Guidelines on Type Certification for Launch Vehicles

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Cabinet Office
National Space Policy Secretariat

History of revisions

Edition	Date of establishment	Detail of revisions
First Edition	November 15, 2017	New establishment
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Table of Content

1. Introduction

These Guidelines are intended to provide guidance to the concept of compliance and specific examples related to the review standards on a type certification for launch vehicles as provided in the Review Standards and Standard Period of Time for Process Relating to Procedures under the Act on Launching of Spacecraft, etc. and Control of Spacecraft.

For the development of these Guidelines, domestic and foreign standards (e.g. ISO, IADC Guidelines, FAA standards) were consulted with.

2. Governing documents

For these governing documents, consult with the latest versions as of the time of application.

(1) Act on Launching of Spacecraft, etc. and Control of Spacecraft (Act No. 76 of 2016)

(2) Regulation for Enforcement of the Act on Launching of Spacecraft, etc. and Control of Spacecraft (Cabinet Office Order No. 50 of 2017)

(3) Review Standards and Standard Processing Relating Time to Procedures under the Act on Launching of Spacecraft, etc. and Control of Spacecraft

3. Definitions of terms

Unless otherwise provided, the terms used in these Guidelines have the meanings as defined in the Act and Regulation. The terms and abbreviations as used in these Guidelines have the following meanings:

- Act
  Act on Launching of Spacecraft, etc. and Control of Spacecraft (Act No. 76 of 2016)

- Regulation
  Regulation for Enforcement of the Act on Launching of Spacecraft, etc. and Control of Spacecraft (Cabinet Office Order No. 50 of 2017)

- Review Standards
  Review Standards and Standard Processing Relating to Procedures under the Act on Launching of Spacecraft, etc. and Control of Spacecraft

- Spacecraft
  An artificial object which is used by putting it into Earth orbit or beyond or placed on a celestial body other than the Earth. More concretely, a spacecraft means an earth orbiting spacecraft including an earth observatory satellite and positioning satellite, a geostationary satellite, an explorer navigating in outer space including the area beyond a geostationary orbit, an explorer engaged in activities in the vicinity or on the ground surface or other celestial body (e.g. rover), reentry vehicle and dummy mass.

- Spacecraft, etc.
  A spacecraft and a vehicle for launching a spacecraft

- Launch of a spacecraft, etc.
  Loading a spacecraft onto a launch vehicle, lifting off and accelerating the launch vehicle until it reaches a certain speed and altitude, and separating the spacecraft at that point, using a launch site managed and operated by the person or another person.

- Low earth orbit protected region
  A spherical region that extends from the Earth's surface up to an altitude of 2,000 km

- Geostationary earth orbit protected region
  A region of spherical shell which is defined as follows:
  - Lower altitude = geostationary altitude (approximately 35,786km) minus 200km
  - Upper altitude = geostationary altitude plus 200km
  - -15 degrees ≤ latitude ≤ +15 degrees

- Failure, etc.
  Failure, unexpected activation or erroneous operation

- Failure tolerance
  Capability of ensuring the safety of areas in the vicinity of the trajectory and launch site of the launch vehicle even in case of failure, etc.
  Two-failure tolerance means the capability of ensuring the safety of areas in the

vicinity of the trajectory and launch site in relation to any combination of two failures, etc.

- Expected casualties (*Ec*)
  A probabilistic prediction of number of people that may be seriously affected by contact with falling objects, etc., such as the loss of human life or long-term disability or loss of body function.

- Flight termination measures
  Destruction of a launch vehicle or any other measures to terminate the flight in the case of the deviation of the launch vehicle from the planned trajectory or any other anomalies.

- Flight safety operation
  Measures to be taken until the completion of launch of a spacecraft, etc. so as to minimize the possibility of damage caused to human life or body, or property on the ground, water surface, an aircraft in flight or other flying objects caused by the fall, collision or explosion of a spacecraft, etc. in whole or part, that has not been successfully separated from the launch vehicle and to ensure public safety.

- Radio equipment
  Electrical equipment for transmitting or receiving codes using electromagnetic waves, and a computer connected to the equipment via telecommunication lines

- Impact limit line
  A line defined for ensuring the safety that indicates the boundary limit beyond which a launch vehicle must not cause any harmful effect in cases of termination of flight of the launch vehicle.

- Planned impact area
  A planned impact area of objects to be separated and jettisoned from a launch vehicle in the course of its normal flight, including combustion residue and fairings of a launch vehicle.

