Order Regulating the Operation of Installations of the Guyana Space Center

Ground and Flight safety rules for launch operations.


COURTESY TRANSLATION

Philippe Baptiste

Chairman, Centre national d'études spatiales

CONTENTS

PREAMBLE

The Chairman of the Centre national d'études spatiales,

Viewed:

- ~~the agreement between the Government of the French Republic and the European Space Agency of December 16, 2008 on the Guiana Space Center and associated services~~;
  - The Agreement between the European Space Agency and the Government of the French Republic relating to the Guiana Space Centre and associated services (period 2023 - 2035), hereinafter referred to as the "CSG Agreement", signed on March 22, 2023, and in particular article 4.2, which states that CNES is responsible for the CSG master plan.
  - Act no. 2008-518 of June 3, 2008 on space operations (hereinafter the "Space Operations Act");
  - The French Research Code, in articles L331-1 to L331-8 and R331-1 to R331-27 relating to the Centre national d'études spatiales (hereinafter referred to as "CNES") and in particular article L331-6 I and II, which confers on the President of CNES a general safety mission and a mission to coordinate security measures;
  - The decree no. 65-388 of May 21, 1965 and its amendment by decree of July 25, 1967, declaring the construction of a satellite launch base in the French Guiana department by the Centre national d'études spatiales to be in the public interest and urgent, and the corresponding acquisition of the land on which the base is to be built;
  - The decree No. 89-314 of May 16, 1989, as amended, on the coordination of security measures during space launch operations in French Guiana;
  - The decree of January 22, 2001 establishing the extent of the zones and the easements applicable in the vicinity of the Kourou (French Guiana) radio electric center n° 9730510314 for the protection of radio electric reception against electromagnetic disturbances;
  - The decree No. 2009-643 of June 9, 2009, as amended, on authorizations issued in application of Law No. 2008-518 of June 3, 2008 on space operations;
  - ~~Decree no. 84-510 of June 28, 1984 on the Centre national d'études spatiales, as amended by Decree no. 2009-644 of June 9, 2009 (hereinafter the "CNES Decree");~~
  - ~~Order of June 2, 1988 on the creation of a restricted area (air traffic) (Kourou Guiana Space Center);~~
  - The order of June 2, 2006 establishing the list of sectors of vital importance and designating the coordinating ministers of said sectors;
  - The order of December 5, 2008 creating a no-fly zone identified as SO P3 in French Guiana;
  - The order of March 31, 2011, as amended, relating to the technical regulations in application of Decree No. 2009-643 of June 9, 2009 relating to authorizations issued in application of Law No. 2008-518 of June 3, 2008 relating to space operations (hereinafter the "technical regulations");
  - The decree of June 10, 2021 establishing the list of areas forbidden to aerial photography using photographic, cinematographic or any other remote sensing equipment.

- The order of January 2, 2023 setting the list of areas prohibited to capture and process data collected from aircraft.

- The ~~administrative~~ deed of transfer from the State to CNES, dated October 10, 1971, relating to ~~the Iles du Salut~~ the territory of the communes of Cayenne, Kourou, Nacouria and Sinnamary.

Orders:

PART I. GENERAL PROVISIONS

CHAPTER I.1 PRELIMINARY PROVISIONS

ARTICLE 1 - DEFINITIONS

Allocation: in accordance with article 1 of the technical regulations, the level of probability assigned to the occurrence of a feared or specified event, when drawing up safety objectives.

Authorized agents: all persons authorized, under the conditions set out in article R331-18 of the French Research Code (Code de la recherche) ~~and article 14-15 of the above-mentioned decree relating to CNES~~, to carry out the controls required to fulfil the missions set out in article L. 331-6 of the French Research Code.

Confined atmosphere: atmosphere in which air renewal may be insufficient to allow a person to stay safely.

Center spatial guyanais (CSG): technical, industrial and operational complex, the ~~perimeter of which is delimited by order of the minister in charge of space~~, grouping together establishments, companies and organizations of various statuses, and all the resources required for launch preparation and execution activities. These activities include the design, preparation, production, storage and transportation of space objects and their components, as well as tests and operations carried out in or from this perimeter.

~~**Neutralization chain**: all on-board equipment used to neutralize the launcher in flight~~.

CNES/Centre spatial guyanais (CNES/CSG): establishment or group of establishments of the Centre national d'études spatiales located within the CSG perimeter. It includes all facilities and personnel under the direct responsibility or authority of the director of the CSG establishment.

Common mode: Failure, external event or human error that invalidates the independence between two elements (function, hardware or software). Common modes can relate to design, production and implementation issues.

CSG flight safety resources: resources implemented or proposed by CNES/CSG (as telemetry stations, radars.) for the benefit of MSI and MSA missions. These resources are defined in a dedicated regulatory instruction.

Coefficient of safety: in accordance with article 1er of the technical regulations, ratio between the admissible limit of a parameter characterizing a system or component and its maximum expected value in nominal operation. Its value incorporates the notion of dispersion specific to each field concerned.

> **Rupture safety factor (Jr)**: ratio between the permissible rupture limit of a parameter characterizing a system or component and its maximum expected value in nominal operation. For any component of a pressurized fluid system, it is the ratio between the allowable pressure at rupture (the allowable pressure at rupture is the calculated relative rupture pressure, validated during qualification tests) and the maximum pressure expected in service (hereinafter "pms").
>
> **Instantaneous safety factor (Js)**: ratio between the permissible pressure at rupture and the relative pressure reached at the instant in question by the system in question.
>
> **Proof coefficient (Jt)**: ratio between the proof pressure and the maximum pressure reached in the presence of personnel for a given fluid system.

Declarant: any organization, facility, operator, project owner, prime contractor or agent of the above who intends to build a new facility or modify an existing facility within the CSG perimeter.

Environment: the environment in which an organization (plant, operator, project owner, project manager or representative of any of the above) operates, including air, water, soil, natural resources, flora, fauna, human beings and their interrelationships.

Establishment: all installations for production and operating activities, under the responsibility of the same operator and generally located on the same site, including their equipment and related activities when at least one of the installations is subject to legislation on classified installations for environmental protection and pyrotechnic safety. This definition is without prejudice to the classification given by other legislation (notably the Labour Code, the Tax Code, the Defence Code, the Environmental Code or the Commercial Code).

Explosive atmosphere: atmosphere liable to become explosive under particular local conditions.

External event: event whose origin is distinct from the launch vehicle, such as atmospheric conditions (e.g. wind and lightning) and the conditions of communication, navigation and surveillance services. This term does not include malicious acts.

Failure: Failure of a component (function, hardware or software) such that it can no longer operate as intended. The term includes late failure, early failure and erroneous operation. Note: Human error can cause failures, but is not considered a failure.

> **Advance failure**: an unwanted function is performed.
> **Delayed failure**: failure to perform a function when required.

Flight corridor: in accordance with article 1 of the technical regulations, the volume in which the launch vehicle is likely to operate ~~and beyond which it is neutralized,~~ taking into account nominal dispersions.

Fight phases of a launch vehicle: the different phases of flight of a space object are as follows:

> **Disposal phase:** in accordance with article 1 of the technical regulations, this is the final phase of the space operation, during which safety actions are carried out on the space object to limit the risks associated with space debris.
>
> **Launch phase**: has the meaning specified in Article 1 of the aforementioned law on space operations.
>
> Recovery **phase: during the** launch phase, the phase beginning with the separation of the recoverable element from the launch vehicle and ending with its immobilization on Earth.
>
> ~~- Return phase: in accordance with Article 1 of the technical regulations, the period starting with the re-entry of the space object into the Earth's atmosphere and ending when it is immobilized on the Earth's surface, as part of a controlled or uncontrolled re-entry.~~

Free-evolution domain: The free-evolution domain is a domain beyond the flight corridor in which the launch vehicle follows a trajectory compatible with safety risk control requirements during MSI. Beyond this domain, the launch vehicle is neutralized.

Human error: omitted or incorrect human action during the production or implementation phase.

Functional safety study: ~~an~~ analysis that identifies all technical and functional risks, demonstrates that the desired safety objectives have been met, enables risk prioritization to be taken into account right from the design stage, and

~~verifies~~ proposes the correct application of risk control measures.

Fail Operational (FO): fit for mission after a failure.

Fail Safe (FS): safe after a failure. Maintaining safety after two independent failures is defined as FS/FS.

Flegmatization: reducing the sensitivity of a material or pyrotechnic device to a given type of attack.

FSOA: French Space Operation Act

Ground facilities: any ground-based system used for launch preparation, timing and revalidation activities.

Hazardous activity: activity involving one or more hazardous products or systems, or taking place in a hazardous area.

Hazardous activities are classified into two categories, depending on how the state of the system changes during the course of the activity:

- Dynamic phase risk activity: risk activity during which at least one risk element of the system undergoes a voluntary or involuntary change of state (particularly mechanical, electrical, pneumatic or chemical);

- Activity at risk in static phase: activity at risk during which no element at risk in the system undergoes a change of state.

Hazardous product or fluid: product or fluid likely to cause damage by its intrinsic properties (mechanical, physical, chemical, biological, nuclear, thermal, etc.), or by reaction with the surrounding environment. This notion includes all hazardous substances and preparations as defined in current regulations, refrigerated liquefied neutral gases (nitrogen, helium, etc.) as cryotechnical fluids, and hot fluids.

Independence: Two devices, elements, functions, information, systems, etc., are said to be independent if they have no common failure mode and if they do not generate any reciprocal action between them.

Instruction de Coordination (IC): measure taken by the President of the Centre national d'études spatiales within the framework of the power to coordinate security measures provided for in articles ~~14-11 to 14-14 of the above-mentioned decree relating to the CNES~~.R331-14 to R331-17 of the French Research Code.

Instruction Réglementaire (IR): regulatory act issued by the President of the Centre national d'études spatiales or his delegate in application of a specific provision of the present decree.

Interception: interruption of the continuity of the potential path of a feared event or a specified function in a system at risk. The lifting of an interception is subject to the agreement of the safeguarding entity and is called "safeguard authorization".

Jr: see coefficient of safety at break.
Js: see instantaneous safety factor
Jt: see stamping coefficient.

Launch assembly (LE): all the facilities required to operate and control a type of launcher with a view to its launch or the on-site re-entry of a propelled stage in the case of a reusable vehicle.

~~Examples: ARIANE launch kit (ELA), SOYOUZ launch kit (ELS), VEGA launch kit (ELV.9.).~~

Launch system: consisting of the *launch vehicle* and the ground resources used for the launch.

Launch vehicle: in accordance with article 1°' of the technical regulations, an assembly consisting of the launcher and the space objects intended to be placed in orbit.
Note: to facilitate the writing of the present order, this notion also includes, where relevant, retrievable stages and reusable orbital modules. The latter constitute an independent vehicle as soon as they are separated from the initial launch vehicle. This term therefore encompasses the notion of re-entry vehicle defined in the technical regulation.

Limit of impact (LI): Cf. Art 61

L.B.B. (Leak Before Burst): failure mode of a pressurized vessel designed to limit the risk of shrapnel projection in the event of any type of structural defect. Only fluid leakage and its potential dangers need to be considered in this case.

Launch operator: any natural or legal person who, under its own responsibility, carries out a space launch operation, including a ground preparation phase and the launch phase as defined in the FSOA.

Maximum expected pressure in service (pms / MEOP): the maximum relative pressure that a pressurized fluid capacity, organ or component is likely to experience during its operational life, in the context of its operating environment.

Mean exposure limit value (VLEP 8h ~~VME~~): value of the concentration of a toxic substance in the atmosphere of a workplace, accepted for a maximum duration of exposure of personnel over the duration of a work shift (8 hours), without risk of damage to health. This value is defined by the French Labour Code.

Neutralization: in accordance with article 1" of the technical regulations, intervention on the launch vehicle to ensure the safety of people and property, and to protect public health and the environment. In particular, it can be characterized by an action to destroy or permanently stop the thrust of a launch vehicle, in order to put an end to the flight of said vehicle or of a stage that is no longer operating correctly.

Neutralization system: all on-board ~~ground remote control~~ systems ~~and on-board neutralization chains~~ directly involved in neutralizing the launch vehicle in flight.

Nominal: corresponding to the specifications or performances announced by the operator or designer of the space object, in accordance with article 1-' of the technical regulations.

On-board functional: any on-board element involved in the evolution of the physical and kinematic state of the launch vehicle. This is to be distinguished from the commonly accepted meaning of the functional analysis of a system in relation to its specifications, which includes all the system's sub-functions.

On-board (or flight) safety system: consisting of on-board neutralization, localization and telemetry systems for the CNES President's safety mission.

Overall safety objective: control of risks (in the event of a delayed failure) to ensure the protection of people, property, the environment and public health. The overall safety objective is defined throughout the trajectory of the launch vehicle, including the specific part of MSI. In particular, it is expressed in terms of reliability objectives for the neutralization or localization system.

Payload: object (satellite, probe, etc.) intended to be loaded onto a launcher for launch into extra-atmospheric space.

Payload manufacturer: a company contracted directly or indirectly to the launch operator, responsible for preparing and implementing a payload within the CSG perimeter, with a view to its launch.

Predictive intervention criteria: criteria for neutralizing the launch vehicle before the end of the safety and intervention mission as specified in I'- Article 63 - of this order, based on the impossibility of the space vehicle reaching a stable orbit in terms of the safety of people and property and the protection of public health and the environment, taking into account various modelled failure cases or taking into ~~account~~ the possibility of a stage falling back to earth.

Proof test: test to pressurize a system to a specified pressure, known as the proof pressure.

Redundancy: Two or more independent means implemented to perform a given function.

Re-entry

Uncontrolled Re-entry: in accordance with article 1 of the technical regulations, atmospheric re-entry of a space object for which it is not possible to predefine the ground impact zone of the object or its fragments.

Controlled Re-entry: in accordance with article 1 of the technical regulations, atmospheric re-entry, destructive or not, of a space object with a predefined zone of contact or impact on the ~~ground of~~ the object or its fragments.
Controlled re-entry can be carried out either on site with precision, or by targeting a limited area with a certain level of confidence.

Risk: a two-dimensional quantity associated with a specific circumstance in the life of a system, characterizing a feared event in terms of the severity of its consequences and the probability of its occurrence.

Risk level: in accordance with article 1" of the technical regulations, probabilistic estimate characterizing the insecurity of a system with regard to a feared event, expressed by the probability of occurrence of this event.

Risky element: a ~~constituent part of a risk system or part of a system which, in the event of material or human failure(s), can generate a dreaded event with catastrophic or serious consequences~~. Part of a system which, in the event of a failure, external event or human error, could give rise to a dreaded event with catastrophic or serious consequences.

Risky system: a system that meets at least one of the following two criteria:

- It contains one or more hazardous products or fluids;
- It consists of one or more elements risky element

Safety barrier: function, product, hardware, software or human intervention that prevents the occurrence or progression of an event detrimental to safety.
These may include:
- A physical property;
- An intrinsic characteristic of the product, hardware or software;
- A technological device.

Exceptionally, and with due justification, this barrier may consist of a procedure. The effectiveness of a safety barrier is assessed by its reliability.

Passive safety barrier: safety barrier whose function is ensured without human intervention and without stored energy, in order to protect against possible early failure.

Safe-life: duration and required number of cycles during which it is demonstrated by test or analysis that a structure, even if it contains the largest crack not detectable by inspection means, will not fail under the expected load and service environment.

Safeguarding entity: an entity within each plant located within the CSG perimeter, which ensures that safeguarding measures are respected within its plant, and which is the main contact for authorized agents. This entity is independent of those in charge of production or operations within the same plant.

Security entity: an entity within each facility located within the CSG perimeter, responsible for ensuring compliance with security measures within the facility and acting as the main contact for authorized agents. This entity is independent of those in charge of production or operations within the same facility.

Safety contour: see CS, article 61.1

Safety (general mission of safety): in accordance with article 21 of the aforementioned law on space operations, ~~chapter I of title IV of the aforementioned decree on CNES~~, and articles R331-10 to R331-19 of the French Research Code, all provisions designed to control the technical risks associated with the preparation and execution of launches, in order to ensure the safety of people and property and the protection of public health and the environment, on the ground and in flight.

