Spacecraft A

Safety Data Package

April 1, 20XX

Spacecraft A project

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| --- | --- | --- | --- |
| Revision | Date of enactment | Approval | Reason for revision/change |
| NC |  |  | - |
| A |  |  |  |
| B |  |  |  |
| C |  |  |  |
| D |  |  |  |

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**Attachment-1: Hazard Reports**

**Attachment-2: Safety Verification Tracking Log (SVTL)**

**Attachment-3: Non-Compliance Report (NCR)**

# **1. General**

## **1.1. Purpose**

This document describes the results of the Phase X system safety evaluation of spacecraft A as a data package based on the “Launch Vehicle Payload Safety Standard”.

## **1.2. Scope**

This document is applicable to spacecraft A from arrival to the Kagoshima Space Center (KSC) to the launch site operations, through launch and up to the spacecraft separation from the launch vehicle.

# **2. Related documents**

## **2.1. Applicable documents**

1. Launch Vehicle Payload Safety Standard (JMR-002E)
2. Safety Regulation for Launch Site Operation (JERG-1-007F)
3. Launch Vehicle Payload System Safety Program Plan/Safety Data Package Template (CZA-2018029F)

# **3. Description of the payload/GSE**

## **3.1. Basic information on spacecraft A**

Table XX shows the main specifications of spacecraft A system.

Table XX Spacecraft A main specifications

|  |  |
| --- | --- |
| Launch date | 20XX |
| Design life | X years |
| Launch vehicle | H3 launch vehicle |
| Operating orbit | Sun-synchronous orbit  Altitude 630 km  Inclination 98° |
| Dimensions at launch | XXXX mm × XXXX mm × XXXX mm |
| Launch mass | 3000 kg (Wet) |
| Paddle generating power | X kW |
| Bus equipment | Battery: 1 unit  : Lithium-Ion Cells XXX Ah (X parallel, X series)  Solar array paddle: 2 wings  : Retention and release mechanism: pyrotechnics  Ka-band antenna: 1 unit  : Drive mechanism: NEA (Pin Puller)  S-band antenna: 1 unit  Hydrazine mono-propellant thrusters (XX N): X units  Propellant tank: 1 unit (filled with XXX kg of hydrazine)  Heat pipe: 1unit |
| Mission equipment | X-band antenna: 1 unit  : Retention and release mechanism: NEA (Split spool device) |

## **3.2. Overview of design and function of spacecraft A**

Figure XX shows a block diagram of spacecraft A system configuration, Figure XX and XX show the appearance of spacecraft A at launch and during in-orbit operations.

*(Note: For series payload/re-flight payload, describe the difference from the baseline payload and the impact assessment on the hazard analysis.)*



Figure XX System configuration block diagram



Figure XX External view of spacecraft A (launch configuration)

