GENERAL SAFETY INSTRUCTION GSI-M-2

STANDARD PRESSURE EQUIPMENT
1 INTRODUCTION

For the convenience of the reader, this General Safety Instruction uses the masculine gender only. However, its use shall be understood as referring to both genders unless the context clearly indicates a reference to one gender only.

1.1 Legal basis

In accordance with its intergovernmental status, the Organization establishes and updates Safety Rules to implement its Safety Policy.

This General Safety Instruction forms part of the CERN Safety Rules and is issued pursuant to the Staff Rules and Regulations and the CERN Safety Policy.

1.2 Purpose and scope

The purpose of this General Safety Instruction is to define the minimum Safety requirements applying to all standard pressure equipment and accessories belonging to or hired by CERN or the collaborating institutions, used or intended for use at CERN, and to all associated activities.

This General Safety Instruction does not apply to the following:

- fire extinguishers;
- pressure equipment used with an open-flame;
- heating, ventilation and air conditioning (HVAC) equipment;
- cryogenic equipment.

1.3 Definitions

For the purposes of this General Safety Instruction, the following definitions shall apply:

- **Cryogenic equipment**: pressurised and non-pressurised equipment used at a temperature equal to or lower than 123.15 K.
- **HSE Unit**: organic unit competent in matters of occupational health and safety and environmental protection.
- **Laws**: laws, rules, regulations, ordinances, prescriptions, directives, standards and procedures issued by a national or international authority other than CERN or by a professional association or standardisation body.
- **Major repair**: repair operation:
  - which affects the stability or structural behaviour of standard pressure equipment, or
  - which affects the operating mode of standard pressure equipment, or
  - which requires a review of the safety conditions.
- **Maximum allowable pressure PS**: maximum pressure for which the equipment is designed, as specified by the manufacturer.
- **Member of the Personnel**: CERN Members of the Personnel as defined by the CERN Staff Rules and Regulations. Members of the Personnel comprise both employed and associated Members of the Personnel.
- **Organic unit**: department or administratively assimilated unit and CERN Experiments.
- **Owning organic unit**: organic unit which owns an item of mechanical equipment or an accessory. If no owning organic unit can be identified, the organic unit which uses the item of equipment is deemed to be the owning organic unit; if the item of equipment is used by several organic units, one of these shall be designated as the owning organic unit.
- **Pressure**: pressure relative to atmospheric pressure, i.e. gauge pressure.
- **Pressure equipment**: assembly or individual elements consisting of pressurised receptacles, pipework or accessories, which are or may be subject to internal or external pressure as defined by the applicable European directives. Pressure equipment includes all the components attached to the pressurised parts, such as flanges, branches, connectors, supports, lifting lugs, etc.
- **Safety File**: set of documents and data relating to the assessment of the Safety, at all stages of their life cycle, of installations, projects, facilities or CERN Experiments and the corresponding implementation measures and procedures as well as lessons learned.
• **Simple pressure vessel**: any welded vessel subjected to an internal pressure greater than 0.5 bar\(^1\) that is intended to contain air or nitrogen and is not intended to be fired, as defined in Directive 2009/105/EC of the European Parliament and of the Council of 16 September 2009.

• **Sound Engineering Practice (SEP)**: means that pressure equipment is designed taking into account all relevant factors influencing its safety. Furthermore, such equipment is manufactured, verified and delivered with instructions for use in order to ensure its safety during its intended life, when used in foreseeable or reasonably foreseeable conditions.

• **Standard pressure equipment**: pressure equipment, cryogenic pressure equipment, vacuum equipment, simple pressure vessel, transportable pressure equipment and safety accessories.

• **Standard pressure equipment liable to have major Safety implications**: standard pressure equipment:
  - not compliant with the applicable European directives, or
  - of a highly complex design, or
  - using reduced safety factors, or
  - requiring special conditions of use, or
  - using unconventional materials or manufacturing technologies, or
  - presenting a high-level hazard for people, the environment or other installations in the event of failure.