Ground **safety**

All provisions:

- Intended to control the technical risks arising from activities taking place on the ground and contributing to the flight of a launch vehicle, including its possible partial recovery;
- Supplements to the applicable safety and environmental protection regulations, made necessary by the specific features of the site's activities.

In-flight **safety**

All the measures designed to control technical risks during the flight of a launch vehicle controlled from the CSG, including the controlled re-entry phase on site, if any.

The aim of these provisions is to ensure the safety of people and property and the protection of public health and the environment on the Earth's surface, for aircraft in flight or in outer space, against any damage that may result from the in-flight operation of the said vehicle.

Safety system: comprising neutralization, localization, telemetry systems including CSG ground resources deployed for the CNES President's safety mission.

~~Schéma d'implantation (or~~ Schéma directeur: document referred in article ~~14-8 of the aforementioned CNES decree~~ R331-11 of the French Research Code, relating to land use at CSG:

- Synthesizing the regulatory constraints relating to the safety of people and property, the protection of public health and the environment, and the implementation of equipment linked to the current use of the CSG site and its peripheral zone;
- Characterizing each zone (launch zone, industrial zone, natural zone);
- Determining the potential of open areas and their possible future.

Segregation: Setting up a physical barrier (protection) or distance (separation) between two material elements.

Security: measures relating to the protection of persons and installations, as provided for by the applicable laws and regulations, the implementation of which is coordinated by the President of the Centre national d'études spatiales, under article ~~14-11 of the aforementioned CNES decree.~~ R331-14 of the French Research Code.

~~**Space system: in** accordance with article 1" of the technical regulations, an assembly consisting of one or more space objects and their associated equipment and facilities, designed to fulfil a specific mission. In the case of a launch operation, the space system is an assembly consisting of the launcher, the interfacing launch base, including tracking stations, and the space object to be launched. For a control operation, the space system consists of the space object and the interfacing ground segment~~.

Short-term limit value (STLV): value for the concentration of a toxic substance in the atmosphere of a workplace, permissible for a maximum exposure time of fifteen minutes, without risk of damage to health. This value is defined by the French Labour Code.

Space object: in accordance with article 1 of the technical regulations, any object of human origin, functional or not during its launch, its stay in extra-atmospheric space or its return, including the components of a launcher placed in orbit.

Technical event: any voluntary or involuntary event occurring in hardware or software that may lead to an expected deviation from the original definition, including in terms of performance (modification), or an unanticipated deviation (anomaly).

Technical risk: in accordance with article 1°' of the technical regulations, risk of technological, industrial, operational, human or natural origin. Expression used to differentiate technical risk from any other type of risk, particularly financial or related to the safety of installations.

Threshold of irreversible effects (SEI): threshold delimiting the zone of significant danger for people. SEI threshold values are defined by legislation governing facilities classified for environmental protection.

Toxic launch hazard zones (ZRTL)**:** see article 61.1

Toxic risk atmosphere: atmosphere likely to contain substances toxic to humans.

Tracking: remote determination of variables characteristic of the relative movements of a space object.

Zone à risques: areas where all types of risks are present (due to the presence of chemicals, ATEX zones, anoxia, etc.).

Zone à risques au lancement (ZRL): Cf. article 61.1

Zone de danger (Hazardous Zone) ~~**(or danger zone, or risk zone, or effect zone)**~~: ~~zone that could be the site of effect(s) likely to cause damage, due to the proximity o f one or more systems at risk.~~
zone defined by calculating effect distances related to an accident scenario identified (fire, explosion, etc.) as part of the hazard study.

~~Zone proche (~~**Near zone:** area authorized for the evolution of the launch vehicle during the first moments of flight. ~~The near zone ends no later than the radio electric horizon or the range limit of the CNES/CSG TCN.~~

Zone protégée: see ZP, article 61.1

ARTICLE 2 - SCOPE OF APPLICATION

This order is a special police regulation governing the operation of facilities at the Guiana Space Center (CSG). It defines the administrative police measures applicable to activities carried out in or from the CSG perimeter, pursuant to 1. of article L.331-6 of the Research Code and articles R331-10 to R331-13 as well as R331-18 and R331-19 of the Research Code ~~14-7 to 14-10 as well as 14-15 and 14-16 of the aforementioned decree relating to the CNES~~, without prejudice to legislation and regulations otherwise applicable.

The provisions of the CNES internal regulations relating to *security and protection* apply to all CSG site personnel, subject to the special rules concerning staff representatives and trade unions (art. 1.2 of the internal regulations). Employees of external companies working on CSG premises remain under the authority of their employer for disciplinary matters;

ARTICLE 3 - CONTROL PROCEDURES

Any person referred to in article R331-10 of the French Research Code14 ~~14-7 of the above-mentioned decree relating to the CNES~~ shall designate a contact person for the agents authorized to carry out the controls necessary for the fulfilment of the special police mission for the operation of CSG facilities, under article R 331-18 of the French Research Code ~~14-15 of the same decree.~~ In this respect, the President of CNES may take any measures deemed necessary to carry out this mission~~.~~

Authorized agents have access ~~to~~ all CSG sites and facilities, under the conditions set out in article L.331-6 Ill. of the French Research Code.

Their presence is compulsory at launch centers during the final launch sequence, and/or during the controlled re-entry or recovery phase, in order to monitor in real time, the handling of any particularities and contingencies that may jeopardize safety and security, in close liaison with the representatives designated by the launch operator. In this context, the launch operator provides the authorized agents with the necessary technical and logistical resources and information.

CHAPTER I.2 ORGANIZATIONAL AND PROFESSIONAL REQUIREMENTS

ARTICLE 4 - GENERAL OBLIGATIONS OF PLANT OPERATORS OR OWNERS

Any person referred to in article R331-10 of the French Research Code ~~14-7 of the aforementioned CNES decree~~ is subject to the following obligations:

- Control the configuration of your installations and their upgrades;
- Operate and maintain these facilities under the required safety conditions and in compliance with environmental requirements;
- Set up a safeguard entity and a safety entity, specific to its establishment as defined in -Article 1 - of the present order;
- Keep the President of the Centre national d'études spatiales informed without delay of any modification to equipment, systems, configurations, operating plans or procedures, as well as of any technical fact, incident or accident, which may, within the meaning of Article 21 and Article 23 of this order, affect the safety of persons and property, the protection of public health and the environment, or generate new risks.
- To obtain the opinion of the President of the Centre national d'études spatiales for all regulatory studies which, in the sense of Article 21 and Article 23 of the present order, are likely to affect the protection of persons and property, public health and the environment, or to generate new risks.

ARTICLE 4.1 - GENERAL OBLIGATIONS OF OWNERS AND CONTRACTORS

The President of CNES must be informed of any project within the CSG enclosure that could lead to environmental degradation, as early as the feasibility phase.

ARTICLE 5 - ORGANIZATION, FACILITIES AND RESOURCES

All persons referred to in article R331-10 of the French Research Code and article ~~14-7 of the above-mentioned CNES decree~~ must have the skills and resources required to prepare and implement the activities they carry out, in particular:

- Appropriate organizations and facilities for manufacturing, integration, testing, preparation of the launch vehicle (and, where applicable, the recovery phase) and execution of the launch operation (and, where applicable, the recovery phase);
- Qualified industrial processes and procedures;
- Suitable numbers of qualified personnel;
- Equipment, tools, software and materials adapted to the activity in question;
- Documentation of tasks, responsibilities and procedures;
- Access to data useful for preparing the planned activity;
- Recording, processing and archiving technical data;
- Handling technical facts.

ARTICLE 6 - SUBCONTRACTORS, SUPPLIERS AND CUSTOMERS

Any person referred to in article R331-10 of the French Research Code ~~14-7 of the aforementioned CNES decree~~ must:

- Inform its subcontractors and suppliers of the application of this decree within the CSG perimeter;
- Ensure that its subcontractors and suppliers working within the perimeter of its premises comply with the provisions of this decree.

The launch operator is also responsible for ensuring that its customers and, where applicable, the payload manufacturer, apply the provisions of this order.

ARTICLE 6.1 - SENSITIVE INFORMATION AND PHOTOGRAPHY

In progress

PART II. ACCESS AND TRAFFIC RULES

ARTICLE 7 - RELATION TO REGULATIONS ON PLANT SAFETY

~~The access and circulation regime set out in the present order is without prejudice to the application of regulations relating to activities of vital importance, in particular the order of June 2, 2006 designating space as a sector of activities of vital importance, and the security measures linked to the classification of the Guiana Space Center as an Etablissement à Régime Restrictif d'Accès (Establishment with Restricted Access) by the Secrétariat Général de la Défense et de la Sécurité Nationale (General Secretariat for Defence and National Security), under the terms of which the majority of installations distributed within the perimeter of the CSG are also classified as Installations d'Importance Vitale (Installations of Vital Importance). These facilities are sectorized into protected zones subject to the provisions of articles 413-7 and 413-8 of the French penal code.~~
~~The President of the Centre national d'études spatiales coordinates and ensures the implementation of these regulations in facilities within the CSG perimeter, and issues any necessary coordination instructions in this respect, in accordance with the provisions of article 14-13 of the aforementioned decree relating to the CNES.~~

To be renewed

ARTICLE 8 - ACCESS RULES ~~FOR PEOPLE AND VEHICLES~~

ARTICLE 8.1 ACCESS FOR PERSONS AND VEHICLES

All persons, vehicles and transported goods entering a facility within the CSG perimeter are formally identified, controlled and authorized.

~~This identification and authorization of~~ All persons and vehicles get ~~the form of~~ a personal badge and a ~~individual~~ vehicle pass ~~adapted to different access situations~~. The badge indicates ~~the organization to which the person belongs, and~~ its period of validity. The badge must be worn visibly at chest level at all times.

The badge, which is the property of the Centre national d'études spatiales, is issued in the name of the President of the Centre national d'études spatiales and must be returned in accordance with the terms and conditions specified at the time of issue or at the request of the Centre national d'études spatiales.

Completion of the safeguarding training provided for in Article 9 of this order is a condition for obtaining or renewing this access badge.

Specific conditions of access to the facilities for persons and vehicles are specified by regulatory instruction from the President of the Centre national d'études spatiales and its delegates.

For reasons of safety and security, authorized staff may search vehicles at any time, in the presence of the driver, at exits and entrances to fenced and filtered areas of the CSG. Such searches may also be carried out on the premises, in agreement with the heads of the establishments concerned.

For the same reasons, these officers can have a vehicle removed or relocated if it is parked in a disruptive manner.

ARTICLE 8.2 ACCESS TO CERTAIN FACILITIES

Access control to certain rooms or areas is carried out by programming an electronic card, according to the following criteria:

- A of the safety and safeguard measures implemented in the premises or area concerned;
- The need to know for the course of the activity of the personnel concerned;

- Defence clearance required for access to certain premises or areas, or to take part in certain activities.

The need for access to these premises or areas is the subject of a programming request by the head of the establishment concerned to the President of the Centre national d'études spatiales.

Article 8.3 Access to a hazardous area

In a hazardous area, a permanent means of liaison between the safeguarding entity concerned and the people carrying out the activity in the area is required. When working on a risky system, a team of at least two people is required. Nevertheless, the number of people allowed to be simultaneously in the danger zones of a risky operation is kept as low as possible.

In the event of activity in a high-risk area without intervention on a high-risk system, a single person can intervene. In this case, the required permanent link with the relevant safeguard entity can be replaced by a permanent link with the CSG fire department rescue center.

Access to certain areas may be subject to the nature of the risks generated by the activities and to the use of appropriate collective or individual protective equipment.

Article 8.4 Overflight

CSG airspace is forbidden to be overflown by any vector (drone, helicopter, airplane, ULM, etc.) in accordance with the decrees of December 5, 2008 and January 2, 2023 referenced in the preamble to this order. Aerial photography is also prohibited in accordance with the order of June 10, 2021 referred to in the preamble to this document.

Article 8.5 precautionary measures

In order to protect the safety of people and property, the CSG Director may take any necessary precautionary measures (such as temporarily withdrawing the vehicle pass or access badge) in the event of a breach observed by the agents authorized by the CNES President~~.~~

These precautionary measures may subsequently lead to disciplinary action, up to and including temporary or permanent withdrawal of the CSG access badge in the event of serious misconduct. In the event of temporary withdrawal of the badge, return to the site may be conditional upon completion of a training course.

Article 9 - Safeguarding training

Any person likely to travel unaccompanied in hazardous areas within the CSG perimeter must receive "sauvegarde" training, the content and conditions of which are specified by regulatory instruction from the President of the Centre national d'études spatiales.

~~Safeguarding training is a minimum prerequisite for any pyrotechnic authorization issued under the applicable legislation on pyrotechnic establishments.~~

Article 10 - Access control measures

Access to certain areas and premises is controlled by electronic and video surveillance systems. To this end, ~~the President of the Centre national d'études spatiales will issue a regulatory instruction specifying the various security systems, and their installation and implementation procedures, t o ensure overall consistency and technical compatibility with existing systems and networks.~~

Article 11 - Traffic rules within the CSG perimeter

The Highway Code applies to all roads and lanes within the CSG perimeter. The special traffic police powers of the President of the Centre national d'études spatiales are exercised without prejudice to the general traffic police powers of the Prefect of French Guiana.

The President of the Centre national d'études spatiales may be required to close or restrict public traffic on all or part of the roads or lanes located within the CSG perimeter, for ~~safety~~ and/or security reasons related to the conduct of activities within the CSG.

~~It is forbidden to~~ Stop or park vehicles of any category is forbidden on the shoulders defined by the Instruction Réglementaire of the President of the Centre National d'Etude Spatial. ~~of the portion of the Route de l'Espace between the Carapa section and the Orchidée guard post.~~ Regulatory signs indicate this prohibition.

ARTICLE 12 - EVACUATION OF A FACILITY OR AREA

In accordance with article R331-11 of the French Research Code (Code de la recherche) ~~and article 14-8 of the above-mentioned decree relating to the CNES~~, the President of the Centre national d'études spatiales may, in the event of an activity presenting a serious danger to persons or property or to the protection of the environment or public health, evacuate any facility or any built-up or natural area located within the CSG perimeter.

These activities include payload transfer, launcher transfer, launch timing and controlled re-entry or recovery.

The content and conditions for launch chronologies are specified by Instruction Réglementaire du President of the Centre National d'Etude spatiales.

ARTICLE 13 - ACCESS, CIRCULATION, RESIDENCE AND EVACUATION OF THE ÎLES DU SALUT

The conditions of access, circulation and residence on the *Îles du Salut*, which include operational technical installations linked to space activities and hotel and tourist facilities, and which are notably subject to a protection easement agreed with the Conservatoire de l'espace littoral et des rivages lacustres, are specified by regulatory instruction from the President of the Centre national d'études spatiales.

The President of the Centre national d'études spatiales may prohibit access to these islands and order their evacuation under the conditions set out in Article 12 of this order. In all cases, persons not involved in the launch activity are evacuated from the islands during launch operations **and** during a controlled re-entry or recovery phase.

ARTICLE 14 - ACCESS TO AND EGRESS FROM THE RECREATION AREA

The President of the Centre national d'études spatiales may prohibit access to the recreation zone, which includes the CSG airfield and sports and community facilities, and order its evacuation under the conditions set out in article 12 of this order.

In any case, the recreation area is evacuated in launch chronology **and** during a controlled re-entry or recovery phase.

ARTICLE 15 - ROAD TRANSPORT OF DANGEROUS GOODS

The transport of dangerous goods by road within the CSG perimeter is governed by regulations governing the transport of dangerous goods by road (ADR).

If the regulatory provisions of the ADR cannot be implemented due to the specific nature of the space objects or their components, the transport of these objects or components is subject to specific safety and security measures, which are specified by regulatory instruction and coordination instruction issued by the President of the Centre national d'études spatiales.

