Spacecraft A

System Safety Program Plan

April 1, 20XX

Spacecraft A Project

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

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# **1. General**

## **1.1 Purpose**

This system safety program plan prescribes a program plan to be implemented to prevent accidents that may occur at each phase from the arrival of the spacecraft A to the Kagoshima Space Center (KSC) to the separation of the payload from launch vehicle after launch from the KSC, to protect human life, properties, and environment from accidents caused by the development of the payload.

## **1.2 Scope**

This document applies to the system safety activities to be performed by the spacecraft A project for the above purposes with respect to the design, manufacturing and launch site operations of the spacecraft A. In the case that the operation is to be performed in the premises of JAXA other than the KSC, the operation is subject to local safety requirements, etc.

# **2. Related documents**

## **Applicable documents**

1. Launch Vehicle Payload Safety Standard (JMR-002E)
2. Safety Regulation for Launch Site Operation (JERG-1-007F)
3. Guidelines for Preparation of System Safety Review Documents for Launch Vehicle Payloads (CZA-2021006 D)
4. Launch Vehicle Payload System Safety Program Plan/Safety Data Package Template (CZA-2018029F)

# **3. Implementation items**

## **3.1 Organization and implementation system**

The scope of responsibility is as follows:

(1) The scope of responsibility for system safety activities

The spacecraft A project promotes and ensures system safety in the design/ fabrication, etc. of the spacecraft A in accordance with the applicable documents.

In addition, the spacecraft A project coordinates with the JAXA Safety and Mission Assurance Department regarding the data required for the safety review, submits the data, and undergoes the JAXA System Safety Review.

Figure 3.1-1 shows a chart of the system safety management organization.

(2) Implementation of system safety activities

The spacecraft A project perform hazard analysis (hazard identification, risk assessment, hazard analysis in each phase, preparation of hazard reports, and safety verification) of the launch site operations (from the arrival of the launch site to handing over to the launch vehicle) in accordance with the applicable document 2.1 (1) section 4.3 and 2.1 (4). For the launch phase (from handing over to the launch vehicle to payload separation), hazard control and safety verification of the payload are established in accordance with the applicable document 2.1(3). The document is submitted to the launch vehicle organization.

(3) Application procedures for government agencies

The application procedures for the safety of high-pressure gas equipment for space use are in accordance with the High Pressure Gas Safety Act.

The application procedures for the safety of radio equipment are in accordance with the Radio Act and related regulations.

The application procedures for the safety of pyrotechnic devices are in accordance with the Explosives Control Act, etc.

The application procedures for the management of spacecraft are in accordance with Space Activities Act, etc.

## **3.2 System safety review method**

1. As shown in figure 3.3-1 the spacecraft A project undergo two JAXA System Safety Reviews in Phase 0/I/II and Phase III for the launch site operations (from arrival to the launch site to handing over to the launch vehicle). In the case of a series payload/reflight payload, the treatment of the follow-on payloads should be described (e.g. the follow-on payloads undergo one JAXA System Safety Review in Phase delta II/III)
2. For the launch phase (From handing over to the launch vehicle to payload separation), the spacecraft A project submits the results of the payload hazard control and safety verification to the launch vehicle in accordance with the applicable document 2.1 (3). (The JAXA System Safety Review is to be undergone by the launch vehicle).

## **3.3 System safety activities in each phase of development**

Milestones for system safety program activities are shown in figure 3.3-1.

Safety activities are conducted in each phase and results are subject to the JAXA System Safety Review. If any changes occur after the Phase III safety review, the JAXA System Safety Review is conducted as necessary.

Secretariat

JAXA Safety Review Board

JAXA Safety and Mission Assurance Department

Submission

Secretariat

JAXA System Safety Review Panel

Support for preparation and implementation of system safety program/hazard analysis

Submission

・Development/implementation of a system safety program plan

・Development and compilation of safety data package

Spacecraft A Project

・System Safety Program Manager; XXXXXX

・System Safety Program person in charge; XXXX

Submission of safety data package

・Development/implementation of a system safety program plan

・Implementation of hazard analysis of spacecraft system

・Development of safety data package

B (System manufacturer)

Submission of hazard analysis result of subsystem

・Development/implementation of a system safety program plan

・Implementation of hazard analysis of subsystem

C (subsystem manufacturer)

Figure 3.1-1 System safety management organization

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time(month/year)  Phase  System safety  Program activity | | Conceptual study/  Definition design | | Preliminary Design | Critical Design | Manufacturing/  Verification | | Operation | Remark |
| (Phase 0) | | (Phase I) | (Phase II) | (Phase III) |  | |
| Overall  milestone | Safety review |  |  |  | (X/20XX)  Phase 0/I/II  Safety review | (X/20XX)  Phase III  Safety review | |  |  |
| Development  milestone |  |  | (X/20XX)  Preliminary design review  (PDR)  ▽ | (X/20XX)  Critical design review  (CDR)  ▽ | (X/20XX)  Post qualification review (PQR) or Pre shipment review (PSR)      △Launch (X/20XX) | |  |  |
| System safety program plan | | Preparation | Enactment  ▽ | Implementation  Update/Revision  ▽ | Implementation  Implementation  Update/Revision  ▽ | Update/Revision  ▽ | |  |  |
| Hazard analysis | |  | Phase 0  Hazard analysis | Review  (As necessary) |  |  | |  |  |
|  |  | Phase I  hazard analysis | Review  (As necessary) |  | |  |
|  |  |  | Phase II  Hazard analysis | Review  (As necessary)  Review  (As necessary) | |  |
|  |  |  |  | Phase III  Hazard analysis | |  |
| Safety requirements | | Initial identification of safety requirements  ▽  Identification of safety requirements  ▽ |  | (As necessary)  Add details to requirements/Review  ▽　　　　　　▽ |  |  | |  |  |

Figure 3.3-1 System safety program activities in the life cycle