- Estimated impact area
  A range affected by hazards caused by a launch vehicle in flight including a flight

in anomalies, including the fall of the body and fragments of the launch vehicle.

- Launch vehicle safety standard
  The standard specified by Article 7 of the Regulation as the safety standard concerning a launch vehicle for ensuring the safety of the vicinity of the trajectory and launch site of the launch vehicle.

- Orbital stage
  A body of a launch vehicle to be put into Earth orbit or beyond.

- Manned spacecraft, etc.
  A space station including an international space station and manned spacecraft.

- IADC
  Inter-Agency Space Debris Coordination Committee

- ISO
  International Organization for Standardization

- FAA
  Federal Aviation Administration

4. Scope of Application

A person who intends to obtain a type certification for launch vehicle may obtain a type certification if the design thereof complies with the launch vehicle safety standard.
The person who intends to obtain a type certification is not required to be the person who intends to implement the launching of spacecraft, etc.

5. Outline of process (from application to grant of permission)

5.1. Application process

An applicant may submit a single application for a type certification for launch vehicle in relation to two or more configurations of a vehicle (e.g. whether the launch vehicle has an auxiliary booster). In this case, if the results of design differ depending on the configurations of vehicles, such as the flight capability, each of these designs needs to conform to the launch vehicle safety standard.

Determine and describe the payload mass, orbit and effect of season of launching considering the anticipated range.

An applicant is recommended to hold a prior discussion with the National Space Policy Secretariat of the Cabinet Office of Japan (hereinafter referred to as the "NSPS") from the preparation phase of the application, so as to avoid any duplicated procedures. Officials of the NSPS may enter the offices, etc. of the applicant and conduct a verification, etc. as deemed necessary for facilitating the review.

5.2. Standard period of time for process

4-6 months

The standard period of time for process is the length of time generally required for processing an application without any defect in the application documents.

An applicant may file an application or seek a prior consultation any time. An applicant is recommended to submit an application allowing for sufficient time before the slated time of using the launch vehicle.

In the case of an application for a type certification for launch vehicle that proved to be appropriate in the past, for example, a launch vehicle which obtained permission relating to launching using the same launch vehicle in the past, it is highly possible that the time required for the review will be accelerated. In order to prepare application documents in an effective way, the applicant is recommended to consult with the NSPS in advance.

6. Type certification for launch vehicles

Article 6 of the Act (Requirements for Permission)

(i) the design of the launch vehicle complies with the standard specified by Cabinet Office Order as the safety standard concerning a launch vehicle for ensuring the safety of the vicinity of the trajectory and launch site of the launch vehicle (hereinafter referred to as a "launch vehicle safety standard"), or the design has obtained a type certification under Article 13, paragraph (1) or a foreign certification;

6.1. Flight capability

Article 7 of the Regulation (Launch Vehicle Safety Standard)

(i) that the launch vehicle has a flight capability which provides the ability for launching of the spacecraft, etc.; Review Standards 1. Flight capability - The launch vehicle is designed so that it has a flight capability sufficient for the launch, and the design has undergone verification.

Establish a flight plan describing the system configuration, proportion of propellants, flight sequence of event, nominal and dispersed trajectories, orbit for spacecraft and flight safety operation, considering the spacecraft to be loaded, trajectory and orbit to be inserted. For the nominal and dispersed trajectories, also indicate the conditions of calculation and data used.
Also indicate that the systems and the necessary sub-systems are appropriately designed and that major factors to explain the flight capability of a launch vehicle have been verified by an analysis, test, etc.

A flight capability of a launch vehicle may receive a critical impact by the following restrictions in light of safety related to the determination of a trajectory. For verifying the flight capability, confirm the feasibility of the flight plan for the contemplated launch vehicle in relation to the actual launch.
For the details of the restriction in light of safety, see the Guidelines on Permission Related to Launching of Spacecraft, etc. (the number in the parenthesis represents the applicable section number).

- Planned impact area for jettisoned objects (6.3.4.1)
- Avoidance of passing over densely populated areas (6.3.4.2)
- Criteria relating to risks that may be caused to lives in the vicinity of the trajectory (6.3.4.2)
- Feasibility of flight safety operation (RF link) (6.3.13, 6.3.14)
- Avoidance of interference of estimated impact area and impact limit line (6.3.14)

For the purpose of the confirmation, errors in performance of the propulsion system, guidance system, attitude control system, etc. of the vehicle and the dispersion due to launch conditions such as winds must be taken into account; however, an assessment based on a worst-case scenario is also acceptable.
Any matters not specified above but may relate to the flight capability also need to

be studied in advance (e.g. possibility of a collision with a manned spacecraft, etc.)