Any planned delivery within the CSG perimeter of Class 1 items, excluding those classified as 1.4S in transport packaging, and Class 7 items within the meaning of the ADR, is subject to a specific request for access to the President of the Centre national d'études spatiales no later than 30 days prior to the planned date of arrival.

PART III. INSTALLATION RULES

ARTICLE 16 - INSTALLATION LAYOUT

Ownership of the land on which the CSG was built, and of the Îles du Salut, was transferred to the Centre national d'études spatiales by the French government in an administrative deed dated October 20, 1971. Part of this land is made available to the European Space Agency by the Centre national d'études spatiales at the request of the French State, under the ~~aforementioned~~ Agreement ~~between the French Government and the European Space Agency relating~~ to ~~the CSG and associated services~~.

Any creation or modification of a facility or construction within the CSG perimeter subject to building permit, as well as any modification of a facility at risk or located in a danger zone or that may affect the CSG's roads and major networks, must comply with the diagram relating to the siting of facilities, roads and networks, drawn up by regulatory instruction from the President of the Centre national d'études spatiales, with the provisions of this PART Ill, and with those of CHAPTER V.1 and CHAPTER V.2 of this order.

ARTICLE 17 - PROVISION OF LAND

The President of the Centre national d'études spatiales delimits the perimeter of the land allocated to the proposed site, in accordance with ~~the studies carried out under the legislation on facilities classified for environmental protection~~, the Environmental Code and the Labour Code relating to pyrotechnic safety.

As soon as construction begins, the owner of the facility must mark the right-of-way with a perimeter fence or appropriate signage.

The President of the Centre national d'études spatiales keeps an up-to-date reference plan of the land made available.

ARTICLE 18 - PLANT OPERATION

Any owner or operator of a facility located within the right-of-way of the land assigned to it is required to ensure the overall upkeep of the right-of-way and to maintain the signs or fences marking it.

In accordance with the current "Protocole d'accord entre les *opérateurs d'importance vitale* du CSG relatif à la sécurité des activités d'importance vitale", operators apply all safety and security rules issued by CNES as part of its general safety and security coordination mission.

ARTICLE 19 - CHANGE OF OPERATOR

Any project to change the operator of a CSG facility is submitted to the President of the Centre national d'études spatiales, who verifies that the new operator meets the requirements of Article 5 of the present order.

ARTICLE 20 - TERMINATION OF BUSINESS

Any owner or operator of a facility that ceases to operate must, at his or her own expense and before ceasing operations, restore it to a condition that will not endanger the safety of persons and property or the protection of public health and the environment, and that is compatible with the CSG master plan. Prior to cessation of activity, the President of the Centre national d'études spatiales may, in this respect, without prejudice to the application of legislation relating to classified installations for the protection of the environment, impose, at the expense of the holder or operator, the rehabilitation, dismantling or destruction of the installations and the restoration of the affected land to its original state.

PART IV. GENERAL SAFETY RULES

CHAPTER IV.1 GENERAL SAFETY OBJECTIVES

ARTICLE 21 - RISK CLASSES FOR GROUND AND IN-FLIGHT ACTIVITIES

Two categories of risk class are defined in this decree, according to the severity of the damage:

Risk classes	*definition of damage*
Risk with catastrophic consequences G0A class risks	• **Immediate or delayed loss of life** • **Permanent disability** • **Irreversible damage to public health**
Risk with serious consequences G0B class risks	• **Serious injury to persons without loss of life or permanent disability** • **Reversible damage to public health** • **Major property damage:** - Total or partial destruction of public or private property - Total or partial destruction of a facility critical to ~~to~~ launch operation • **Significant environmental damage**

It is specified that catastrophic environmental risks are included in the risk class with catastrophic consequences for human life and public health, as they entail one of the damages defined for this class.

ARTICLE 22 - REQUIREMENTS FOR GROUND OPERATIONS

Principles:

Any high-risk system identified under the conditions set out in -Article 29 -, -Article 30 - and -Article 31 - of this decree and implemented as part of ground operations must meet a clearly identified reliability objective compatible with the qualitative and quantitative requirements below. This reliability objective must explicitly contribute to the safety of people and property, and to the protection of public health and the environment.

Demonstration of compliance with the objective ~~of~~ must take into account aspects relating to the equipment and its implementation, and may be based on operating safety rules and methods recognized in the good practice guide provided for in article 54 of the technical regulations.

Qualitative requirements:

1. For any risky activity carried out within the CSG perimeter or from the CSG, space systems, safety systems, integrated stages and associated ground systems must meet the following requirements:

Activity presenting risks with serious consequences: single fault criterion

No failure (simple breakdown or human error) should present a risk of serious or, a *fortiori,* catastrophic consequences (the so-called "Fail Sale" (FS) character).

However, compliance with the single-fault criterion is not required:

- For a launch system, from the moment when the launch operation becomes irreversible, until its safe return in the event of an aborted launch attempt;
- For a space object during its controlled re-entry phase on site, right up to its safe return.
- For the structural elements of a launcher or payload where the application of the said criterion is not feasible under economically acceptable conditions, given the state of knowledge and practices and the vulnerability of the environment in which the said launcher is likely to operate.

Activity presenting risks with catastrophic consequences: double failure criterion

No combination of two failures (failure or human error) should present a risk with catastrophic consequences (FS/FS ~~or FO/FS~~).

The double failure criterion does not apply to the combination of two human errors.

2. The qualitative requirements set out in 1°' above do not apply to structural elements, which are dimensioned in accordance with appropriate standards and engineering methods, in order to ensure an equivalent level of safety. A regulatory instruction issued by the President of the Centre national d'études spatiales specifies these standards and methods.

Quantitative requirements:

For any risky activity with catastrophic consequences carried out within the CSG perimeter, the maximum acceptable probability of at least one casualty (collective risk), taken into account for the sizing of launch systems, test benches and associated technical means, is 10-09/h. ~~10-6 per launch preparation or test campaign.~~

~~Article 23 - Risk classes for flight activities~~

~~A single class of risk is defined in the context of this order for in-flight events that could lead to damage to the Earth's surface.~~

~~*Risk classes*~~	~~*definition of damage*~~
~~Risk with catastrophic consequences~~	~~**• Immediate or delayed loss of life**~~ ~~**• Serious injuries**~~ ~~**• Irreversible damage to people's health**~~

~~It is specified that catastrophic environmental risks are included in the risk class with catastrophic consequences for human life and public health, as they entail one of the damages defined for this class.~~

Article 24 - Requirements for in-flight activities

Principles:

Any high-risk system identified in accordance with the conditions laid down in Article 32 of the present Order, and used in flight, must meet a clearly identified reliability objective compatible with the qualitative and quantitative requirements below. This reliability objective must explicitly contribute to the safety of people, the protection of public health and the environment**, and the** protection of property.

Demonstrating that the reliability objective has been met must take into account aspects relating to the equipment and its implementation, and be based on the operating safety rules and methods recognized in the good practice guide provided for in article 54 of the technical regulations.

Qualitative requirements

Safety Contour Protection

~~Activities presenting risks with catastrophic consequences~~ Measures to protect the boundary of the Safety contour must satisfy the *double failure criterion*, defined as follows: no combination of two failures (failure or human error) must present a risk with catastrophic consequences (FS/FS ~~or FO/FS~~).

The double failure criterion does not apply to the combination of two human errors.

Impact limit protection (LI)

Measures to protect the Impact Limit must meet the single failure criterion, defined as follows: no single failure (breakdown or human error) must present a risk with serious consequences (FS criterion).

Quantitative requirements

Flight-related qualitative requirements fall within the general framework set by the technical regulations, and may be specified by a dedicated regulatory instruction.

Article 25 - Software

Software which contributes ~~directly or indirectly~~ to the safety of people and property, and to the protection of public health and the environment, and in particular that which constitutes a safety barrier, is subject to criticality analysis in order to deduce the design, development and validation requirements and risk reduction measures appropriate to its criticality. Criticality analyses include the contribution of external components/libraries and support tools (development tools, verification tools or parameterization tools).

These elements are submitted to the President of the Centre national d'études spatiales in accordance with the provisions of CHAPTER IV.2 of this order.

Software at risk of catastrophic consequences (on the ground and in the MSI phase) must be independently validated.

The source code of any software with a risk of catastrophic consequences (on the ground and in the MSI phase), as well as any other element required to rebuild and/or compile the source code into a binary or executable version of the software, and to validate and understand it (in particular its documentation), must be made available to the President of the Centre national d'études spatiales.

CHAPTER IV.2 SAFETY PROCEDURE

Article 26 - Safety submission process

An iterative and continuous process known as "safety submission" enables the President of the Centre national d'études spatiales to verify compliance with the provisions of the present order by any person referred to in article R331-10 of the French Research ~~Code14-7 of the aforementioned CNES decree.~~

This person, for each risky activity he intends to carry out:

- Identifies and assesses the risks defined in - Article 21 - and - Article 23 - of this order;

- Implement a risk reduction program, where appropriate.

As soon as possible, it provides the President of the Centre national d'études spatiales with a written file demonstrating compliance with the provisions specific to each type of safeguard submission, as set out respectively in articles 29 to 32 of this order.

ARTICLE 27 - PROCESSING CHANGES

Any modification to a launch vehicle, a payload, a ground installation and associated equipment, the use or implementation of which presents risks with serious or catastrophic consequences as defined in Article 21 and Article 23 of this order, is subject to a new safeguard submission, in accordance with the procedure set out in Article 26 of this order.

ARTICLE 28 - DEALING WITH NON-CONFORMITIES

If it is impossible to comply with one or more of the provisions of this order, any person referred to ~~iarticle 14-7 of the aforementioned CNES decree~~ R331-10 of the French Research Code may submit a written request for a derogation to the President of the Centre national d'études spatiales, together with supporting documentation, which must specify and give reasons:

- The impossibility, in the case in question, of taking all measures to establish, maintain or re-establish compliance with the provisions of this decree;
- The measures taken to come as close as possible to compliance with the provisions of the present by-law;
- The level of residual risk arising from non-compliance.

The Chairman of the Centre National d'Etudes Spatiales may grant an exceptional waiver by express decision, in particular to take account of the current operating environment.

ARTICLE 29 - GROUND INSTALLATIONS

The declarant is clearly identified. In the absence of identification, the declarant is the project owner in the case of a new installation, or the operator concerned in the case of a modification to an existing installation.

The declarant submits to the President of the Centre national d'études spatiales the file provided for under Article 26 of this decree, justifying compliance with the provisions of this article and with the regulations applicable to ground installations set out in CHAPTER V.1 and CHAPTER V.2 of this decree.

Phase 0 - Feasibility

The feasibility file must include a preliminary risk analysis ~~study based on the~~ following elements:

- Features concerning:
  - The nature and hazards of the products under consideration;
  - Maximum quantities of each of these products in the facility.
  - The list of systems at risk and their preliminary description;
  - A description of the operating methods and technical options envisaged, in particular:
    - The type of activities carried out in the plant;
    - Any associated equipment used;
    - Operational constraints related to activities, such as evacuating areas, incompatible activities or limiting the number of people present;
    - The plant's interfaces with existing roads and major networks.

- Reference trajectories in the case of a launch zone.

This ~~elided~~ analysis must demonstrate:

- That the proposed installation complies with ['-Article 16 - of this order;
- Compliance with applicable laws and regulations on environmentally classified facilities and pyrotechnic safety.

Phase 1 - Design

The design file must include:

- Definition files for the installation and its equipment, incorporating the specifications and comments made by the President of the Centre national d'études spatiales at the end of phase 0;
- Operating procedures that are sufficiently detailed to ensure that the operational constraints defined during the feasibility phase are taken into account;
- The regulatory studies required to obtain operating authorizations under legislation governing classified installations for environmental protection and pyrotechnic safety, in accordance with the conditions laid down by this legislation. These **regulatory** studies are provided to the President of the Centre national d'études spatiales, under the conditions laid down in the instruction issued by the latter as part of its mission to coordinate safety measures, as defined in II. of article L. 331-6 of the French Research Code.

Phase 1 is completed on receipt of the building permit.

Phase 2 - Production

Authorized agents must be able to do so at any time during the installation phase, under the conditions stipulated in article 3 of the present order:

- Carry out site visits;
- Verify and confirm the operability of the installation in accordance with the operational deployment plan and the planned operating procedures; to this end, they attend acceptance and technical qualifications, and
- Operation of systems whose malfunction could be detrimental to the safety of people and property, and to the protection of public health and the environment;
- Verify the harmlessness of installations on the reliability and safety of tracks and major networks.

Phase 2 is completed once the technical acceptance of the installation has been completed.

Phase 3 - Implementation

The declarant submits to the President of the Centre national d'études spatiales a file attesting to the mastery of the configuration of any installation at risk and the maintenance over time of compliance with the provisions of the present order. The opening of the phase 3 file submission is independent of the closing of phases 0 to 2 mentioned above. It must begin as soon as possible, as soon as the definition of the installation and its validation and operating procedures are sufficiently known.

The implementation file must include:

- Application specifications;
- Implementation procedures;
- Safety instructions for the site and the activities taking place there.

ARTICLE 29.1 - GROUND EQUIPMENT

The declarant, or any person responsible for the design or development of a ground facility, submits to the President of the Centre national d'études spatiales the file provided for under Article 26 of the present order, which includes proof of compliance with the provisions of the present article and with the rules applicable to ground facilities provided for in CHAPTER V.1 and CHAPTER V.2 of the present order.

Phase 0 - Feasibility

The feasibility file must include:

- Project specifications;
- A description of the technical choices and solutions envisaged for the project, together with a description of the operating procedures;
- A list of systems at risk, together with a preliminary description;
- The nature and hazards of the proposed activities;
- Preliminary analysis of the risks associated with implementing activities, identifying system-level risks, circumstances and potentially risky events;
- A list of applicable legislation, regulations, standards and specifications.

Phase 1 - Design

The design file must include:

- The definition files for the medium and its equipment, incorporating the specifications and comments made by the President of the Centre national d'études spatiales at the end of phase 0.
- Evaluating design choices;
- Sizing notes for the means and its equipment, in accordance with appropriate engineering standards and methods;
- Risk identification and minimization studies;
- Qualification plans for high-risk systems;

Phase 2 - Realization / qualification

The production/qualification file must include:

- An additional risk analysis and assessment of the risk level of the system and associated equipment to demonstrate that the safety objectives have been met;
- Management of critical parameters;
- Assessment of qualification results;
- The plan of operations for implementing the system and the associated risk activities.

Phase 3 - Implementation

The implementation file must include:

- Implementation specifications, including safety measures;
- Operating plans;

The Chairman of the Centre national d'études spatiales may request the following documents:

- The user manual for;

- Procedures for using ground resources;
- Acceptance reports for all equipment and test certificates for pressure vessels;
- Authorizations for the possession and use of equipment subject to administrative authorization under the relevant regulations (e.g. objects emitting ionizing radiation).

ARTICLE 30 - PAYLOADS

The payload manufacturer, under the responsibility of the launch operator, submits to the President of the Centre national d'études spatiales the file provided for under Article 26 of this Order, which includes proof of compliance with the provisions of this Article and the rules applicable to payloads provided for in CHAPTER V.1 and CHAPTER V.3 of this Order.

When the system has been designed on the basis of a system that has already been submitted, the new submission can be made "by difference". ~~This type of submission "by difference" can only be implemented twice within a three-year period. Beyond that, a new submission of a complete file is required.~~

Phases 1, 2 and 3 can be run in parallel, with the opening of one phase not being conditional on the closing of the previous one.

In the case of a space object making a controlled re-entry on site after a launch operation, the operator of the space object will provide guarantees of its safekeeping until its departure from the CSG or before operations aimed at its integration on another launch. Space objects and/or their reusable components, as well as their ground operations, are subject to the present safety submission process.