• **Transportable pressure equipment**: all receptacles and tanks used for the transport of certain gases and dangerous substances, as defined in Directive 2010/35/EU of the European Parliament and of the Council of 16 June 2010.

• **User entity**: organic unit or contractor authorised to use an item of mechanical equipment belonging to or hired by CERN or a collaborating institution.

• **Vacuum equipment**: equipment with an internal absolute pressure of close to zero and an external pressure equal to the atmospheric pressure, with the exception of double-walled cryogenic pressure equipment.

For other definitions please refer to section 1.3 of Safety Regulation SR-M “Mechanical equipment”.

### 1.4 CERN Safety Rules and Laws

This General Safety Instruction is supplemented by the documents listed below, where they exist:

- Safety Regulations (SR);
- General Safety Instructions (GSI);
- Specific Safety Instructions (SSI);

and by the relevant provisions of the following Laws:


In the event of any ambiguity or contradiction between the above-mentioned documents, they shall apply in decreasing order of priority, starting from the top.

### 2 MINIMUM SAFETY REQUIREMENTS RELATED TO THE LIFE CYCLE OF STANDARD PRESSURE EQUIPMENT

Pursuant to Safety Regulation “Mechanical equipment” (SR-M), the approval of the HSE Unit is required for each stage in the life cycle of an item of standard pressure equipment liable to have major Safety implications.

In case of doubt concerning the item’s classification as equipment liable to have major Safety implications, the HSE Unit shall decide.

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\(^1\) 1 bar = 10\(^5\) Pa (”bar” unit used in European directives).
2.1 Design
All new standard pressure equipment with a maximum allowable pressure of \( PS > 0.5 \text{ bar} \) shall be designed in accordance with the applicable CERN Safety Rules and Laws (cf. Section 1.4).
The design of all new standard pressure equipment with a maximum allowable pressure of \( PS \leq 0.5 \text{ bar} \) and of all vacuum equipment shall follow the applicable CERN Safety Rules and Sound Engineering Practice for pressure equipment.
The design of standard pressure equipment shall take account of the additional Safety requirements of the Specific Safety Instructions, where they exist.

2.2 Manufacture
All new standard pressure equipment with a maximum allowable pressure of \( PS > 0.5 \text{ bar} \) shall be manufactured in accordance with the applicable CERN Safety Rules and Laws (cf. Section 1.4).
The manufacture of all new standard pressure equipment with a maximum allowable pressure of \( PS \leq 0.5 \text{ bar} \) and of all vacuum equipment shall follow the applicable CERN Safety Rules and Sound Engineering Practice for pressure equipment.
The manufacture of safety accessories at CERN shall be subject to the authorisation of the HSE Unit.
The manufacture of standard pressure equipment shall take account of the additional Safety requirements of the Specific Safety Instructions, where they exist.

2.3 Procurement or arrival/presence on the CERN site
The organic unit in charge of the procurement or arrival on the CERN site of an item of standard pressure equipment shall ensure that it is delivered with at least:

- CE or \( \pi \) marking (if applicable);
- the following documents:
  - the instruction manual;
  - the EC or \( \pi \) declaration of conformity or the EU declaration of conformity and except in the case of a hired item of equipment;
  - the appropriate test reports (except in the case of a hired item of equipment).

The documents shall be written in English or French or in both languages. The EC or \( \pi \) declaration of conformity or the EU declaration of conformity and the instruction manual shall be archived in the Safety File.
The organic unit owning an item of standard pressure equipment already present on the CERN site when this General Safety Instruction comes into force shall ensure:

- that it complies with the applicable CERN Safety Rules and Laws (cf. Section 1.4);
- that all the necessary protective devices have been installed;
- that the Safety File has been established or updated.
The procurement or arrival/presence on the CERN site of an item of standard pressure equipment shall take account of the additional Safety requirements of the Specific Safety Instructions, where they exist.