6.2. Safety requirements of ignition device, etc.

Article 7 of the Regulation (Launch Vehicle Safety Standard)

(ii) that measures have been taken to ensure the safety of the vicinity of the trajectory and launch site of the launch vehicle even in the event of a fault, unexpected activation or erroneous operation (hereinafter referred to as "fault, etc.") of an ignition device, etc.;

Review Standards

2. Safety requirement for ignition device, etc.

- Measures are taken to ensure the safety of the vicinity of the trajectory and launch site of the launch vehicle for the case of any combinations of two types of failures, etc. This measure may also include the measures to be taken at the launch site.
- Among the measures taken, two or more measures are always capable of being monitored.
- Necessary measures have been taken to prevent any accidental ignition of pyrotechnic devices caused by stray lightning, etc.
- Measures have been taken to prevent the easy occurrence of failures, etc. caused by the effect of the ambient electromagnetic waves, etc.

6.2.1. Devices which fall under ignition device, etc.

- Systems for igniting liquid propellant rocket and solid propellant rocket
- Flight termination system (a command destruct system and destruction mechanism for inadvertent separation)
- Separation systems (separation systems such as an inter-stage separation system, fairing separation system and an auxiliary booster)

However, the flight termination system and separation system which are considered not to relate to ensuring of the safety of the vicinity of the trajectory and launch site are excluded. In relation to the flight termination system after the lift-off of a launch vehicle, the measures taken under 6.4 and 6.5 may be taken into account.

6.2.2. Two-failure tolerance

Three or more independent measures must be included to satisfy the two-failure tolerance requirement. The status of the two or more measures must be always capable of being monitored. The measures may include a measure taken at the

launch site. Specific examples of the measures are as follows.

- Physical inhibiting using connectors
- Inhibiting of input signals using software
- Measures to prevent valves of liquid propellant rocket from relieving. In cases where, for example, batteries for driving valves and for electric circuit of driving signals are independent, these may be considered as two measures.
- Emergency stop in case of detection of anomalies

In the case of implementing measures using software, describe the plan and results of verification in addition to the explanation of the operation of the software.

If it is inevitable to invalidate such measures for the launch, it is permitted to invalidate the measures immediately before the lift off. However, it is necessary to ensure that the measures can be invalidated only when the soundness thereof is confirmed and it is confirmed that an accident due to the invalidation can be avoided by evacuating people in the surrounding areas. Devise a clear plan for invalidating the measures for the launch, and if the means of confirmation are implemented in the launch vehicle, necessary measures are to be included in the design. In addition, pay consideration such that the measure may be validated and reverted to a safe condition if any problem is found at any time.

As for the measures that are not required to be invalidated before the lift off, including the ignition of the upper stage engine, such measures must be designed so that they will be invalidated immediately before the execution of the relevant event to the possible extent.

6.2.3. Measures to prevent inadvertent ignition of pyrotechnic devices

The following is an example of shielding of pyrotechnic devices:

(1) Electrical firing circuits must be completely shielded or shielded from the initiating ordnance back to a point in the firing circuit at which filters or absorptive devices eliminate RF entry into the shielded portion of the system.
(2) Shielding must provide a minimum of 85 percent of coverage ratio.
(3) There must be no gaps or discontinuities in the termination at the back faces of the connectors.
(4) Shields terminated at a connection must be joined around the full 360 degree circumference of the shield
(5) All metallic parts of the initiating ordnance subsystem that are physically connected must be bonded with a DC resistance of less than 2.5mΩ.

(6) Firing, control, and monitor circuits must all be shielded from each other.
(7) Each circuit must be designed so that the induced power of the firing circuit of the pyrotechnic device by electromagnetic environment is no greater than 20dB below the initiator's firing level.

6.3. Function for flight safety operation

Article 7 of the Regulation (Launch Vehicle Safety Standard)

(iii) that the launch vehicle has a function to transmit signals indicating the position, attitude and condition of the launch vehicle;

Review Standards

3. Function for flight safety operation

- The launch vehicle has a function of transmitting signals indicating its position, attitude and condition.

A launch vehicle must be equipped with functions for receiving and transmitting the following data so as to achieve the flight safety of the launch vehicle.