Phase 0 - Feasibility

The feasibility phase is optional, except for new platforms using innovative technologies. The feasibility file must include:

- Project specifications;
- ~~A presentation~~ A description of the technical choices and solutions envisaged for the project as well as a description of the operating procedures;
- The list of systems at risk and their preliminary description;
- The nature and hazards of the proposed activities;
- ~~A list of risks related to on-board systems and associated specific ground equipment~~
- Preliminary analysis of risks associated with the implementation of activities, identifying system-level risks, circumstances and potentially risky events;
- ~~Where applicable~~, a list of legislation, regulations and standards applicable to the project.

Phase 1 - Design

The design file must ~~include at least:~~

- A detailed description of the systems at risk, their control and command circuits, and their associated ground equipment. This description also includes the component parts of the systems and the reliability data needed to assess the level of risk;

- The planned frequency plan for transmitters and receivers, together with emission characteristics (spectrum, power, modulation, coding, etc.);

- Sizing notes for the project's high-risk systems and equipment in accordance with appropriate engineering methods;
- Any specific study or calculation note enabling the characteristics of systems at risk to be assessed;
- Complete identification of risks and studies demonstrating their minimization.
- Preliminary risk analysis, even if only partial
- Qualification plans ~~for major components~~ of systems at risk cover all phases of the payload's life on the ground. For payloads arriving at the CSG after launch, qualification of at-risk systems must also cover the in-flight phases.
- In the case of reused components, the plan for maintenance, repairs and post-flight acceptance tests to be carried out before each risky activity or reuse.

Phase 2 - Qualification

The qualification file must ~~include at least:~~

- The results of qualification tests, whether partial or global, for systems at risk;
- The plan for partial or overall acceptance testing of hazardous systems;
- Any specific study or calculation note enabling the characteristics of systems at risk to be assessed (in particular fracture analysis);
- The document defining the interfaces between the payload and associated equipment and the various CSG facilities;
- An additional risk analysis and assessment of the risk level of the system and associated equipment to demonstrate that the safety objectives have been met;
- Where applicable, changes to the frequency plan and program characteristics.
- The system implementation operations plan and the associated risk activities also cover nominal and degraded cases for all phases of the payload's life on the ground.

Phase 3 - Implementation

The implementation phase begins no later than six months before launch, and is completed before the start of each risky activity. The start of this phase is deferred to 2 months before launch in the case of payloads that do not present risks with catastrophic consequences. The implementation file must include:

- Procedures for conducting activities, including procedures for safe recovery activities and emergency procedures in the event of an incident. These procedures must implement the following measures:
    - Identify high-risk activities;
    - Take into account the specific features of the CSG (sites, resources, names, etc.);
    - Specify, for each stage, the number and function of the people required in the danger zones;
    - Specify the means and products used;
    - Indicate the duration of all activities, including those required to restore safety, as well as any interruptions.
- The analysis of compliance with the requirements for safeguarding the launcher on the ground for the activities of configuring and returning payloads to safety in the launch zone;
- The results of acceptance tests on certain components of high-risk systems, in particular test certificates for gas pressure equipment. These documents can be supplied when the equipment arrives within the CSG perimeter;
- Authorizations for the possession and use of equipment subject to administrative authorization (e.g. objects emitting ionizing radiation);
- Certificates of medical fitness for personnel working on certain high-risk systems, in particular those emitting ionizing radiation or containing toxic products. These documents can be provided on arrival of these systems within the CSG perimeter;
- Authorization certificates for personnel handling pyrotechnic products;

- The final version of the satellite operations plan, including in particular the final list of procedures, the operations sheets and the operations schedule.

For controlled re-entry on site:

- A status report on safety barriers and equipment in orbit before the irreversible phase;
- Report on the status of high-risk systems, in particular barriers and interceptions, before each high-risk activity or reuse;
- Post-flight acceptance test reports for reused components, justifying a level of safety equivalent to that of ground commissioning and its reintegration for another flight.

ARTICLE 31 – LAUNCHERS ON GROUND

The launch operator, or any person responsible for the design or development of the launcher, in particular the contracting authority, submits to the President of the Centre national d'études spatiales the file provided for under Article 26 of this Order, which includes proof of compliance with the provisions of this Article and the rules applicable to launch vehicles provided for in CHAPTER V.1 and CHAPTER V.3 of this Order.

In the case of a launcher element making a controlled re-entry on site, after a launch operation, the operator will provide guarantees of its safekeeping until its departure from the CSG or before operations to reintegrate it on another launch. Reusable launcher components and their implementation on the ground are subject to the present safety submission process.

Phase 0 - Feasibility

The feasibility file must include:

- Project specifications;
- A description of the technical choices and solutions envisaged for the project;
- The list of systems at risk and their preliminary description;
- Safety target allocations;
- An initial quantitative assessment of the risk levels of the various technical design options considered;
- Preliminary analysis of the risks associated with project design and implementation, identifying system-level risks, circumstances and potentially risky events;
- Identification of critical aspects with regard to the safety of people and property and the protection of public health and the environment;
- Risk prevention principles to be applied;
    - List of applicable legislation, regulations, standards and specifications.

Phase 1 - Design

The design file must include:

- Evaluating design choices;
- Identification of risks and preliminary studies demonstrating their minimization;
- Qualification rules applicable to systems at risk and in particular to safety chains;
- Qualification plans for systems classified as at-risk, covering all phases of the launcher's life cycle.
    - In the case of reused components, the plan for maintenance, repairs and post-flight acceptance tests to be carried out before each risky activity or reuse.

Phase 2 - Realization / qualification

The production/qualification file must include:

- An additional risk analysis and assessment of the risk level of the system and associated equipment to demonstrate that the safety objectives have been met;
- Management of critical parameters;
- Assessment of qualification results for equipment classified as hazardous;
- The system implementation operations plan and the associated risk activities covering nominal and degraded cases for all phases of the launcher's life on the ground.

Phase 3 - Implementation

The implementation file must include:

- The list of system control and implementation activities, which must cover all stages:
    - From preparation to launch
    - Safety remediation, passivation and decontamination
    - Maintenance, repairs and post-flight acceptance testing of reusable components,
    - Or of the test for test specimens, from the removal of risk components from storage to the start or end of the test.
    - As well as refurbishment of the launch assembly or test stand;

- Final operation plans. In the case of reusable elements: plans for finalized operations to restore safety, passivate, decontaminate, maintain, repair and revalidate the elements;
- Implementation procedures covering nominal and degraded situations.
- The status report on risky systems, and in particular on barriers and interceptions for elements returning to Earth after a flight phase, before each risky activity or reuse.
- ~~Certificates of revalidation of at-risk elements before each reuse or at-risk activity.~~
- Post-flight acceptance test reports for reused components, justifying a level of safety equivalent to that of the ground service, and their reintegration for another flight.

The Chairman of the Centre national d'études spatiales may request the following documents:

- Implementation specifications for the launcher and its stages or the test specimen;
- Acceptance reports for all equipment and test certificates for pressure vessels;
- Authorizations for the possession and use of equipment subject to administrative authorization under the relevant regulations (e.g. objects emitting ionizing radiation).

The launch operator submits to the President of the Centre National d'Etudes Spatiales the final document setting out standard activity procedures and standard operating plans.

Any modification of a standard procedure into a specific procedure must be approved by the safeguard entity before submission to the President of the Centre national d'études spatiales.

ARTICLE 32 – FLIGHT SAFETY

The launch operator, or any person responsible for the design or development of the ~~launch~~ vehicle, in particular the prime contractor:

- Submits to the President of the Centre national d'études spatiales the file provided for under Article 26 of this Order, which includes proof of compliance with the provisions of this Article and with the rules applicable to ~~launch~~ vehicle ~~launchers~~ provided for in PART VI of this Order, in particular with regard to equipment contributing to safety, the planned trajectory of the launch vehicle ~~launcher~~, data on the adjustment of equipment and algorithms contributing to safety, or any other data deemed relevant by the President of the CNES.

- Provides all the information, data and technical facts required to carry out its duties under the present decree, as defined in 1'- Article 63 - and in - Article 64- of the present decree.

The safety submission process set out in this order, makes it possible to respond to the overall requirements of the Danger Study requested by the technical regulation and to apply them in a specific way.

ARTICLE 32.1 - FEASIBILITY, DESIGN AND PRODUCTION PHASES

The launch operator or any person responsible for the design or development of the launcher, in particular the prime contractor, submits to the president of the Centre national d'études spatiales a file including:

- the list of at-risk systems - equipment or functions - involved in the safeguarding and intervention missions defined in - Article 63 and Article 64 of this decree;
- The configuration of the missions envisaged: **launch** vehicle version, mission types, trajectories and associated ground resources, in terms of safety.

~~- its methods~~ and approaches safeguarding its responsibility, contributing to the safety of people and property and the protection of public health and the environment;
- the design and production of systems contributing to the ~~ground/airborne system~~'s flight safety missions~~,~~ in accordance with the provisions of PART VI of this order.

ARTICLE 32.2 - ~~FLIGHT~~ PREPARATION PHASES FOR LAUNCH AND CONTROLLED RE-ENTRY ON SITE IF ANY

The launch operator or any person responsible for the design or development of the launch vehicle, in particular the prime contractor, submits to the president of the Centre national d'études spatiales a file including:

- Mission configuration (**launch** vehicle version, mission type, trajectory and associated ground resources) in terms of safety;
- The information and data required to implement the applicable safeguard rules and calculations;
- Information and data attesting to the proper operation of the on-board safety system ~~(on-board/ground);~~
- Information and data enabling verification of the declaration of reservation of areas for nominal stage deposition or controlled re-entry of stages or orbital modules on site in ~~preparation for launch~~, for the benefit of air and sea users.

ARTICLE 32.3 - LAUNCH, DISPOSAL AND CONTROLLED RETURN TO SITE (IF ANY) PHASES

The launch operator submits to the President of the Centre national d'études spatiales a file including:

- The information and data required to implement the applicable safeguard rules and calculations;
- Information and data enabling control of the risks generated on the ground and in the atmosphere by the launch vehicle;
- Information and data enabling the preparation and transmission of information relating to the area of fallout of dangerous elements or products, within the framework of emergency plans.

PART V. GROUND SAFETY RULES

CHAPTER V.1 COMMON RULES

ARTICLE 33 - GENERAL GROUND PROTECTION RULES

The rules set out in this PART V apply to risk control for activities carried out on the ground, on *ground installations*, the *launcher* and *payloads, with the* exception of activities carried out on the ground during the flight of the ~~space~~ launch vehicle, which are covered by PART VI of this order.

In order to ensure the safety of people and property and the protection of public health and the environment, the design, construction and implementation of ground and on-board systems classified as hazardous in accordance with Article 21 of this order are based on:

- The reliability of said systems and compliance with safety coefficients satisfying operating safety specifications and safeguard requirements;
- The installation of security barriers, interceptions available to the safeguarding entity on the installation concerned, visualization or status reports of interceptions, enabling the configuration of systems at risk to be controlled;
- Implementing procedures, remote controls and automatic systems to limit the number of people exposed;
- Ensuring the safety of those exposed to the risks by providing them with individual protection appropriate to the risks involved.

ARTICLE 34 - ORGANIZATION OF ACTIVITIES

On each of the facilities located within the CSG perimeter, the organization of ground activities during production, launch or test campaigns must include a *safeguarding entity*.

The back-up function is guaranteed at all times thanks to an on-call system and constant monitoring of security alarms.

All persons referred to in article R331-10 of the French Research Code (Code de la recherche) ~~and article 14-7 of the above-mentioned decree relating to the CNES shall~~ forward to the President of the Centre national d'études spatiales the operational and safety organization they have set up.

On a site (building, platform, workstation, etc.) where a risky activity is taking place, this is clearly indicated to people outside the activity.

The President of the Centre national d'études spatiales is notified of the nature, location and start and end times of any activity whose risks extend beyond the establishment's perimeter.

ARTICLE 35 - ACTIVITY MANAGEMENT PROCEDURES

All action or intervention processes relating to the safety of persons and property and the protection of public health and the environment implemented by the persons referred to in article R331-10 of the French Research Code ~~14-7 of the aforementioned CNES decree~~ are formalized in writing in the form of:

- Nominal and degraded case procedures;

- Safety instructions;
- Documents setting out what to do in the event of an incident or accident.

Procedures are designed to be reversible, i.e. to ensure that at a certain number of key points during the activity, it is possible to return to a situation where the system concerned is safe.

Procedures for conducting high-risk activities are approved by the establishment's safeguard entity and submitted to the President of the Centre national d'études spatiales for activities whose risks extend beyond the establishment's perimeter.

Before a system is put into an at-risk configuration, the safeguarding entity is informed that the configuration has been checked and that the system's circuits are operating correctly.

Article 36 - Tasks and resources of the safeguard entity

A high-risk activity can only begin once it has been approved by *the facility's safety department*. To this end, the entity verifies that the means and conditions necessary for the safe conduct of the operation, such as *fire protection*, guarding, meteorological surveillance, the alerting of medical resources, the presence on site of a representative of the safeguarding entity, the evacuation of a particular area or compatibility with parallel activities, have been met.

All *safeguarding entities* must have the technical means necessary to supervise activities at risk, and in particular:

- Video equipment to monitor site activities;
- Communication resources to maintain contact with the personnel concerned, and to ensure the collection and dissemination of information or alerts, in liaison with the President of the Centre national d'études spatiales.

Any representative of *the safeguarding entity* may attend field activities on his or her own initiative, in compliance with the safety studies drawn up within the framework of the applicable regulations.

Article 37 - Faults, incidents or accidents

For all anomalies, incidents or accidents occurring on a system or element at risk, and all events with serious or catastrophic consequences occurring during activities at risk, particularly during a campaign or launch sequence, any person referred to in article R331-10 of the French Research Code ~~14-7 of the aforementioned CNES decree~~:

- Takes the necessary emergency measures, such as alerting emergency services and restoring safety to installations;
- Ensures that any such anomalies, incidents or accidents are immediately reported to its safeguarding entity;
- Immediately inform the President of the Centre national d'études spatiales of any such anomalies, incidents or accidents;
- Ensures that these anomalies are the subject of a technical instruction to identify their causes and define corrective actions.

After the above-mentioned technical instruction, the lessons learned in terms of safety and the measures adopted are brought to the attention of the safeguarding entity and the President of the Centre national d'études spatiales.

Article 38 - Safety barriers

1. Safety barriers are required for hazardous circuits or systems that can be activated unintentionally, either by equipment failure or human error. The minimum number of barriers required depends on the severity of the event:

- three barriers for an event with catastrophic consequences;
- two for an event with serious consequences.

For circuits or systems at risk, the device located on the circuit or system, which controls the passage of the signal (fluid, current or optical signal), is considered a barrier.

2. Barriers to the same hazardous event are independent and, if possible, of different types. They may be mechanical, electrical or software-based, or they may be procedural when physical barriers are technologically impossible.

3. Barrier implementation procedures are designed to ensure that several barriers in the same circuit or system are not raised simultaneously.

ARTICLE 39 - INTERCEPTION

For circuits or systems whose risks have catastrophic consequences as defined in!'-Article 21 - of this decree, the safeguarding entity of the establishment concerned must have:

- on the one hand, of the control of one of the barriers or of the prohibition of its lifting;
- the condition report for the barrier concerned.

This ~~barrier is~~ called "interception". It must not be technically possible to bypass ~~it~~. An absence of energy in the interception circuits must not cause the state of the system or circuit to change. Once the interception has been lifted and the command executed, resetting the interception must have no effect on the circuit or system in question.

ARTICLE 40 - PYROTECHNIC SYSTEMS

1. The components of pyrotechnic systems, as well as pyrotechnic materials, if they are exposed during nominal activity or if the structure of the object containing them does not provide protection, are selected on the basis of their low sensitivity to external stresses of thermal (hot spot, fire), mechanical (fall, shock, impact, friction, vibration), electrical (static electricity, lightning, electromagnetic emission)~~,~~ chemical (chemical compatibility) and optical origin.

To carry out a function, the launch operator or payload manufacturer ensures that he has chosen the pyrotechnic object or material presenting the least danger when subjected to external aggression.

