • DEFINE JOINT OPERATIONS INTERFACE PROCEDURES
  • DEFINE PAYLOAD OPERATIONS PROCEDURES
  • DEFINE PAYLOAD MALFUNCTIONS PROCEDURES
  • PAYLOAD ELECTRICAL POWER AND COMMAND INTERFACE DRAWINGS
### TABLE 3-1. FLIGHT OPERATIONS DECISIONS (3.0)

<table>
<thead>
<tr>
<th>NO.</th>
<th>OPERATIONS DECISIONS</th>
<th>CRIT</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DECISIONS THAT NEED PREFLIGHT CONSIDERATION</td>
<td></td>
<td>• JUSTIFY/CLARIFY DECISION</td>
</tr>
<tr>
<td></td>
<td>EXAMPLES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ALTERNATE/BACKUP MISSION PLAN IMPLEMENTATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• MANAGEMENT OF OFF-NOMINAL CONDITIONS/OPERATIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• GO/NO-GO CRITERIA FOR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• LAUNCH</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• DEPLOY</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• RETRIEVAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• OPERATIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CREW SAFETY = 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>STS VEHICLE INTEGRITY = 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRIMARY PAYLOAD OBJECTIVE = 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**USED TO DEVELOP STS FLIGHT RULES & FLIGHT DATA FILE**
<table>
<thead>
<tr>
<th>STEP (NO.)</th>
<th>OPERATION</th>
<th>DSM</th>
<th>SPEC/ITEM</th>
<th>PANEL/SW</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FUNCTION PERFORMED AT EACH STEP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DIGITAL UPLINK SELECT MATRIX (DSM) NUMBER TO PERFORM FUNCTION (JSC DEFINES OR SUPPLIES BLOCK OF DSM'S)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AFD PANEL &amp; SWITCH TO PERFORM FUNCTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ANY CONSTRAINT OR VERIFICATION REQUIREMENT OR HELPFUL DATA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CREW DISPLAY NUMBER &amp; CORRESPONDING COMMAND TO PERFORM FUNCTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PROCEDURES APPLICABLE ONLY TO COMMANDER-PILOT-MS-JSC/POCC (PAYLOAD-PS-REMOTE POCC PROCEDURES SUBMITTED FOR STS INFORMATION ONLY)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>USED TO DEVELOP STS PAYLOAD SYSTEM OPERATING PROCEDURES (PSOP) (WHICH SUPPORT THE FLIGHT RULES &amp; FLIGHT DATA FILES)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 4-II. PAYLOAD MALFUNCTION PROCEDURES (4.0)

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROCEDURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• CUE THAT ALERTS FLIGHTS CREW OF OFF-NOMINAL CONDITION</td>
<td></td>
</tr>
<tr>
<td>• STEP-BY-STEP LISTING</td>
<td></td>
</tr>
<tr>
<td>• TO GAIN CONTROL</td>
<td></td>
</tr>
<tr>
<td>• DETERMINE SOURCE/NATURE OF PROBLEM</td>
<td></td>
</tr>
<tr>
<td>• ESTABLISH ALTERNATE OPERATIONS</td>
<td></td>
</tr>
</tbody>
</table>

- **APPLICABLE ONLY TO EXTENT THAT STS RESPONSE IS REQUIRED**

- **EXPLAIN AND QUALIFY SO CREW CAN USE JUDGMENT IN ACTUAL CASE & UNDERSTAND URGENCY/RELATIVE IMPORTANCE**

- **FLOW CHARTS SHOULD ALSO BE PROVIDED, SYMPTOM TO CONCLUSION**
**TABLE 5.1 DATA COLLECTION REQUIREMENTS/CONSTRAINTS (5.0)**

<table>
<thead>
<tr>
<th>EVENT</th>
<th>PAYLOAD DATA TYPE &amp; SOURCE</th>
<th>CORRELATIVE SUPPORTING DATA</th>
<th>DATA COLLECTION CONSTRAINTS</th>
<th>DATA CRITICALITY</th>
<th>ONBOARD RECORDING</th>
<th>DATA CROSS-CORRELATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- USED TO DEVELOP MISSION CONTROL CENTER (MCC) DATA ACQUISITION & RECORDER FILL-AND-DUMP PLANS
- KEY TO EVENT SEQUENCE OF FLIGHT PLANNING ANNEX
PURPOSE