- Information on the position, attitude and velocity of the launch vehicle
- Information on health check of launch vehicle (a propulsion system and navigation and guidance system)
- Information on the health check of flight termination system (equipment onboard the launch vehicle)

6.4. Functions for flight termination

Article 7 of the Regulation (Launch Vehicle Safety Standard)

(iv) that the launch vehicle has a function to ensure the safety of the vicinity of the trajectory and launch site of the launch vehicle by flight termination measures of the launch vehicle;

Review Standards

4. Flight termination function

- The launch vehicle has a function of receiving signals necessary for implementing the flight termination measures and a function of implementing flight termination, etc. In addition, the assessment on ensuring the safety is conducted according to the specific launch plan to be contemplated in the future, the risk to the vicinity of the trajectory and launch site does not exceed the level stipulated in the

international standards or standards provided by the space agency of each state, and it is possible to prevent the risk of falling outside the impact limit line determined in advance.

- Even in the case of another methods (including the methods, etc. to suspend sequences when signals are not received), the risk to the vicinity of the trajectory and launch site does not exceed the level stipulated in the international standards or standards provided by the space agency of each state, and it is possible to prevent the risk of violating the impact limit line established in advance.

In cases where a flight termination is to be executed by receiving a signal transmitted from the ground, install a command receiver for receiving the signal to the launch vehicle. Install command receivers on all stages, or on the final stage. In the latter case, install equipment for automatic flight termination system in case of inadvertent separation of stages other than the final stage. However, installation on the final stage is not mandatory if the flight termination is not necessary for the entire phase of flight of the final stage.
For the assessment in relation to the ensuring of safety, consider the time required for acquiring information including position of the launch vehicle and delay in computer processing time.

Calculate the expected casualties related to the planned trajectory for launching a launch vehicle and demonstrate that the number does not exceed the criteria of international standard specified in the Conditions for Calculating Number of Expected Casualties and Its Methods (Launch Vehicles) attached to these Guidelines. In the case of ensuring safety by other methods, analyze the effect concerning the ensuring of public safety and take necessary measures.

The assessment corresponding to the actual launch of a launch vehicle must be separately implemented in the process of obtaining permission related to the launching of spacecraft, etc.

The following is the formula for the calculation of expected casualties (*Ec*).

$$E_{C-Total} = \sum_{t} \sum_{j} E_{Ctj}$$

$$E_{Ctj} = P_{Itj} \left(\frac{N_{Pj}}{A_{Pj}} \right) \left(N_{Bt} A_{Ct} \right)$$

P_{Ij}: the probability of a fragment from debris group "i" impacting on population center "j"
A_{Ci}: the effective casualty area for a fragment from debris group "i"
N_{Fi}: the number of fragments in debris group "i"
N_{Pj}: the number of people in of population center "j"
A_{Pj}: the area of the population center "j"

Source: FAA Flight Safety Analysis Handbook ver1.0, September 2011

6.5. Reliability and redundancy of safety-critical systems, etc.

Article 7 of the Regulation (Launch Vehicle Safety Standard)

(v) that, for the important systems, etc. which constitutes the function to ensure the safety of the vicinity of the trajectory and launch site of the launch vehicle, measures have been taken to ensure the reliability and multiplexing (meaning the configuration of two or more systems or devices with the same function on the same system; the same applies hereinafter) sufficient for the system to function even in the event of a fault, etc.;

Review Standards

5. Reliability and redundancy of safety-critical systems, etc.

- For safety-critical systems, etc. which constitute the function to ensure the safety of the vicinity of the trajectory and launch site by flight termination measures of a launch vehicle, the reliability is 0.999 or more at a 95% confidence or an equivalent level, and the systems, etc. are fully redundant so that the they will function even in cases of failure, etc.

6.5.1. Safety critical systems, etc.

Safety critical systems, etc. constituting the functions to ensure the safety of the vicinity of the trajectory and launch site of the launch vehicle relate to the following. However, systems, etc. to be used only for phases in which flight termination is considered unnecessary are excluded.

- In case where a flight termination is executed by way of receiving a signal transmitted from the ground
  - Flight termination system, etc.
    - A system for flight termination, including a system for receiving

commands for flight termination from the ground

- Systems necessary for the decision on whether the flight termination is necessary.
  - A system for acquiring information on position which is a condition for determining the execution of flight termination and a system for transmitting the acquired information on position, etc. to the ground

➢ In case where a flight termination is executed based on the decision made by the airborne system:
- Flight termination system, etc.
  - A system for flight termination

- A system, etc. necessary for the decision on whether the flight termination is necessary.
  - A system, etc. for acquiring and processing information on position which is a condition for determining the execution of flight termination

The term "etc." contained in "system, etc." used in this section means that the means of achievement of the relevant function is a component or parts, not a different system.