2. Any solid propellant motor constituting the propulsion system of a launcher stage is designed and implemented in such a way as to prevent any risk of uncontrolled take-off for all phases of the motor's life: production, storage, transport, testing, integration on the launch vehicle, up to the latest in the launch chronology.

Edge or floor anti-theft devices are preferably passive safety barriers.

3. Electro-pyrotechnic initiators (igniters, fuse-detonators) must provide a level of safety at least equivalent to that of type 1 A, 1 W, 5 mn non-fire.

4. In addition to the special design rules for electrical systems defined in Article 41 of this order, the electrical circuits of pyrotechnic systems are designed to limit the induced current on the firing circuit to at least 20 dB below the maximum non-firing current, when exposed to an electromagnetic field defined by the electromagnetic environment generated by ground resources, the launcher and payloads.

If a filter is added to the circuit, it is mounted as close as possible to the initiator to be protected, and the portion of the circuit between the filter and the initiator is shielded.

The components can withstand a discharge of:

- 25,000 V supplied by a 470 to 500 pF capacitor through a 5,000 n pure resistor, the voltage being applied across the component;

- 25,000 V supplied by a 470 to 500 pF capacitor, with no resistor, the voltage being applied between the short-circuited terminals of the component and its case.

5. The power supply for the pyrotechnic system circuits is preferably a DC source.

If this is not the case, the power supply must comply with the electromagnetic compatibility requirements defined in Article 43 of this order.

6. The current delivered by the control equipment of electro-pyrotechnic devices is such as to prevent inadvertent ignition or flegmatization of the initiator. Control current is limited to at least 20 dB below the maximum non-fire current.

7. The plant's safety department ensures that the electrical control equipment is approved. A firing circuit must not be able to accumulate any electrostatic charge.

8. Electro-pyrotechnical components are in a safe configuration during storage, handling and after assembly, taking into account the possibility of external aggression. Their connection is preceded by a voltage-free check.

9. Radio silence periods are indicated in the procedures.

10. The installation of electric detonators and/or the connection of electro-pyrotechnic chains classified as hazardous must take place as late as possible in the launcher or payload preparation sequence. As soon as the pyrotechnic chains are connected, the plant's safety department must be able to check their status.

The removal of detonators and/or the disconnection of pyrotechnic chains classified as hazardous must be carried out as early as possible in the launcher's operating sequence, after a controlled re-entry phase on site.

11. In addition to the provisions contained in the safety data sheets for pyrotechnic articles and materials, the following is specified:

- Classification of pyrotechnic hazards in the workplace;

- The results of safety tests against mechanical (impact, fall, friction, vibration), thermal (hot spot, fire), electrical (static electricity, electromagnetic emission, lightning), chemical (chemical compatibility) and optical stresses to which the components o f pyrotechnic systems and the pyrotechnic materials in question may be subjected during all their life phases at CSG;

- Pyrotechnic effects expected in nominal operating mode and in degraded mode when subjected to external aggression.

12. Pyrotechnic objects that are unused or have reached their expiration date are recovered by their owner and then destroyed. The destruction procedure is submitted to the President of the Centre national d'études spatiales.

ARTICLE 40.1 - SPECIAL CASE OF OPTO-PYROTECHNIC IGNITION SYSTEMS

1. Opto-pyrotechnic initiators must provide a level of safety at least equivalent to that of "135 mW continuous" (5 min non-fire) (optical power) or 0.78 mJ pulsed or "non-fire" optical energy.

2. The optical power and energy delivered by the opto-pyrotechnic device control equipment are such as to prevent inadvertent ignition or flegmatization of the initiator. In the case of an ignition chain without a safety barrier downstream of the controlled initiator, optical control power and energy are limited to at least 40 dB below the no-fire signal.

3. In the case of an ignition chain with a safety barrier downstream of the controlled initiator, the control power and optical energy are limited to at least 20 dB below the no-fire signal.

4. The plant's safeguarding entity ensures that the optical control equipment is approved.

5. The opto-pyrotechnic elements are in a safe configuration during storage, handling and after assembly, taking particular account of the possibility of external aggression.
Before connecting them, check that the laser source is voltage-free, and that there are no other laser sources likely to damage the optical line.

6. The optical firing equipment and the opto-pyrotechnic detonator must remain uncoupled as late as possible (regardless of barriers) in the launcher or payload preparation sequence. As soon as they are connected, the plant's safeguarding entity must have access to check the status of the opto-pyrotechnic chains.

ARTICLE 41 - ELECTRICAL SYSTEMS

1. Electrical systems, even those complying with French regulations, are considered as hazardous systems, without voltage, current or frequency limitation, when one of the following conditions is met:

- The electrical system activates systems or components containing one or more hazardous substances;
- In the event of failure(s), the electrical system may deliver energy (electrical, thermal, etc.) or effluents likely to cause direct damage (electrical effect) or indirect damage (effect on a hazardous system connected to the electrical system).

2. Electrical systems at risk are protected against overcurrent’s and transient over voltages.

3. Equipment is designed so that external metal parts and shields can be earthed.

4. The following rules apply *to cables*:

- Cables must be resistant and protected against abrasion and twisting;
- Cables are selected according to criteria of fire resistance, smoke generation and compatibility with surrounding fluids;
- Cable shields must not be used as grounding conductors or as signal lines (except for coaxial cables in the latter case);
- Conductors for electrical circuits at risk must not be routed in the same cables or passages as those used for other circuits;
- Redundant links must be routed in different cables and passages;
- Structures must be free of sharp edges in cable installation areas, to avoid the risk of injury to cables.

5. The following rules apply to *connectors* for systems at risk:

- Connectors are designed to ensure unambiguous connection (mechanical coding of connectors). Colour coding can be used, but does not replace mechanical keying;
- Connectors are appropriately guided when plugged in, so that female and male contacts are not subjected to any stress during mating or unmating;

- The connectors are guided and held in such a way that they do not transmit any stress to the contacts that could affect their operation;
- The connectors have female contacts on the power source side and male contacts on the load side;
- Damage to a connection (crushing of the connector or contact between two adjacent pins) must not lead to catastrophic or serious events;
- Connectors used for circuits at risk must be lockable;
- The position of the pins must be such as to avoid any risk of short-circuit between two pins and between a pin and the plug; conductors in circuits at risk must have specific connectors and sockets, which can under no circumstances be shared with other circuits.

6. The following rules apply to *batteries*:

- Batteries must be easy to disconnect
- If the battery is not connected, the connection terminals are protected against short-circuiting.
- In the event of a short-circuit, ~~electrolyte splashes~~, all effects are controlled
- Results of safety tests (drop, overload, internal and external short-circuit, etc.) must be supplied.

ARTICLE 42 - STATIC ELECTRICITY

1. Electrical systems at risk, as well as electrical systems contributing to the safety or maintenance of installations in safe condition, are designed to be insensitive to electrostatic discharge.

2. A material is considered electrostatically conductive when its volume electrical resistivity is less than 10^8 Ohm.

3. Systems in which static electricity may present a risk with serious or catastrophic consequences within the meaning of Article 21 of the present decree are designed and built in such a way as to limit the creation and accumulation of electrostatic charges through the use of conductive materials.

4. The fixed or mobile conductive elements (metallic or non-metallic) making up these systems are interconnected by equipotential bonds and connected to earth. These connections are subject to electrical testing.

5. The various elements of the payload, launcher and associated equipment, as well as the ground installations, must not accumulate electrostatic charges during integration or transfer.

6. The use of personal protective equipment to prevent the build-up of electrostatic charges is mandatory when handling objects or explosive materials sensitive to electrostatic discharge. Such protection may take the form of conductive footwear or strips combined with conductive flooring, conductive wristbands or conductive work clothing.

They are built, used, maintained and inspected in accordance with best practice.

ARTICLE 43 - ELECTRO-MAGNETIC COMPATIBILITY (EMC)

1. Launchers, payloads, ground installations and associated equipment are designed to ensure electromagnetic compatibility between the various electrical installations and equipment.

2. The rules of the trade are respected, in particular those relating to:

- The creation of meshed networks or interconnected ground planes, connected to earth;
- Equipotential bonding, with respect to high-frequency currents, electrical grounds, metal grounds of equipment, shields and screens;
- Wiring and routing of power and communications cables;

- Electrical continuity of cable trays and metal trunking, between different frames, at wall penetrations and with the equipment served;
- Separating disruptive high-current components from sensitive low-current components;
- Electrical continuity and shielding of cables/connectors, connectors/plugs and plugs/connected equipment.

The above provisions are implemented taking into account environmental constraints (corrosion in particular) and are checked when they are put into service, or if necessary after undergoing structural modification, and then periodically.

ARTICLE 44 - FLUID SYSTEMS

1. A circuit containing one or more *hazardous fluids* is considered a hazardous system.

A circuit containing one or more pressurized fluids and complying with French regulations on pressurized equipment is considered a high-risk system if at least one of the fluids is a hazardous fluid.

2. Hazardous circuits are designed so that:

- Incompatible fluids cannot be mixed;
- Connections are mechanically identified (fitting, length) whenever there is a risk of assembly error or when the component is specific to a given fluid;
- The lubricants and materials used are compatible with the fluids concerned (chemical, thermal, mechanical aggression, etc.);
- Any retention is impossible, with the exception of elements whose function requires retention (filters, vapour traps, etc.).

3. Systems receiving *hazardous fluids* must systematically undergo a leak test at least the maximum expected pressure before filling, in the presence of personnel. For systems which have undergone a flight phase, this test must be carried out before any hazardous activity.

4. The fluid system components or equipment to be checked before each campaign must be included in a revalidation plan.

5. All conductive parts, metallic or non-metallic, fixed or mobile, of tanks, transfer circuits and associated components (valves, filters, etc.) are interconnected by equipotential bonding and earthed before and during any fluid transfer.

ARTICLE 45 - MECHANICAL AND ELECTROMECHANICAL SYSTEMS

Mechanical and electromechanical systems used in high-risk activities are subject to an operating safety study.

ARTICLE 46 - CONFINED ATMOSPHERE

1. Rooms with a confined atmosphere are marked in accordance with labour legislation.

2. Before entering a confined-atmosphere zone, personnel must familiarize themselves with and apply the specific safety instructions setting out the procedures to be followed to prevent the risk of anoxia, in accordance with the conditions defined in Article 8 of this order.

3. All personnel must be provided with a breathing air mask, or a tight-fitting suit supplied with breathing air, when entering a room that is difficult to evacuate. The room is ventilated at all times, and an outside supervisor is present throughout the activity.

4. Before personnel enter a confined area, the oxygen level is checked.

5. Any work in a confined atmosphere where there is a risk of under-oxygenation requires the presence of at least two independent detectors, one of which must be fixed, each fitted with a low alarm, and continuously monitoring the atmosphere. The low alarm level to be taken into account for detection is 19% oxygen (percentage by volume).

6. In the particular case of ground installations, any room at risk of under-oxygenation is fitted with a fixed oxygen content detection system equipped with a remote alarm as well as a local audible and visual alarm.

7. When people need to enter confined-atmosphere installations that are not normally accessible, the safeguarding entity conducts a safety analysis to take account of the above rules.

Article 47 - Breathing air circuits

Breathing air circuits are designed to avoid contamination. To this end, moving connections and fittings are mechanically keyed (fittings, lengths).

Article 48 - Toxic atmospheres

1. Premises or facilities with toxic atmospheres are signposted.

2. Before entering an area where there is a risk of inhalation of toxic products, personnel must familiarize themselves with and apply the special safety instructions laying down the procedures to be followed to prevent the risk of inhalation of toxic products, in accordance with the conditions defined in Article 8 of this order.

3. Any work in a zone with a toxic risk atmosphere requires the presence of a detector permanently monitoring the atmosphere, equipped with an alarm.

4. In the specific case of ground installations, any room with a toxic atmosphere is equipped with a fixed toxic vapour/gas content detection system with an alarm designed in accordance with the provisions of Article 52 of the present order, as well as a local audible and luminous alarm.

5. For any activity involving toxic fluids, toxicity measurements are carried out before, during and after the activity.

6. All detectors are set to trigger an alarm when the concentration of a toxic substance in the workplace atmosphere exceeds 90% of the short-term limit value (STLV). If the STLV of a toxic substance is not defined, the alarm is set at 90% of its 8-hour Occupational Expos**ure** Limit Value (8-hour OELV).

7. All personnel must have at their disposal a mask with a filter cartridge adapted to the various risks considered, or a watertight suit supplied with breathable air depending on the risks generated by the activity, in ~~accordance with the table below:~~

8. Work or activities requiring the venting of components which have contained toxic fluids must be preceded by their draining, and workers must be protected if the components have not been decontaminated.

9. Each voluntary release of toxic effluents, whether liquid or gaseous, must be approved by *the* facility's *safeguarding entity*, which verifies that the release complies with legislation on facilities classified for environmental protection.

10. Limitations on personnel access to hazardous areas and the use of remote controls are defined according to the aggressiveness of hazardous fluids and the risks they generate.

~~Type of activity~~	~~Personal protective equipment~~

~~Presence in a room with a toxic atmosphere or activity in an area where toxic fluids are stored~~	~~Acid-proof suit and cartridge filter mask slung over the shoulder.~~
~~Toxic activities on network polluted by a fluid~~	~~Acid-proof suit and breathing air mask, plus splash protection if necessary.~~
~~Propellant transfer and filling activities, activities on systems containing pressurized toxic fluids~~	~~Waterproof suit resistant to toxic fluid from splashes, supplied with breathable air~~

11. All work or activities requiring the venting of components which have contained toxic fluids must be preceded by their draining, and workers must be protected if the components have not been decontaminated.

12. Each voluntary release of toxic effluents, whether liquid or gaseous, must be approved by the facility's safeguarding entity, which will verify that the release complies with legislation on facilities classified for environmental protection.

13. Limitations on personnel access to hazardous areas and the use of remote controls are defined according to the aggressiveness of hazardous fluids and the risks they generate.

ARTICLE 49 - EXPLOSIVE ATMOSPHERE

In the case of systems containing flammable and toxic fluids, plant and equipment must not generate an explosive atmosphere outside the system during normal operation.

This requirement can be adapted for outdoor degassing.

ARTICLE 50 - RADIONUCLIDES

In addition to the provisions concerning the transport of dangerous goods set out in Article 15 of this decree, any holder or user of radionuclides within the meaning of the relevant provisions of the French Public Health Code, in the form of a radioactive source, or products or devices containing them, must send the President of the Centre national d'études spatiales a copy of the authorization files for possession and use, together with the names and contact details of the persons responsible for radiation protection (PCR).

ARTICLE 51 - LASER RADIATION SYSTEMS

1. Any owner or user of laser radiation systems with a risk of serious or catastrophic consequences within the meaning of Article 21 of the present decree *shall forward to the President of the Centre national d'études spatiales* a file describing the said device, including its classification and associated risks, as well as the location and configuration of its use and storage.

2. In the case of an opto-pyrotechnical system, the following rules apply to *optical harnesses*:

- Cables must be resistant and protected against abrasion and twisting;

- Cables are selected according to criteria of fire resistance, smoke generation and compatibility with surrounding fluids;
- Redundant links must be routed in different cables and passages;
- Structures must be free of sharp edges in cable installation areas, to avoid the risk of injury to cables.
- The rules of the art in optical cabling, such as respecting a suitable bending radius and the absence of sharp angles or bends, must be respected.
- Conductors for high-risk circuits must be fitted with specific connectors and sockets, and must never be shared with other circuits.

3. The following rules apply *to connectors* for systems at risk:

- Connectors are designed to ensure unambiguous connection (mechanical coding of connectors). Colour coding can be used, but does not replace mechanical keying;
- Connectors are appropriately guided when plugged in, so that female and male contacts are not subjected to stress during mating and unmating;
- The connectors are guided and held in such a way that they do not transmit any stress to the contacts that could affect their operation;
- Connectors used for circuits at risk must be lockable;

CHAPTER V.2 SPECIFIC RULES FOR GROUND INSTALLATIONS AND ASSOCIATED EQUIPMENT

ARTICLE 52 - ALARM AND SECURITY SYSTEMS

1. Alarm and security systems are subject to operational safety studies justifying compliance with the requirements of!'-Article 22- of the present order.