- IDENTIFY INDIVIDUAL COMMANDS TO OPERATE THE PAYLOAD
- IDENTIFY MEASUREMENTS FOR STATUS AND HEALTH OF PAYLOAD
- IDENTIFY MEASUREMENTS FOR OBJECTIVE ACCOMPLISHMENT
- PROVIDE NECESSARY INFORMATION PROCESS AND INTERPRETATION DATA
<table>
<thead>
<tr>
<th>Table 10b</th>
<th>Table 10a</th>
<th>Table 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>TABLE 10b</td>
<td>TABLE 10a</td>
<td>TABLE 9</td>
</tr>
<tr>
<td>TABLE 8c</td>
<td>TABLE 8b</td>
<td>TABLE 8a</td>
</tr>
<tr>
<td>TABLE 7c</td>
<td>TABLE 7b</td>
<td>TABLE 7a</td>
</tr>
<tr>
<td>TABLE 6b</td>
<td>TABLE 6a</td>
<td>TABLE 5b</td>
</tr>
<tr>
<td>TABLE 5a</td>
<td>TABLE 5</td>
<td>TABLE 4</td>
</tr>
<tr>
<td>TABLE 4</td>
<td>TABLE 3</td>
<td>TABLE 2</td>
</tr>
<tr>
<td>TABLE 1</td>
<td>TABLE 1</td>
<td>TABLE 1</td>
</tr>
</tbody>
</table>

Specificed by Payload User in Following Tables of Appendix A

Payload Data Requirements

VNSA

Design and Development
## DATA/TABLE USE MATRIX

### REQUIRED BY PAYLOAD SUPPLIER

<table>
<thead>
<tr>
<th>DATA TO BE TELEMETERED TO GROUND:</th>
<th>APPLICABLE TABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENCRYPTED DATA OR BLOCK MODE</td>
<td>1 2 3 4 5A 5B 6A 6B 7A 7B 7C 8A 8B 8C 9 10A 10B</td>
</tr>
<tr>
<td>DATA TO BE PROCESSED BY JSC (MCC OR POCC) OR KSC</td>
<td>X X</td>
</tr>
<tr>
<td>DATA TO BE DISPLAYED ONBOARD ORBITER</td>
<td>X X</td>
</tr>
<tr>
<td>GROUND CALIBRATION</td>
<td>X</td>
</tr>
<tr>
<td>GROUND UPLINK COMMANDS</td>
<td>X X X X</td>
</tr>
<tr>
<td>ONBOARD CCS DIGITAL COMMANDS</td>
<td>X X</td>
</tr>
<tr>
<td>ONBOARD CCS ANALOG/ DISCRETE COMMANDS</td>
<td>X X</td>
</tr>
<tr>
<td>FAULT DETECTION &amp; ANNUNCIATION</td>
<td>X X X</td>
</tr>
<tr>
<td>FLEX MDM (OR EQUIVALENT)</td>
<td>X X</td>
</tr>
<tr>
<td>SPECIAL GPC PROCESSING</td>
<td>X X</td>
</tr>
</tbody>
</table>

---

**Note:** The table above outlines the data and tables required by the payload supplier for various applications, including encrypted data, processed data by JSC, onboard display, ground calibration, ground uplink commands, onboard digital commands, onboard analog/discrete commands, fault detection and annunciation, flex MDM, and special GPC processing. The columns indicate the applicability across different tables.
Annex 5 — Data Requirements for the Payload Operation Control Center (POCC)

Design and Development
PURPOSE

- DESCRIBE PAYLOAD-SUPPLIED EQUIPMENT STOWED OR INSTALLED IN THE CREW COMPARTMENT
- DEFINE REQUIREMENTS AFFECTING STOWAGE, INSTALLATION, HANDLING, OR FLIGHT CREW USE
- DEFINE PROPOSED STOWAGE/INSTALLATION
PREPARE PAYLOAD TRAINING SCHEDULES
ESTABLISH TRAINING SEQUENCE FLOW
DETERMINE INTEGRATED SIMULATION REQUIREMENTS
IDENTIFY POOC TEAM TRAINING REQUIREMENTS
IDENTIFY USER-PROVIDED TRAINING OF STS PERSONNEL