6.5.2. Reliability and redundancy

The systems identified in 6.5.1 must be designed so as not to lose safety-related important functions caused by a single failure by ensuring the redundancy for the secure operation of the system, etc.
Also the reliability of the entire system including the redundancy must be assessed if it satisfies the criteria of 0.999 or more in relation to one of the following levels and the evidence of the assessment must be submitted.

(1) Confidence level of 95%: Specific examples of statistically accurate reliability (empirical reliability) are as follows:
- Empirical reliability derived from a number of experiments.
- For purchased materials, reliability with confidence level of 95% as indicated

by the supplier or reliability converted to the value of confidence level of 95% in the case where the supplier indicates the confidence level of other value than 95%.

(2) Equivalent level: Specific examples of reliability (design reliability) that are considered to be equivalent in terms of engineering are as follows:

- Reliability converted to the value of confidence level of 95% from those derived from MIL Handbook (MIL-HDBK-217F Notice 2, DEPARTMENT OF DEFENSE HANDBOOK, Reliability Prediction of Electronic Equipment, 28 February 1995), etc. Each coefficient used for calculation of reliability can be optimized based on the assessment of the validity of the values.
- For purchased materials that are widely distributed in the market, a reliability derived from the number of fault, operational experience, etc. (appropriate margin must be considered if necessary)
- For structure materials, a reliability derived from the distribution of strength of the material with confidence level of 95% and conditions of use, etc.

As an example, the following is the concept of the criteria of reliability and redundancy in cases where a launch vehicle has two or more flight termination means including a command destruct and thrust termination.

- If flight termination measure A can be enabled for the entire phase requiring flight termination, the flight termination measure A satisfies the requirements for the criteria of reliability and redundancy.
- If the launch vehicle has flight termination measures A and B for the phases requiring flight termination, and they can be enabled in the different phases, respectively, both flight termination measures A and B satisfy the requirements for the criteria of reliability and redundancy.

As for transmission of signals related to safety-critical systems, etc., take measures including appropriate encryption so as to prevent interference and takeover.
In addition, electric devices may not exceed the definite period of storage and the counts of use (e.g. counts of discharging and charging of a battery).

6.6. Prevention of the occurrence of orbital debris relating to the separation of spacecraft, etc.

Article 7 of the Regulation (Launch Vehicle Safety Standard)

(vi) that measures have been taken to prevent the release of debris, etc. at the time of the separation of spacecraft, etc. to the possible extent;

Review Standards

6. Mitigation of the generation of orbital debris relating to the separation of spacecraft, etc.

- The launch vehicle is designed so as to prevent the dispersion of fragments, etc. to the possible extent upon the operation of the stage separation system, spacecraft separation system, etc. of the launch vehicle; provided, however, that this does not apply to spacecraft support structures that are unavoidably released upon the launch of two or more spacecraft.

The objects separated and released from a launch vehicle must be designed as follows:

- Fasteners such as bolts used for pyrotechnic devices and clamp bands or their fragments must be configured so as not be released into Earth orbit at the operation of stage separation system or spacecraft separation system.
- For the release of the combustion products of pyrotechnic devices, combustion products larger than 1mm in their largest dimension must not be released into Earth orbit.
- Take the following measures in relation to a solid motor:
  - Measures to avoid releasing solid combustion products in the geostationary earth orbit protected region.
  - Measures considering the prevention of the release of solid combustion products that may contaminate the low earth orbit protected region.

6.7. Restriction of the occurrence of orbital debris relating to the orbital stage

Article 7 of the Regulation (Launch Vehicle Safety Standard)

(vii) that, for a stage to be put into orbit from among the stages constituting the launch vehicle, measures have been taken to prevent the break-up at the time of the separation of spacecraft, etc. to the possible extent.

Review Standards

7. Mitigation of the generation of orbital debris relating to the orbital stage of launch vehicle

- Measures are taken to prevent the unexpected activation of pyrotechnic devices for command destruction of the orbital stage of the launch vehicle.
- In the case of a launch vehicle for which the propellant is liquid fuel, the launch vehicle has a function to vent the remaining propellant, gas, etc. to the possible extent, and measures are taken to install safety valves to avoid the increase of internal pressure so as to avoid break-up even if the venting is not completed.

The following measures must be taken to reduce the generation of orbital debris caused by an orbital stage after separation of spacecraft.