2.4 Installation
The organic unit owning an item of standard pressure equipment shall install it or have it installed by a competent person in accordance with the manufacturer’s instructions.
All standard pressure equipment shall be protected by safety devices against the risk of overpressure, unless it is protected by other devices within the same assembly.
If a risk assessment reveals a risk of asphyxia or toxicity, an appropriate system for ventilation and evacuation of fluids shall be installed in compliance with the applicable CERN Safety Rules and Laws (cf. Section 1.4).
The installation shall take account of the additional Safety requirements of the Specific Safety Instructions, where they exist.
2.5 Acceptance and commissioning

The acceptance and commissioning of an item of standard pressure equipment shall be subject to:

- a check of the Safety File;
- a general check of the installation conditions (if applicable);
- a visual check;
- a check of the safety devices;
- functional checks to make sure that the item of standard pressure equipment can perform its specific functions safely, with no risk to personnel or the surrounding environment;
- proof tests in accordance with the applicable CERN Safety Rules and Laws (cf. Section 1.4);
- the additional Safety requirements of the Specific Safety Instructions, where they exist.

The checks and proof tests shall be carried out by:

- the HSE Unit in the case of an item of standard pressure equipment with a maximum allowable pressure of $PS > 0.5\, \text{bar}^1$;
- the owning organic unit in the case of an item of standard pressure equipment with a maximum allowable pressure of $PS \leq 0.5\, \text{bar}^1$.

Once checks and proof tests carried out by the HSE Unit have been passed successfully, the CERN Safety Inspection Service shall:

- allocate a CERN identification number to the item of standard pressure equipment;
- draw up an acceptance report which shall be included in the Safety File;
- authorise commissioning.

Once the measures defined above have been successfully completed, the organic unit owning the item of standard pressure equipment shall update the Safety File and declare that the item of equipment has been commissioned.

2.6 Use

Before an item of standard pressure equipment is used for a given activity for the first time, the owning organic unit and the user entity concerned shall assess the risks associated with its use for the activity in question. This assessment shall cover the item of standard pressure equipment as well as the installation to which it belongs and any other equipment that could be affected by its use.

Except where the item of standard pressure equipment has been hired, the owning organic unit shall place the following information on the item of standard pressure equipment or arrange for it to be placed:

- the identification number allocated by the CERN Safety Inspection Service;
- the relevant characteristics of the item of standard pressure equipment, in English or French or in both languages;
- the appropriate configuration for safe use, if possible.

The item of standard pressure equipment shall be used in compliance with:

- the instruction manual;
- the additional Safety requirements as defined in the Specific Safety Instructions, where they exist;
- any additional instructions issued by the owning organic unit.

The user entity shall:

- ensure that the item of standard pressure equipment is used safely in all conditions;
- draw up detailed operating procedures in compliance with the instruction manual and with the additional Safety requirements of the Specific Safety Instructions where they exist. These procedures shall be included in the Safety File;
- ensure that the persons under its responsibility$^2$ using an item of standard pressure equipment are properly qualified and trained.

The use of an item of standard pressure equipment belonging to CERN or a collaborating institution is subject to prior authorisation by the owning organic unit.

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$^1$ In the case of associated Members of the Personnel, the employer shall certify that its personnel have the required qualifications and training.

$^2$ In the case of associated Members of the Personnel, the employer shall certify that its personnel have the required qualifications and training.
An item of standard pressure equipment shall not be operated beyond the values specified in the instruction manual and in the additional Safety requirements of the Specific Safety Instructions where they exist, nor if a malfunction is detected, nor if the date of the next periodic inspection has passed.

2.7 Periodic inspections

Standard pressure equipment (excluding standard pressure equipment with a maximum allowable pressure of $PS \leq 0.5 \text{ bar}$), as well as all safety accessories, shall be subject to periodic inspections comprising:

- a check of the Safety File;
- a general check of the installation conditions (if applicable);
- a visual check;
- a check that the item of equipment is in an identical state to that defined by the manufacturer for all reasonably foreseeable conditions;
- functional checks to make sure that the item of standard pressure equipment can perform its specific functions safely, with no risk to personnel or the surrounding environment.