ANNEX 7 - TRAINING

DESIGN AND DEVELOPMENT
ANNEX 8 — LAUNCH SITE SUPPORT PLAN

● PURPOSE

● DEFINE PAYLOAD PROCESSING FLOW

● DEFINE USER LAUNCH AND LANDING REQUIREMENTS/KSC COMMITMENTS

● KSC REQUIREMENTS TO FULFILL COMMITMENTS

● FORMAT

● KSC PREPARES DOCUMENT BASED ON PAYLOAD INPUTS VIA THE GROUND OPERATIONS WORKING GROUP AND SUBMITTAL BY THE CUSTOMER ON SUPPORT REQUIREMENT DATA SHEETS
IDENTIFY LOCATION OF VERIFICATION
IDENTIFY RESPONSIBLE PARTICIPANTS
IDENTIFY METHOD OF VERIFICATION
IDENTIFY PAYLOAD-TO-STIS ICD INTERFACES TO BE VERIFIED
AGREEMENTS
IDENTIFY PROJECT LEVEL INTERFACE VERIFICATION

PURPOSE

ANNEX 9 - PAYLOAD INTERFACE VERIFICATION SUMMARY

VNS

DESIGN AND DEVELOPMENT

SPACE SHUTTLE PAYLOAD
PURPOSE

- DEFINE SPECIFIC DESIGN CONFIGURATION DETAILS FOR EACH HARDWARE-TO-HARDWARE INTERFACE ASSOCIATED WITH THE EXTRAVEHICULAR ACTIVITIES (EVA) SUPPORT OF A PARTICULAR PAYLOAD
  - PLANNED EVA
  - UNSCHEDULED EVA
  - CONTINGENCY EVA
CUSTOMER
DIRECT INTERFACE WITH THE STS IS REQUIRED OF THE
DOCUMENTATION IS MATURER AND IN PLACE. MINIMUM

DOCUMENTATION
DOCUMENTATION REQUIRES LITTLE IF ANY NEW
CARRIER HAVING GENERIC STS INTEGRATION
REPEAT CUSTOMERS OR CUSTOMERS WHO UTILIZE A

ANNEXES
ANNEXES REQUIRED TO GENERATE BASELINE
INTERATION REQUIRED TO GENERATE BASELINE
ANNEX PREPARATION REDUCES MISUNDERSTANDINGS AND
DIRECT INTERFACE WITH PIP ANNEX MANAGER DURING

TO OBTAIN INFORMATION REQUIRED TO GENERATE PIP
PAYLOAD INTEGRATION MANAGER WILL VISIT CUSTOMER

INTEGRATION PLAN (PIP)
EFFORT TO GENERATE BASELINE PAYLOAD
EARLY CONTACT WITH CUSTOMER PROVIDES FOR MINIMUM

SUMMARY
DESIGN AND DEVELOPMENT

VSNA
### Generic Integration Schedule

**Integration Reviews**
- SAFETY REVIEWS (PAYLOAD)
- MISSION FREEZE POINTS

**Documentation**
- PIP (L-36)
- ICD (L-30)
- ANNEX 1
  - PAYLOAD DATA
  - MECSLSI
  - MESELSI
  - CCCD
  - RFI/EMI ANALYSIS
  - CG ANALYSIS
- ANNEX 2
  - FLIGHT PLANNING
  - CREW ACTIVITY PLAN
  - CONCEPTUAL FLIGHT PROFILE
  - CONSUMABLES ANALYSIS
  - SUPER TAPE
- ANNEX 3
  - FLIGHT OPERATION SUPPORT
  - CREW PROCEDURES
  - MISSION RULES
  - MCC OPERATING PHILOSOPHY

**Timeline**
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**Phases**
- PHASE 0 (DESIGN CONCEPT)
- PHASE I (PDR)
- PHASE II (CDR)
- PHASE III (DELIVERY)

**Events**
- CIRD
- CIR
- FOR
- FRR

**Additional Notes**
- FLIGHT DESIGN
- STS HARDWARE/SOFTWARE
- CREW ACTIVITIES/STOWAGE
- LAUNCH SITE FLOW
- LPS/SMS/MCC S/W REL.