2. Their failure is signalled by an alarm.

3. Safety alarms from fixed detectors (fire, **gas** and toxic vapours) are reported to *the safeguarding unit* and to the CSG fire department rescue centers.

ARTICLE 53 - ELECTRICAL SYSTEMS

1. All electrical systems for ground equipment associated with launchers and payloads must be equipped with an emergency power cut-out enabling all active conductors to be cut off on load in a single operation.

2. Emergency switches are easily accessible and recognizable.

3. Safety systems are analysed in detail to identify which systems need to be kept active in the event of an emergency shutdown.

4. Emergency lighting is provided inside a room where a hazardous activity is taking place, to ensure the safety of the activity in progress.

5. Battery storage and charging rooms are sufficiently ventilated to ensure that the concentration of vapours emitted is less than 25% of the lower explosive limit (LEL). These premises must be equipped with fixed detectors for measuring the concentration of vapours emitted, and an associated alarm system(s).

ARTICLE 54 - ELECTROMAGNETIC COMPATIBILITY (EMC)

Electrical systems at risk, and electrical systems used for safety or to maintain installations in safe condition, are insensitive to radiated electromagnetic emissions (radar, lightning, radio communication, telephone) and to emissions conducted by the various high-current, low-current and other conductive networks (e.g. fluids).

ARTICLE 55 - CIRCUITS CONTAINING HAZARDOUS FLUIDS

In addition to the general provisions of Article 44, the following rules apply.

1. Remote-controlled circuits containing hazardous fluids must be fitted with valves which automatically switch to safety position (either open or closed) in the event of a loss of energy (electrical, hydraulic, pneumatic, etc.).

2. Fluid circuits (cryogenic, corrosive, flammable) that could damage electrical equipment are designed so that any leakage is not likely to damage control-command electrical lines to the point of generating a risk with serious or catastrophic consequences as defined in Article 21 of this order.

3. Storage tanks for hazardous fluids are fitted with distribution circuit isolation valves which can be operated under the maximum pressure and flow conditions possible by design.

4. For mobile devices (especially go-karts), the vents of valves and pressurizing devices for toxic or flammable fluids are designed to be collected and connected to the vents of fixed installations.

ARTICLE 56 - LIGHTNING PROTECTION

1. The provisions relating to lightning protection laid down in the legislation on classified installations for environmental protection apply to the ground-launch vehicle in all its phases of operation.

2. This lightning protection is preferably provided by passive protection means, and failing that, by active protection means. In the latter case, this protection is compatible with CNES/CSG's weather forecasting and lightning protection capabilities.

CHAPTER V.3 GROUND RULES SPECIFIC TO LAUNCHERS AND PAYLOADS

ARTICLE 57 - ON-BOARD ELECTRICAL SYSTEMS

1. An on-board electrical system is considered to be at risk if it can deliver a contact current that can cause electric shock and burns, with an intensity greater than or equal to:

- 3.5 mA for DC and AC currents up to a frequency of 1O kHz;
- 350*f mA (f being the frequency expressed in MHz) for alternating currents with frequencies ranging from 10 kHz to 100 kHz;
- 35 mA for alternating currents above 100 kHz.

2. Prior to any transfer of the launcher or payload, electrical circuits classified as hazardous are inspected and kept safe for the duration of the transfer.

3. The umbilical connections of electrical circuits è at risk are checked before connection to the payload.

ARTICLE 58 - RISK CLASSIFICATION CRITERIA FOR ON-BOARD FLUID SYSTEMS

On-board pressurized fluid systems are considered to be at risk if the dimensions and operating pressures of each of the separate components (container or piping) are as follows:

Type of fluid	Container (capacity)	Piping
GASES or liquids whose vapour pressure at maximum permissible temperature is 0.5 bar higher than normal atmospheric pressure.	P > 0.5 bar And V > 1 L And PxV > 50 bar x L Or P > 1000 bar	P > 0.5 bar And DN > 32 mm And PxDN > 1000 bar x mm
LIQUIDS whose vapour pressure at maximum permissible temperature is less than or equal to 0.5 bar above normal atmospheric pressure.	P > 10 bar And PxV > 10000 bar x L Or P > 1000 bar	P > 10 bar And DN > 200 mm And PxDN > 5000 bar x mm

V : internal volume of container in litters
P : gauge pressure in bar
DN : nominal dimension in mm. - Numerical designation of the dimension common to all elements of a piping system other than those indicated by their outside diameter or thread size. It is a rounded number for reference purposes and has no strict relationship with manufacturing dimensions. Nominal size is indicated by DN followed by a number.

Organs are considered separate when a tear in one cannot spread to the other.

ARTICLE 59 - ON-BOARD PRESSURIZED FLUID SYSTEMS CLASSIFIED AS HAZARDOUS

On-board pressurized fluid systems classified as at risk within the meaning of articles 44 and 58 of the present decree comply with a recognized standard or at least with the requirements defined in article 44 of the present decree and the rules below.

1. The pressure capacities of on-board fluid systems are designed for pressure loads with a *rupture safety factor Jr of* at least 2. In special cases, this factor may be reduced to 1.5, depending on the possible failure modes demonstrated by studies and tests.

A type LBB pressurized capacity, used in the pressure range required to obtain LBB status, only generates a danger zone due to the possible leakage of the contained fluid. In this case, only the hazard associated with the fluid is taken into account when determining the danger zone.

Capacities must undergo a program of tests and trials to confirm their correct dimensioning and the quality of their construction.

2. On-board pressurized fluid systems and their components must have undergone the stamping tests described below before arriving at the CSG perimeter:

A stamping coefficient *Jt is* defined so that stamping pressure is achieved at *Jt* times the maximum pressure reached in the presence of personnel.

If the breaking safety coefficient Jr is greater than or equal to 2, *Jt* =1.5. If the breaking safety coefficient Jr is less than 2, Jt = $1.5.\frac{1+Jr}{2}$

If it is not possible, due to the design, to carry out this stamping test on the whole system, tests can be carried out on individual parts. The final assembly of the entire system is subject to appropriate quality measures to guarantee the mechanical strength of the assembly when put under pressure. Any deviation from the applicable quality procedures is justified and notified to the President of the Centre national d'études spatiales.

3. The stamping test configuration must not undergo any change or technical incident that could call into question its validity.

Once the system has been tested, the maximum expected operating pressure must never be exceeded.

Pressure vessels in service must not have been subjected to any stress (mechanical, thermal, electrical, etc.) likely to affect their characteristics.

In the event of repair or maintenance, a representative leak test is required prior to recommissioning. In addition, if the activity is not limited to disassembly/reassembly, but includes more extensive work (welding, forming, etc.}, the pressure system is inspected and tested.

4. Pressurization and depressurization rates must not create uncontrollable dangerous situations (temperature gradient, water hammer, etc.).

The relative pressure in millibar exerted on a component where manual intervention is taking place (disassembly, repair, tightening or loosening of fittings, etc.) is such that the product of this pressure and the cross-sectional area of the passage (expressed in cm^2) is less than 1000.

All assemblies containing pressurized fluids are of the "Safe-Life" type as defined in Article 1 of this order.

In the particular case of a system assembled by welding, the welds between the various parts are inspected after assembly using a non-destructive procedure recognized in the aerospace industry. Any discrepancies found during these checks are reported to the President of the Centre national d'études spatiales.

5. During *the dynamic pressurization* or *depressurization phases* and in the static phase, operational constraints are set by reference to the instantaneous safety coefficient Js defined as the ratio between the permissible pressure at rupture and the relative pressure reached at the instant in question by the system in question:

Js = Permissible pressure at rupture / Considered instantaneous relative pressure. This variable coefficient Js is also such that Js is greater than or equal to Jr.

Access to hazard zones generated by an on-board pressurized fluid system is subject to the following special rules:

Safety coefficient Js	Static phase access	Dynamic phase access (1)
Js ≥ 4	No constraints	No constraints
3 ≤ Js < 4	No constraints	Controlled access (2)
2(4) ≤ Js < 3	Controlled access (2)	Limited access (3)
Js < 2 (4)	Access forbidden	Access forbidden

(1) The dynamic phase includes the movement of fluids and the handling of pressurized capacities, but excludes the stages required for temperature equilibration after pressurization.

(2) Only people directly involved in activities for which their presence is essential are admitted. These activities may concern anything other than the capacity in question.

(3) Only people involved in the pressurization/depressurization activity are admitted, if the activity cannot be carried out remotely.

(4) In the special case of LBB pressure, the limit is 1.5.

6. On-board systems with pressurized fluids, classified as hazardous, returning to Earth after a flight phase.

The pressure values of the tanks and circuits must be made available by the operator in charge of returning the object, and monitored in real time by *the safeguarding unit* of the facility operating the landing site.

ARTICLE 60 - PYROTECHNIC SYSTEMS

1. Safety boxes refer to safety and arming boxes (SAB) for electro pyrotechnic systems and optical safety boxes for optopyrotechnic systems (OSB).

2. The external conductive parts (metallic or non-metallic) and the shielding of the components of a pyrotechnic chain, an initiator, a safety and arming box, transmission and distribution components and functional devices (destruction strips, cutting cords, fuses, valves, cylinders, etc.) are equipotential and earthed.

3. For pyrotechnic systems presenting a risk with catastrophic consequences within the meaning of Article 21 of the present order, the barrier near the source of risk must consist of a mechanical barrier (BSA or OSB) which must prevent the system from being accidentally ignited.

4. The safety and arming boxes or optical safety boxes are designed in such a way that:

- Once positioned in one of the "armed" or "disarmed" states, the barrier cannot leave this position in the absence of a command or under the effect of an external stress (shocks, vibrations, electrostatic phenomena, etc.) in a normal or accidental environment;
- The barrier is intercepted in accordance with the provisions of Article 39 of the present by-law;
- The positioning status report is representative of the actual "armed" or "disarmed" status and can be remoted;
- The "armed" or "disarmed" status is displayed by an indicator physically linked to the interception device;
- They can be controlled remotely, but manual disarming is still possible;
- Installation of the detonator (for the BSA) or the optical connection (for the BSO) is physically impossible if the box is not in the "disarmed" position.

5. The layout of safety boxes must allow easy access for mounting and connecting detonators or optical connections, and for manual disarming.

6. The safety boxes are in the safe position when personnel are present. It must be possible to check that the system is in the safe position.

PART VI. IN-FLIGHT SAFETY RULES

CHAPTER VI.1 GENERAL ~~FLIGHT~~ RULES

ARTICLE 61 - ~~DEFINITION AND DELIMITATION OF~~ ZONES AND ASSOCIATED LEVEL OF PROTECTION

Three geographical zones are defined for the exercise of the safeguard and intervention mission (MSI) defined in - Article 63 - of the present decree in the event of a nominal and accidental in-flight situation.

ARTICLE 61.1 DEFINITION OF ZONES AND CONTOURS

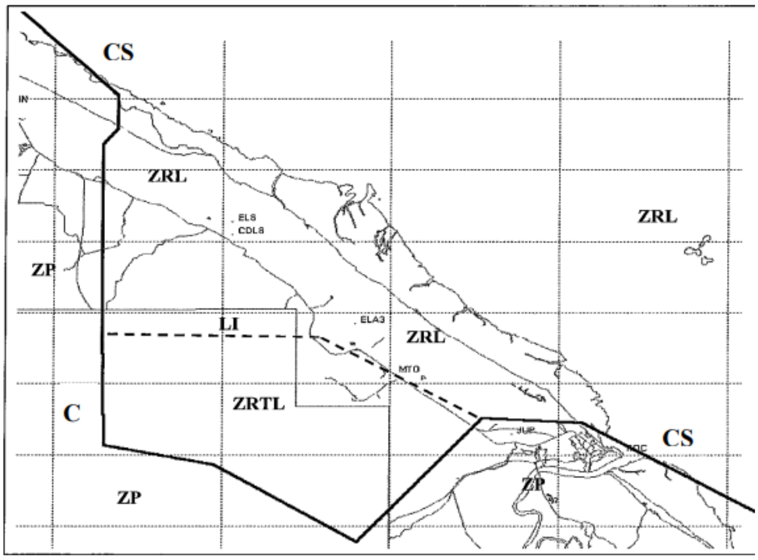
Zone à risques au lancement (ZRL): The launch hazard zone is defined as a land or sea area where the flight of a launch vehicle may, in a nominal or accidental situation, give rise to mechanical, thermal or toxic hazards as defined in Article 23 of this order.

Zone protégée (ZP): land and sea complement to the Launch Risk Zone (ZRL).

Zones à risque toxique au lancement (ZRTL): A ZRTL is a terrestrial zone, ~~a subset of~~ included in the Zone à risque au lancement (ZRL), exposed to toxic risks but protected from thermal and mechanical risks ~~(heavy fragments)~~ as defined in - Article 23- of this decree, generated by an accident involving the launch vehicle. A ZRTL is specific to a given type of mission for a given launch vehicle. *All ZRTLs are specified by regulatory instruction from the President of the Centre national d'études spatiales.*

Contour de Sauvegarde (CS) ~~*hazard limit*~~: The Contour de Sauvegarde ~~hazard limit~~ is the boundary between the ZP and the ZRL. ~~Beyond this boundary, the public in the PZ is not exposed to the risks defined in 1'-Article 23- of this decree.~~ *The geographical coordinates of the points defining ~~the hazard boundary of~~ the Contour de Sauvegarde are ~~specified in the appendix to the present order,~~ and are specified in a Regulatory Instruction issued by the President of the Centre national d'études spatiales.*

Limit d 'Impact (LI): The limit of impact is the boundary between the ZRL and the ZRTL. The geographical coordinates of the points defining the LI are specified by regulatory instruction from the President of the Centre national d'études spatiales.



ARTICLE 61.2 MEASURES W.R.T ZRL

~~Consequently,~~ the terrestrial part of the Launch Risk ~~Zone~~ is evacuated by the President of the Centre national d'études spatiales at the time of the launch sequence and any controlled re-entry to the site, without prejudice to any measures that may be taken by the Prefect, in particular under the aforementioned Decree no. 89-314 of May 16, 1989. However, certain buildings designed to withstand all the dreaded effects can house the personnel strictly necessary for the launch sequence.

ARTICLE 61.3 MEASURES W.R.T ZP

In the event of failure of the ~~launch~~ vehicle, the latter is neutralized so that the ~~probability of generating~~ risks with catastrophic or serious consequences in the Protected Zone, as defined in Article 23 of this decree, whether of a mechanical, thermal or toxic nature, is deemed negligible.

The negligible nature of the risk is ensured by:

- the qualitative and quantitative measures imposed on the safeguard system in the remainder of this decree,
- an assessment of toxic, thermal and mechanical nuisance zones, which are excluded from the ZP.

A probabilistic approach to the mechanical risks associated with light fragments in the presence of wind is possible. In this case, the categorization of light fragments, as well as the risk thresholds associated with the probabilistic approach, are specified by a Regulatory Instruction issued by the President of the Centre national d'études spatiales.

ARTICLE 61.4 MEASURES W.R.T ZRTL

In this zone, the presence of people is subject to the existence of special measures to protect against toxic effects or the fallout of light fragments carried by the wind.

However, in the event of serious danger, the President of the Centre national d'études spatiales may have the area evacuated in accordance with the provisions of Article 12 of this order.

ARTICLE 62 - DELIVERY OF THE FLIGHT CORRIDOR

~~The *flight* corridor is an area in which the launch vehicle follows a trajectory compatible with its mission. Outside this area, the launcher mission is considered lost, and the President of the Centre national d'études spatiales may decide to order the launch vehicle to be neutralized.~~

The *flight* corridor, ~~defined in accordance with article 17 of the technical regulations, and~~ the method used to obtain it, are supplied to the President of the Centre national d'études spatiales by the launch operator.

ARTICLE 62.1 CONTRIBUTION TO THE ESTABLISHMENT OF THE FREE EVOLUTION DOMAIN

All data required to establish the free evolution domain are transmitted to the President of the Centre National d'Etudes Spatiales.