These periodic inspections shall take account of the additional Safety requirements of the Specific Safety Instructions, where they exist.

A check of the correct operation of safety accessories, where they exist, is compulsory for all standard pressure equipment.

Except in the case of a hired item of standard pressure equipment, the periodic inspections shall be performed by the CERN Safety Inspection Service, at the request of the owning organic unit. The user entity using an item of standard pressure equipment, including hired equipment, shall be responsible for making sure that it has undergone a periodic inspection.

Any item of standard pressure equipment which fails a periodic inspection and cannot be repaired shall be decommissioned and dismantled without delay (cf. Section 2.10).

Periodic inspections shall be documented and the corresponding data archived in the Safety File.

2.8 Maintenance

The organic unit owning the item of standard pressure equipment shall establish a maintenance schedule which guarantees the safety of users and operational safety, based on the manufacturer’s instructions or on the additional Safety requirements of the Specific Safety Instructions where they exist.

Maintenance operations shall be carried out, documented and included in the Safety File.

Where such standard pressure equipment has been hired, maintenance shall be the responsibility of the owner. The user entity using the item of standard pressure equipment shall be responsible for making sure that the maintenance operations have been performed.

2.9 Recommissioning

The organic unit owning an item of standard pressure equipment shall recommission it in accordance with the Safety requirements laid down in section 2.5:

- after any major repair;
- after any modification that was not foreseen as part of the manufacturer’s original design;
- after installation in a different working area;
- after a change of fluid/usage pressure not provided for by the manufacturer;
- after it has remained unused since the last periodic inspection and if the date of the next periodic inspection has passed;
- after each event defined in the additional Safety requirements of the Specific Safety Instructions where they exist.
2.10 Decommissioning/dismantling

In the case of an item of standard pressure equipment that is to be decommissioned and then recommissioned, the owning organic unit shall ensure that:

- the Safety File is archived;
- the HSE Unit is informed, in particular if the item of standard pressure equipment is subject to the Safety requirements for periodic inspections;
- the item of standard pressure equipment is drained of any fluids that could present a hazard;
- the item of standard pressure equipment is made safe and access to it is restricted during the period when it is not in use;
- any non-conformity identified during the decommissioning process is recorded in the Safety File;
- the additional Safety requirements of the Specific Safety Instructions, where they exist, are complied with.

In the case of an item of standard pressure equipment that is to be dismantled, the owning organic unit shall make sure that it cannot be re-used and that it is dismantled in compliance with the applicable CERN Safety Rules and Laws (cf. Section 1.4).

3 SAFETY FILE

The organic unit owning the item of standard pressure equipment shall establish a Safety File and update it. The Safety File shall include the following documents, where they exist:

- the risk assessments;
- the technical file:
  - where it is supplied by the manufacturer, or
  - where the item of the standard pressure equipment is manufactured by CERN (in any case);
- the EC or \( \pi \) declarations of conformity or the EU declaration of conformity (if applicable);
- the instruction manual;
- the acceptance report;
- the declaration of commissioning;
- the periodic inspection schedule;
- the periodic inspection reports;
- the maintenance operation schedule;
- the maintenance operation reports;
- the documents relating to the design and performance of any repairs;
- the dismantling instructions;
- the identity of the owning organic unit.

The documents making up the Safety File shall be written in English or French or in both languages and shall be submitted to the HSE Unit if the latter so requests.

4 FINAL PROVISIONS

4.1 Replacement of existing documents

This General Safety Instruction (version 2), including the applicable CERN Safety Rules and Laws (cf. Section 1.4), cancels and replaces General Safety Instruction GSI-M2 “Standard pressure equipment” (version 1).

4.2 Enter into force

This General Safety Instruction (version 2) enters into force upon its publication on the CERN website dedicated to the CERN Safety Rules: [https://www.cern.ch/safety-rules](https://www.cern.ch/safety-rules).