- The function to turn off the receiver as a measure for prevention of unexpected activation of pyrotechnic devices for command destruction on the orbital stage of a launch vehicle must be installed, and sufficient margin for the guaranteed temperature for anti-spontaneous combustion must be ensured considering the temperature increase by solar radiation, etc.
- As for launch vehicles of which propellant is liquid, a function to release residual propellant and residual gas etc. must be equipped to the possible extent, and a measure to prevent break-up even in the case where the exhaustion is not completed, such as installing relief valves to prevent the increase of internal pressure, must be taken. In cases where a power supply is needed to maintain the open status of the exhaust valve, the capacity of a battery must be designed so as to ensure sufficient power supply. In addition, if it is difficult to equip a mechanism for releasing residual liquids in a tank or air container, this function must be guaranteed by structural strength (in case where the pressure is gradually reduced by releasing gas using a bleed valve of a regulator (an exhaust valve that maintains pressure regulating function), it is necessary to guarantee strength for the phase until the decompression is completed).

7. Authorization, etc. to make change

Article 13 of the Act (Type Certification)

(2) A person who intends to obtain a type certification referred to in the preceding paragraph must submit a written application to the Prime Minister, pursuant to the provisions of Cabinet Office Order, specifying the following information, attaching a document certifying that the design of the launch vehicle complies with the launch vehicle safety standard and other documents specified by Cabinet Office

Order.

(i) the person's name and address;

(ii) the design of the launch vehicle; and

(iii) other matters specified by Cabinet Office Order.

Article 14 of the Act (Change of Design, etc.)

(1) When a person who obtained a type certification under paragraph (1) of the preceding Article intends to change any matter set forth in item (ii) of paragraph (2) of that Article (including when a change has been made to the launch vehicle safety standard and the design of the launch vehicle for which the type certification was granted no longer satisfies the launch vehicle safety standard), the person must obtain authorization from the Prime Minister pursuant to the provisions of Cabinet Office Order; provided, however, that this does not apply to minor changes specified by Cabinet Office Order.

(2) When there has been a change to any of the items set forth in Article 13, paragraph (2), item (i) or (iii), or any minor change specified by Cabinet Office Order as referred to in the proviso to the preceding paragraph, the person who obtained a type certification under Article 13, paragraph (1) must make a notification to that effect to the Prime Minister without delay.

If any information stated in the application documents is changed, it is necessary to submit the following application for authorization or notification of change, depending on the items to be changed and the degree of change. Those who cannot determine which of the authorization or notification would be necessary are recommended to consult the NSPS in advance.

7.1. Application for authorization of change

7.1.1. Scope of application for authorization related to change

An operator that intends to make any change relating to Article 13, paragraph (2), items (ii) of the Act is required to submit an application for authorization related to change, except for a change that would not result in any substantial change as indicated in 7.2.

7.1.2. Specific examples for application for authorization related to change

- A change of flight capabilities which is not minor (cases involving changes in the standard performances of engines and the results of simulation based on the orbit

into which a payload is to be injected, etc.)
- A change of measures relating to the safety of ignition device, etc.
- A change of measures for flight termination
- A change of functions, performances, etc. of safety-critical systems

7.2. Notification of change

Article 14 of the Regulation (Application, etc. for Change of Designs, etc.) (3) The minor changes specified by Cabinet Office Order, as referred to in the proviso to Article 14, paragraph (1) of the Act, are changes that would not result in a substantial change in the matters set forth in Article 13, paragraph (2), item (ii) of the Act.

7.2.1. Scope of notification of change

It is necessary to submit a notification of change if any of the following applies:
- If the operator intends to make a change related to Article 13, paragraph (2), item (i) of the Act.
- If the change would not result in any substantial change in relation to item (ii) of that paragraph.

7.2.2. Specific examples for notification of change

- Optimization of flight capability considering the accumulation of data based on the records of launch
- Review of the reliability within the criteria considering the update of reliability data
- Review of information on block diagram, position and instrumentation of equipment within the scope that would not have any impact on the ensuring of public safety
- Replacing an old system with a new one associated with the update of safety-critical systems, etc., for which a prior authorization is obtained by stating both the new and old systems.
- Replacement of parts, etc. used for a purpose other than safety-critical systems, etc. to new parts with the same specifications
- Correction of an error in the application documents.

8. Review of Guidelines

The contents of these Guidelines relating to launch vehicles are subject to change depending on the progress of technology, international development, etc. These Guidelines are to be reviewed as necessary, considering the future change in circumstances.