ARTICLE 63 SAFETY AND INTERVENTION MISSION (MSI)

As part of his mission to safeguard space operations, the President of the Centre national d'études spatiales (CNES) is responsible ~~for~~ implementing a *safety system that* enables:

- assess the dangerous nature of the spacecraft in flight at all times
- intervene if necessary ~~at any time~~ to neutralize the launch vehicle outside the phases of overflight of foreign territorial lands and seas by its impact area;
. ~~check for areas of element fallout in nominal and degraded cases~~
- to know the status of the resources contributing to this mission.

ARTICLE 63.1 DURATION OF THE MSI

The mission to safeguard and intervene on a launch vehicle begins when the ~~launcher~~ it leaves the ground and comes to an end when ~~ends at the end of the intervention capability from the CSG, at the latest when~~ its impact area touches the territorial sea of the first State encountered outside French Guiana.

Note 1: in the case of a controlled re-entry of an orbited or non-orbited stage or orbital module, the MSI begins at the earliest on re-entry into the atmosphere, and ends when any re-entrant component is secured to the ground.
Note 2: the effective end of the MSI is determined on the basis of the hazard study and decided by the President of CNES;

ARTICLE 63.2 FLIGHT TERMINATION

The flight of any space vehicle must be able to be ~~voluntarily~~ interrupted from the ground by the President of the Centre national d'études spatiales during the exercise of the MSI, before flight conditions no longer ensure the safety of persons and property and the protection of public health and the environment.

To this end, the launch vehicle must be equipped with a flight safety system compatible with the *CSG flight safety resources* and complying with the requirements of the present order. The President of the Centre national d'études spatiales is responsible for deciding on and implementing flight termination.

In accordance with article 32 of the present order, the launch operator sends the President of the Centre national d'études spatiales all the necessary data, in particular that provided for in articles 16 to 19 of the technical regulations, to enable the preparation and implementation of the flight termination.

ARTICLE 63.3 FS/FS CRITERION

~~In the case of risks~~ With regard to risks with catastrophic consequences within the meaning of I '-Article 23- of the present order, the FS/FS criterion is applied as-follows: the first failure being the failure of the launch vehicle, a failure of the on-board safety ~~neutralization~~ system should not therefore lead to a risk with catastrophic consequences.
This implies, among other things, that all ground and on-board resources contributing to the application of safety ~~neutralization~~ measures must meet the "Fail Operational" (FO) criterion.
However, in the case of neutralization based on predictive intervention criteria as defined in Article 66 of the present decree, the launch operator must comply as far as possible with the FO criterion.

ARTICLE 64 - SURVEILLANCE AND AWARENESS MISSION (MSA)

~~In addition to his safeguard mission related to the realization of launches~~, the President of the Centre national d'études spatiales carries out a Mission de “Surveillance et d'Alerte” (MSA) implementing a safety system ~~consisting of~~:

- to monitor the flight of the launch vehicle launched from the CSG in order to check that it is operating correctly;
- in the event of launch vehicle failure, to transmit to the appropriate authorities, in particular to the Director of Rescue and the Minister in charge of Space, information concerning the area where the elements have landed, enabling rescue operations to be organized in French Guiana or the authorities of the countries concerned to be notified as soon as possible. This information is also transmitted to the launch operator.

ARTICLE 64.1 DURATION OF THE MSA

The monitoring and warning mission begins ~~at the end of the safeguard and intervention mission as defined in l'Article 63. of the present order,~~ at the moment when the launch vehicle leaves the ground, and ends after ~~the end of the~~ disposal-phase of the last stage of the launch-vehicle.

Note 1: When the disposal phase leads to immediate controlled re-entry into the zone or site, the surveillance and warning mission continues until evaluation of the landing zone or immobilization of the object on site.
Note 2: in the case of a spacecraft making a controlled re-entry after an orbital phase, the MSA begins as soon as controlled re-entry operations start on the object in question.

ARTICLE 64.2 QUALITATIVE REQUIREMENTS ASSOCIATED WITH SUBSYSTEMS IMPACTING OR CONTRIBUTING TO MSA

All ground and airborne resources contributing to the application of surveillance and warning measures must comply with the "Fail Operational" (FO) criterion.

If this is not possible, the President of the Centre National d'Etudes Spatiales will be provided with a file justifying compliance with the overall safety objective as mentioned in the principles of Article 24.

~~ARTICLE 65 - REQUIREMENTS COMMON TO THE SAFEGUARD AND INTERVENTION MISSION (MSI) AND THE surveillance and alert mission (MSA)~~

~~The launch operator provides the President of the Centre national d'études spatiales with the on-board resources and data required to carry out the MSI and MSA, enabling him to analyse:~~

- ~~the location of the launch vehicle;~~
- ~~the behaviour of the launch vehicle during take-off;~~
- ~~whether the theft is dangerous;~~
- ~~the state of the on-board intervention system;~~
- ~~the reaction of the on-board intervention device when activated;~~
- ~~the impacted area following an in-flight accident or activation of the on-board response system.~~

ARTICLE 66 - REQUIREMENTS SPECIFIC TO MSI

The launch operator transmits to the President of the Centre national d'études spatiales all data required **to** establish intervention criteria, in particular those provided for in articles 16 to 19 of the Technical Regulations.

Predictive intervention criteria (CIP) may be implemented by the President of the Centre national d'études spatiales from the ground, in particular on the basis of studies carried out under article 18 of the Technical Regulations, in order to neutralize the launch vehicle before overflight. ~~To this end, the launch operator provides the President of the Centre national d'études spatiales with all the necessary information~~.

~~In the near zone,~~ the analysis of physically realistic deviated trajectories, the occurrence of which could not be sufficiently mitigated by barriers or risk reduction measures, makes it possible to ~~voluntarily~~ ensure the neutralization of the launch vehicle in the interests of the safety of people and property, and the protection of public health and the environment.

~~At all times during the flight, the President of the Centre national d'études spatiales must be able, as part of his MSI, to neutralize the launch vehicle so that it cannot generate any mechanical, thermal or toxic risks in the protected area (ZP), as defined in Article 23 of this order.~~

CHAPTER VI.2 NEUTRALIZATION SYSTEM

ARTICLE 67- ~~OBJECTIVES~~ NEUTRALIZATION SYSTEM REQUIREMENTS

~~The neutralization system consists of an *on-board intervention device* remotely controlled from the ground.~~
The neutralization system includes an on-board device that triggers automatic neutralization in the event of launch vehicle failure.

~~On-board automatic systems can complement this system, but cannot replace it. They can only be used if the ground remote control system is unable to guarantee a sufficient link balance.~~

The launch operator must ensure that the on-board safety system is compatible with the *CNES/CSG* flight safety resources.

Note: In the case of a launch vehicle with one or more reusable components, each stage for which controlled re-entry on site is planned must also be equipped with its own neutralization system.

ARTICLE 67.1 EFFECTS OF THE NEUTRALIZATION SYSTEM

~~The launch operator ensures that the on-board elements of the neutralization system under his responsibility are capable of neutralizing the launch vehicle. This neutralization must enable a single command to be given from the ground, for all stages.~~
The main purpose of the neutralization system is to comply with article 61 of the present document.

To achieve this, activation of the neutralization system, from a single command, must lead to :
~~- ensure that the danger zone induced by the neutralization is compatible with the constraints linked to the various zones to be protected;~~
~~- minimize the impact on the environment;~~
- instantaneously stops the thrust of the active stage
- inhibit the ignition of any stage likely to propel;
- prevent any self-propulsion by any stage likely to operate in this mode.

In order to minimize the thermal, toxic and mechanical impact on the ground of all or part of the launch vehicle, it is recommended that activation of the neutralization system should :

- prevent the direct or indirect dispersion of toxic propellants, with or without combustion;
- prevent the detonation of solid or liquid propellants both at altitude and on impact with the ground;
- ~~prevent the fallout of fragments of a mass incompatible with the dimensions of the ground installations to be protected.~~

In all cases where these recommendations cannot be complied with, the launch operator must provide the CNES President with supporting evidence to ensure compliance with the constraints relating to the area to be protected (as defined in Article 61), and that the impact on the environment has been minimized~~.~~
Note: the neutralization of a stage undergoing controlled re-entry on site must impact only that stage, and not the rest of the launch vehicle, which continues its mission.

ARTICLE 68 - NEUTRALIZATION SYSTEM FUNCTIONS

Neutralization system functions

The launch operator ensures that the ~~*on-board*~~ neutralisation *system* is able to perform the following functions:

- commanded neutralization: a neutralization command, issued from the ground, causes the neutralization function to be executed ~~simultaneously on all floors~~. No on-board functional process must be able to inhibit or delay the execution of this function.

- instantaneous automatic neutralization: an on-board automatic device instantly commands the execution of the neutralization function for ~~all stages of~~ the entire launch vehicle when a non-nominal separation or stage rupture occurs~~, or in the event of drift with respect to specified conditions.~~ This function can also be used to reduce the risk of losing the *on-board safety system.*

- delayed automatic neutralization: an on-board automatic device commands the execution of the function with a specified delay to neutralize ~~a stage after nominal separation, without inducing any risk on the upper stages, before ground impact, and ensuring the dispersion of residual propellants~~, after nominal separation and before ground impact, a stage for which no return to site is planned. This neutralization must not induce any risk to the upper stages, and must ensure the dispersion of residual propellants and the sinking of the stages.

- Inhibition of the remote control receiving edge device: this remote control receiving edge device is inhibited at the end of the MSI.

ARTICLE 69 - NEUTRALIZATION SYSTEM DESIGN

The launch operator ensures that the components ~~of~~ the *neutralization system* under his responsibility comply with the following criteria:

- Tolerance to a single failure (FO) through redundancy and geographical segregation of ~~on-board safety chains within the~~ physical limits of the launch vehicle ~~(FO criterion)~~. A common mode cannot be excluded, but must not jeopardize the overall safety objective.
- These levels must ~~also be individually consistent with the launcher's~~ overall ~~safety objective and mission success objective. The required reliability levels are specified by regulatory instruction from the President of the Centre national d'études spatiales~~, and will be set during the feasibility phase of the safety submission process, and ratified via an IR.
- the neutralization safety functions ~~should preferably be~~ independent of the on-board functional unit. ~~If this is not~~ possible, and duly justified, any link (dialogue bus, electrical ground, sequential order, etc.) between equipment performing safety override functions and on-board function equipment must not delay or inhibit ~~(whatever the failure~~) the override function capabilities.

ARTICLE 70 - COMPONENTS OF THE NEUTRALIZATION SYSTEM ~~CHAIN~~

The ~~on-board~~ components of the neutralization system ~~chain~~ mentioned below are subject to the submission process defined in - Article 32 - of this order:

- actuators for acting on the launch vehicle (safety pyrotechnic chain, valves, etc.);
- control units may be either an on-board receiver of a signal emitted by the ground, or a specific on-board device
- power supplies to these components;
- power and communication circuits.

~~On-board safety chain of~~ the *neutralization systems* ~~are redundant and segregated (FO criterion), in accordance with the provisions of Article 63 of the present order~~. ~~They~~ are designed to withstand the stresses that may be encountered during the launch chronology~~,~~ the launch phase and any controlled re-entry phases on site.

Where it is impossible to comply with the segregation rule set out in Article 69, ~~above,~~ for certain existing systems and for new systems, a functional safety study must demonstrate that the safety objectives set out in Article 24 - of this decree are met.

When the override is triggered, the launch vehicle's components are guaranteed to operate at the required performance level, and the system must function under the most severe environmental conditions that could result from the launch vehicle's failure.

ARTICLE 71 - IMPLEMENTATION OF NEUTRALIZATION ~~CHAIN~~ SYSTEMS

The launch operator provides the President of the Centre national d'études spatiales with the information required to take into account and verify all the effects of an in-flight accident involving the launch vehicle, as well as ~~those resulting from the use of the neutralization system, whether due to~~ a failure of the launch vehicle or the use of the neutralization system.

To this end, the launch operator provides:
- neutralization scenarios (explosion, integral fallout, rupture, etc.);
- physical boundary characteristics of the launch vehicle to model its deflection
; - fragmentation and explosion data;
- impact energies;
- aerodynamic data for all or part of the falling launch vehicle;
- configuration, dressing and calibration data for the models used;
- parameterization of on-board neutralization algorithms for the self-neutralization part, if this function exists.

ARTICLE 72 - ~~ORDERS SENT FROM THE GROUND~~ GENERATION OF NEUTRALIZATION ORDERS

~~The ground~~ components of the neutralization system must ~~be~~ able to handle the following three orders:
- maintenance;
- controlled neutralization;
- inhibition (or OFF).

The launch operator justifies that the ~~*on-board*~~ *neutralization system* ~~chains~~ are capable of executing the functions associated with each of these orders, in accordance with the procedures laid down in 1'-Article 32- of this order.

ARTICLE 73 - ~~ON-BOARD REMOTE CONTROL RECEIVERS (RTC)~~ NEUTRALIZATION ORDER PROCESSING

On board, orders are received simultaneously by two on-board receivers authorized by CNES, which command two on-board ~~safety chain~~ *neutralization systems.*

The theoretical processing, reception and execution time for the ~~on-board~~ neutralization system is submitted to the President of the Centre National d'Etudes Spatiales during the design phase, as provided for in Article 32 of this order.

For each flight, the launch operator measures the actual time taken to process, receive and execute the ~~on-board~~ neutralization system during campaign activities, and checks that this is consistent with the theoretical time taken. The launch operator forwards this information to the President of the Centre national d'études spatiales as soon as possible, and before transfer to the launch zone at the latest.

ARTICLE 74 - LIMIT OF VISIBILITY OF THE COMMAND OF FLIGHT TERMINATION (TCN)

During the entire MSI phase, the TCN link balance for order transmission is defined by:

- the geometric visibility limit, ~~set at 2.5 degrees of geometric elevation,~~ to protect against the rapid drop in automatic gain control observed at the end of radio visibility, as the antenna passes below the horizon, and against any disturbances of radio electric origin;
- the range limit, taking into account radio electric propagation losses and margins ~~defined by regulatory instruction from the President of the Centre national d'études spatiales~~. It depends on the distance between the remote control ground station and the launch vehicle, and on the antenna used;
- actual reception at each launch vehicle's ~~RTC~~ remote control receiver, within ~~a range of -30 dBm to -90 dBm~~, along the nominal trajectory during MSI.

The values characterizing the limit of geometric visibility, range and reception level of the remote control receivers are defined by regulatory instruction from the President of the Centre national d'études spatiales.

The launch operator must design the trajectory of the launch vehicle to optimize the link budget.

ARTICLE 75 - QUALIFICATION AND CONTROLS

The launch vehicle components contributing to neutralization, each sub-assembly as well as the complete device with its components (wiring, plugs, connections, etc.) are qualified taking into account the ambient conditions representative of the launch vehicle failure.

The launch operator must demonstrate this qualification through dedicated dimensioning tests.

The launch operator must also demonstrate through tests that the equipment works properly after integration of the launch vehicle.
Specifications for all these tests are submitted to the President of the Centre national d'études spatiales in accordance with the conditions laid down in Article 32 of this order.

CHAPTER VI.3 LOCALISATION SYSTEM

ARTICLE 76 - LOCALISATION SYSTEM COMPONENTS

The ground and on-board components of the system used to locate the launch vehicle and determine the potential landing zone, under the responsibility of the operator, are submitted to the President of the Centre national d'études spatiales under the conditions set out in 1'-Article 32- of this order during their design and production phase.

~~This submission covers in particular : -~~
~~the frequency with which data will be made available;~~
~~- the accuracy of the output;~~
~~- the various delays and timeouts.~~
Ground and on-board equipment contributing to the location function is compatible with CNES/CSG flight safety *resources* ~~systems and procedures.~~ The launch operator provides the necessary information to the President of the Centre national d'études spatiales to ensure this compatibility.