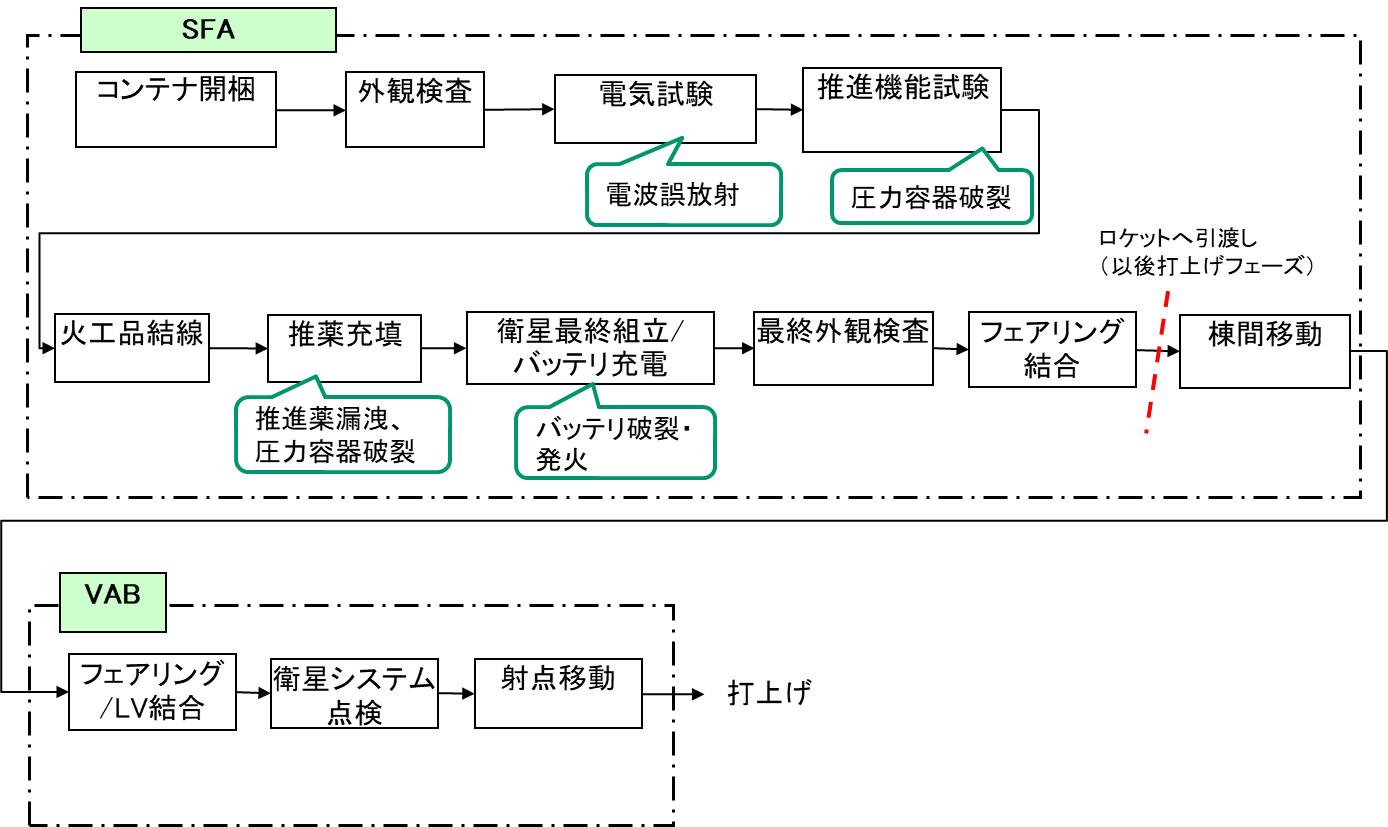


Figure XX External view of spacecraft A (on-orbit configuration)

## **3.3. Flowchart of the launch site operation and description of each task**

The Launch site operations flow of spacecraft A for each building (STA, SFA, and VAB) is shown in Figure XX.

*(Note: Related hazards are described in the operations flow. And the point at which the payload is handed over to the launch vehicle is described.)*



**爆発性危険雰囲気内の発火**

Figure XX Launch site operations flow (callouts indicate typical hazards)

*(Note: For series payload/re-flight payload, describe the difference from the baseline payload and the impact assessment on the hazard analysis.)*

# **4. Hazard analysis result**

## **4.1. Hazard identification summary/4.2. Hazard analysis table/4.3. FTA, etc.**

As results of hazard identification, no hazard was identified other than those described in hazard report templates (the templates of STD-HRs) which are included in CZA-2018029 (Section 2.1 AD (3)). Hazard identification summary, hazard analysis table, FTA, etc. are not attached in this document because the hazard analysis for spacecraft A is performed by using the hazard report templates in CZA-2018029 (Section 2.1 AD (3)).

*(Note: If hazards are anticipated other than those described in hazard report templates which are included in CZA-2018029 (Section 2.1 AD (3)), a hazard identification summary, hazard analysis table, FTA, etc. should be attached to that extent.)*

## **4.4. Hazard report**

Hazard reports prepared using the hazard report templates in CZA-2018029 (Section 2.1 AD (3)) are shown in Attachment-1.