In order to exercise MSI, the President of the Centre National d'Etudes Spatiales must have location information available at all times during the ~~propelled~~ flight. ~~This information must come from at least two independent location chains. At least one of these chains must use resources external to the launch vehicle~~. The availability of this information must be ensured after the combination of two independent failures (meeting FS/FS criteria), one impacting the on-board Functional and leading to a hazard, the other concerning a localization chain used for safety purposes.

For the exercise of the MSA, the President of the Centre national d'études spatiales must have access to information on the location of the launch vehicle under the conditions set out in 1'- Article 85 - and 1'- Article 86 - of this order.

Note: In the case of a launch vehicle with reusable components, the components intended to be nominally separated and returned to site must have their own tracking system subject to the requirements of this chapter.

ARTICLE 77 - LOCALISATION SYSTEM DESIGN

The launch operator ensures **that** the ~~on-board~~ components of the tracking system under his responsibility comply with the following criteria:

- ~~overall consistency in terms of reliability allocation, particularly between edge and ground;~~
- ~~redundancy and geographical segregation of location chains (FO criterion);~~
- ~~Reliability levels for early and late failure are consistent with each other. These levels are individually consistent with the launch vehicle's safety objective and mission success objective;~~
- ~~the localization function used in MSI is independent of the navigation function active for the launch vehicle's mission. Any link (dialogue bus, electrical ground, sequential order, etc.) between equipment performing localization functions and on-board functional equipment must not delay or inhibit (whatever the failure) the capabilities of the localization functions.~~

The localization function used within the MSI framework must be robust to any failure of the on-board functional in order to guarantee compliance with the FS/FS criterion. This requirement must be met by providing at least two independent localization chains that are independent of each other and of the on-board function;

- geographical segregation of equipment must be ensured within the physical limits of the vehicle;
- a common failure mode that cannot be ruled out must not jeopardize the overall safety objective;
- the reliability levels of the localization system relating to late failure must be consistent with the overall safety objective and will be set at the "feasibility-design" phase of the safety submission process and ratified via an IR;
- ground and on-board processing of location data by the launch operator must not lead to their alteration;
- every location chain is designed to determine the location of the spacecraft at any time during the flight, in nominal, dispersed or degraded conditions.

ARTICLE 78 - VISUALIZATION OF THE LAUNCH VEHICLE

The launch operator must provide the President of the Centre national d'études spatiales with images enabling real-time observation of the launch vehicle's behaviour. These images must be compatible with CNES/CSG safety systems and procedures, and must at least allow wide-field viewing in two orthogonal planes, covering the vertical space range from 0 to 250 meters, with a field width of around 600 meters. The images must also be able to be used to characterize abnormal behaviour of the space vehicle, during take-off or landing, as long as other means are unable to fully perform the localization function.

ARTICLE 79 - RADAR TRACKING

The launch vehicle is equipped with independent radar transponders compatible with CNES/CSG systems and procedures. Any external localization chain is designed in such a way that it is possible to determine the kinematic conditions of the launch vehicle at any time during its trajectory, and in both nominal and degraded situations.

ARTICLE 80 - LOCATING WITH ON-BOARD EQUIPMENT

The launch operator must ensure the accuracy and robustness of location by means internal to the launcher in all cases of possible failure. In accordance with the provisions of Article 77 of the present order, internal location data may only be taken into account when they are not involved in the navigation, guidance and piloting functions of the launch vehicle.

Ground and on-board processing of this location data by the launch operator must not lead to its alteration (integrity guarantee).

ARTICLE 81 – PERFORMANCE ACCURACY OF LOCALISATION SYSTEM

The launch operator provides the President of the Centre national d'études spatiales with the following information to determine position and velocity localization errors for each means contributing to a *launch vehicle* localization chain:

- data availability frequency;
- location accuracy;
- various data delays and timeouts;
- data integrity performance;
- data continuity performance.

The requirements for these elements are quantified in a Regulatory Instruction issued by the President of the Centre national d'études spatiales. In particular, the IR will specify what is expected when the operator does not control the entire localization chain.
The operator must also report on the internal controls implemented for on-board resources.

These supplies are defined during the safeguard bidding process as set out in - Article 32- of this order.

ARTICLE 82 - QUALIFICATION AND CONTROLS

The elements of the launch vehicle contributing to localization, each sub-assembly as well as the complete device with its components (wiring, plugs, connections, etc.) are qualified taking into account the environmental conditions representative of the space vehicle failure.
The launch operator must demonstrate this qualification through dedicated dimensioning tests, responding to the degraded environment cases assessed for the type of launch vehicle concerned.
The launch operator must also demonstrate through testing that the equipment functions correctly after integration of the launcher.
Specifications for all these tests are submitted to the President of the Centre national d'études spatiales in accordance with the conditions laid down in 1'- Article 32 - of the present order.

CHAPTER VI.4 TELEMETRY SYSTEM

ARTICLE 83 - OBJECTIVES AND REQUIREMENTS FOR THE TELEMETRY SYSTEM

The launch operator sends to the President of the Centre national d'études spatiales telemetry data enabling:

- characterize the status of the on-board remote control ground link, before take-off and in flight;
- assess the status ~~of on-board safety chains~~, before take-off and in flight;
- receive on-board acquisition reports of remote-controlled orders;
monitor the status of on-board automatic systems linked to the safety function, including de-orbiting and passivation functions;
- acquire parameters enabling the implementation of predictive intervention criteria ~~by the ground~~, if provided for;
- acquire the location of the launch vehicle;
- receive the ~~launch~~ vehicle's operating status (propulsion, flight control, electrical equipment).

The means used on board to transmit telemetry are compatible with *CNES/CSG safety resources.*

Note: In the case of a launch vehicle with reusable components, the components scheduled for nominal separation and return to site must have their own telemetry system, subject to the requirements of this chapter.

ARTICLE 84 - USE OF TELEMETRY FOR THE MSI

At all times during the flight, the President of the Centre national d'études spatiales must have at his disposal in real time, for the purposes of exercising his safety and intervention mission as provided for in 1'- Article 63 - of the present order:

- detailed location data;
- the status of the ~~*on-board*~~ back-up system ~~*intervention device;*~~
- data on the progress of the flight sequence;
- on-board data on the operation of the launch vehicle.

The launch operator sends the President of the Centre National d'Etudes Spatiales (CNES) the information needed to define the detailed data required for the MSI, and the associated latencies. The ~~detailed content of the data required for MSI is the~~ subject of a regulatory instruction issued by the President of the Centre national d'études spatiales for each launch system in question.

ARTICLE 85 - USE OF TELEMETRY FOR THE MSA

~~During the propulsion phases, stage separation, deorbiting and the initial conditions phase for controlled re-entry of launch vehicle components,~~ the launch operator must make the following real-time parameters available to the President of the Centre national d'études spatiales, for the purposes of exercising his *Mission of Surveillance and Awareness* as provided for in 1'- Article 64 - of this order:
- detailed location data;
- flight sequence data;
- on-board data relating to launch vehicle operation.

This provision must cover the entire nominal flight of the space vehicle and, as far as possible, deviated trajectories.

In the event of application difficulties due to mission requirements, telemetry holes ~~in the steady-state phase (excluding ignition, extinction or controlled speed change)~~ may be permitted, under certain conditions, in the following phases, as soon as the MSI is completed:

- Non-propelled orbital flight phases, except for orientation manoeuvres;
- Steady-state phase of main engine(s) (excluding ignition, shutdown or controlled speed change);
- Payload separation.

No telemetry holes are acceptable during stage separation, orbit change boosts or de-orbiting, including engagement of the passivation phase, and initial conditions for controlled re-entry of spacecraft components.

The conditions required for acceptance of telemetry holes are :

- the launch operator's justification of ~~these difficulties and associated proposals the~~ impossibility of covering the phase in question, accompanied by an analysis of the associated risks;
- on-board recording ;
- ~~perigee orbit greater than 120 km for the duration of the telemetry hole;~~
- telemetry hole duration compatible with the guarantee of acquisition by the next station in all non-nominal cases (except for explosions during the telemetry hole phase).

The implementation of ~~these~~ measures enabling the acceptance of telemetry holes is submitted by the launch operator to the President of the Centre national d'études spatiales.

The launch operator must provide the President of the Centre National d'Etudes Spatiales with the information needed to define the detailed data required for MSA, and the associated latencies. ~~The detailed content of the data required for MSA~~ is defined in a regulatory instruction issued by the Chairman of the Centre national d'études spatiales for each launch system in question.

~~ARTICLE 86 - USING TELEMETRY TO REMOVE FLOORS FROM SERVICE~~

~~During the launch vehicle stage retirement phases, the President of the Centre national d'études spatiales must have real-time access to:~~

- ~~flight sequence data;~~
- ~~data relating to the proper operation of the launch vehicle.~~

~~In the event of application difficulties due to mission requirements, a telemetry reception hole may be accepted. It is submitted by the launch operator to the President of the Centre national d'études spatiales.~~

~~The detailed content of the necessary data is the subject of a regulatory instruction issued by the President of the Centre national d'études spatiales for each launch system in question.~~

ARTICLE 87 - CSG TELEMETRY SYSTEM

~~The CSG is equipped with telemetry reception facilities for tracking the launch vehicle on standard GTO launch missions to the east.~~
~~For other missions,~~ in the event that the launch operator ~~has to~~ supply the means and input data required to set up the network of specific stations, these means are subject to the safeguard submission stipulated in 1'-Article 32- of the present order.
On-board resources used during launch are compatible with CNES/CSG ~~systems and procedures~~ *safety resources.*

ARTICLE 88 - QUALIFICATIONS AND CONTROLS

The launcher's telemetry components, each sub-assembly and the complete device with its components (wiring, sockets, fittings, etc.) are qualified.
The launch operator must demonstrate this qualification through dedicated tests, responding to the degraded environment cases assessed for the type of launch vehicle concerned.

The launch operator must also demonstrate through tests that the equipment is working properly once the launcher has been integrated.

The specifications for all these tests are submitted to the President of the Centre national d'études spatiales under the conditions set out in 1'-Article 32-of this order.

ARTICLE 89 - FLIGHT DATA PROCESSING

The launch operator must carry out a systematic post-flight analysis of the data transmitted by the ~~launch~~ vehicle concerning the systems contributing to safety.
A summary of these analyses is sent in writing to the President of the Centre national d'études spatiales.
This summary includes, at the very least, any anomalies encountered that could have an impact on safety and the planned treatment of these anomalies.

PART VII. LAUNCH CONDITIONS - FINAL TIMELINE

ARTICLE 90 - LAUNCH REQUIREMENTS

Pursuant to article R331-11 of the French Research Code (Code de la recherche) ~~and article 14-8 of the above-mentioned decree relating to the CNES~~, the President of the Centre national d'études spatiales (CNES) shall stop the launch schedule if one of the criteria defined in Article 91 and Article 92 of the present decree is not met.

ARTICLE 91 - WEATHER CRITERIA

Ground wind

The launch operator provides the quantities and types of propellant used to define the ground wind criterion in the immediate area, in order to ensure the safety of people and property and the protection of public health and the environment.

The ground wind criterion is established as the ~~maximum~~ permissible wind to remain within the threshold of toxic effects defined ~~in the~~ hazard ~~limit~~ by the safety contour.

Wind at altitude

For each launch, simulations are carried out by the President of the Centre national d'études spatiales, ~~taking into account the winds from the last radio sounding~~, using a probabilistic approach for light fragments, and taking into account the vertical wind profile as close as possible to H0, in order to estimate the risk beyond this point ~~and ensure compliance with~~ the safeguard contour, in accordance with Article 61 of the present order.

Lightning

The applicable criteria relating to the risk of lightning striking the launch vehicle are as follows: -
C1: No risk of lightning strikes within a 10 km radius of the launch vehicle. -
C2: No convective clouds with tops above 6500m altitude within a 10km radius of the launch pad at H0.
- C3: No Cumulonimbus anvils over the launch pad, if the thunderstorm cell is less than 20 km away.

ARTICLE 92 - TECHNICAL CRITERIA

Flight safety function

The launch is subject to the condition of the on-board ~~safety system safety chains~~, the correct operation of ground control devices, and the condition of any de-orbiting devices, in order to guarantee that the launch vehicle can be "located, telemetered and neutralized" under the conditions stipulated in PART VI of this order.

The last check on the correct operation of ~~the~~ neutralization, ~~on-board neutralization~~, localization and telemetry systems is carried out in a configuration as close as possible to that of the flight, and as late as possible in the launch chronology.

Authorization and measures by the Minister for Space

The launch is subject to the existence and maintenance of a launch authorization issued by the Minister for Space under the aforementioned law on space operations.

The application of the provisions of this decree is without prejudice to the implementation by the Minister, or, by delegation, by the President of the Centre national d'études spatiales, of the instructions and measures necessary in the interests of the safety of persons and property and the protection of public health and the environment, as provided for in article 8 of the aforementioned law relating to space operations and in article L. 331-7 of the French Research Code.

Collision in orbit

As part of his mission to safeguard launch operations, the President of the Centre national d'études spatiales ensures the protection of manned space objects. To this end, ~~the flight of the launch vehicle within~~ the envisaged launch ~~window~~ must be compatible with the position of manned space objects, whose orbital parameters are precisely known and available.

Vacancy of risk zones at launch

In accordance with the provisions of Article 61 of the present order, the LRA is evacuated during the launch chronology and any controlled re-entry phase. Only those persons required for the launch (or controlled re-entry on site) are authorized to remain in certain reinforced buildings in the LRA, and only those under the control of the President of the Centre national d'études spatiales are authorized to remain in the LRA.

ARTICLE 93 - CSG EXTERNAL PROTECTION

The President of the Centre national d'étude spatial may also set the launch schedule at the request of the State representative responsible for external protection, under the conditions laid down in the aforementioned decree of May 16, 1989.

PART VIII. PENALTIES

ARTICLE 94 - ADMINISTRATIVE FINE

In accordance with article R331-12 of the research code ~~14-9 of the above-mentioned decree relating to the CNES~~, the president of the Centre national d'études spatiales may impose an administrative fine of the amount provided for 5e class contraventions, on any individual or legal entity referred to in article R331-10 ~~14-7~~ of the same ~~decree~~ code, carrying out an activity in breach of the provisions of the present order.

PART IX: ADMINISTRATIVE PROVISIONS

ARTICLE 95 - COMMUNICATION OF INFORMATION, DATA AND FILES

All information, data and files to be transmitted or submitted to the President of the Centre national d'études spatiales in application of the provisions of the present order shall be addressed to the Director of the CSG ~~Centre spatial guyanais~~.

ARTICLE 96 - APPEALS

The present order may be appealed by the applicant to the administrative court with territorial jurisdiction within two months of notification.

Within the same two-month period, the applicant may lodge an appeal. If the President of the CNES remains silent for more than two months on the request for an informal appeal, this implies a decision to reject the request, in accordance with article R. 421-2 of the French Code of Administrative Justice.

ARTICLE 97 - ENTRY INTO FORCE AND PUBLICATION

The provisions of the present decree take effect from the date of its publication in the French Guiana Prefecture's registry of administrative acts.

The present order is freely available for consultation at the Guiana Space Center's badge-issuing office.

Paris, xx/xx/xxxx

APPENDICES

LIST OF REGULATORY INSTRUCTIONS

Titre de l'IR
Definition of the Flight safety resources of CSG
Access to the CSG
Safety training
Traffic rules
Evacuation principles during final time line, for Ariane 6, VEGA et VEGA-C
Access and traffic rules for the 'Iles du salut'
Transportation of dangerous goods
Implantation of installations
Standards and Methods for Structural design (AC)
Definitions of CS, ZP, ZRL, ZRTL, LI
Reliability requirement for neutralisation system
Characteristic values for TCN
Performance requirement for the localisation system
Telemetry transmission for MSI
Telemetry transmission for MSA
Precision concerning the casualty risk in close area
List of official agents authorized to proceed to necessary control for safety and security mission as defined in article L. 331-6 of the French Research Code.
Coordination Instruction for the safety and security missions as defined in article L. 331-6 of the French Research Code.