*(Note: If hazards are identified other than those described in hazard report templates which are included in CZA-2018029 (Section 2.1 AD (3)), hazard reports for those hazards should be added in Attachment-1 to that extent.)*

*Notes on using Attachment-1*

1. *If safety verification is incomplete, write “OPEN” in the “Status” column. If it is complete, write “CLOSED.” For items for which the "Status" of safety verification has been set to CLOSED, provide a summary of the verification results in the "Verification Results" column and the name and document number of the document showing the verification results in the "Document Name/Number" column. For items which are required for safety review, provide supplementary information in the attachments of each hazard report format.*

*- Example of a verification result statement:*

*“Verified through drawings and procedures that the two-failure tolerant design (two addressed by design and one addressed by operation) was appropriate.”*

1. *"Status", "Verification Results" and "Document Name/Number" of the safety verification are written in the relevant review phase, with the updated items identified in red or bold type, etc. For example, in the safety review documents of Phase III, the items that have been CLOSED in Phase III are indicated in red or bold to distinguish them from the items that have been CLOSED in Phase II.*
2. *In Phase III safety review documents, items for which verification can be completed only after delivery to the launch site can be described as "CLOSE to SVTL" in "Status" column and the remaining items for verification are described in SVTL in Section 4.6.*
3. *For series payload/re-flight payload, identify the safety verification items of the baseline payload that are to be re-verified and the new items that need to be verified.)*
4. *“Hazards”, “Hazard causes” and “Hazard control methods” have been identified and established based on previous safety review experience, and changes by the user are not permitted in principle. For “Safety verification methods”, if there are appropriate alternatives to the methods described, changes may be made with the agreement of the SSRP secretariat.*
5. *If a hazard report or hazard cause is identified as N/A, delete the entries in the columns to the right of “Hazard control methods” and submit the form with those columns left blank.*
6. *If there are two subsystems subject to hazard reports, prepare two Hazard reports. (Example: If there are high-pressure gas tanks containing hydrazine and xenon, prepare HR-5.2a and 5.2b.)*

## **4.5. Compliance Assessment of Safety Measures required based on the results of Launch Vehicle Hazard Analysis**

N/A (Compliance assessment results have been submitted to the launch service provider).

*(Note: This assessment is submitted directly to the launch service provider.)*

## **4.6. Safety Verification Tracking Log (SVTL)**

The identified Safety Verification Tracking Log (SVTL) is shown in Attachment-2.

*(Note: For Phase III, SVTL is attached if necessary. Use Format-4 of JMR-002.)*

## **4.7. Non-Compliance Report (NCR)**

The identified Non-Compliance Report (NCR) is shown in Attachment-3.

*(Note: NCR is attached in case of noncompliance to requirements. Use Format-6 of JMR-002.)*

# **5. JMR-002 Chapter 6 Compliance Assessment Results**

## **5.1. Design outline of depressurization port, propellant and oxidizer discharge port in case of leakage**

Figure XX shows an overview of the design of the depressurization port and the propellant and oxidizer discharge port in case of leakage on spacecraft A.

Figure XX Overview of the design of the depressurization port and the propellant

and oxidizer discharge port in case of leakage

## **5.2 Explanation of operational policy for depressurization and discharge of propellant, oxidizer in case of leakage**

**5.2.1. policy in the event of a leak during payload launch site operations**

If propellant or oxidizer leaks in SFA during payload launch site operations, first evacuate all persons and then set entry restrictions for SFA. Then, personnel enter the leaking area with a scape suit and connect a GSE for depressurization to the port to depressurize. After the depressurization is complete, the personnel connect the GSE to the propellant or oxidizer discharge port and collect the propellant or oxidizer. After the recovery of propellant, oxidizer is completed, detoxify the leaked propellant, oxidizer at the site, and when the concentration of propellant, oxidizer at the leaked location drops below the regulated value, the entry restrictions on SFA are lifted.

**5.2.2. policy in the event of a leak after handling over to the launch vehicle**

If propellant or oxidizer leaks during joint operations with the launch vehicle in the VAB, depressurization and propellant or oxidizer discharge operations will be performed according to the launch vehicle's instructions.

*(Note: If those operations obey the launch vehicle's instructions, state that fact here.)*

**Attachment-1:**

**Hazard Reports**

**Attachment-2:**

**Safety Verification Tracking Log (SVTL)**

**Attachment-3:**

**Non-Compliance Report (NCR)**