SPECIFIC SAFETY INSTRUCTION SSI-M-2-3

SAFETY ACCESSORIES FOR STANDARD PRESSURE EQUIPMENT
1 INTRODUCTION

For the convenience of the reader, this Specific Safety Instruction used 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 Organisation establishes and updates Safety Rules to implement its Safety Policy.

This Specific 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 Specific Safety Instruction is to define the additional Safety requirements relating to safety accessories used at CERN for the protection of standard pressure equipment, compared to General Safety Instruction GSI-M-2 “Standard pressure equipment”.

Cryogenic equipment and HVAC (Heating Ventilation Air Conditioning) equipment are excluded from the scope of this Specific Safety Instruction.

1.3 Definitions

For the purposes of this Specific 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.
- **Maximum allowable pressure PS**: maximum pressure for which the equipment is designed, as specified by the manufacturer.
- **Organic unit**: department or administratively assimilated unit and CERN Experiments.
- **Owning organic unit**: organic unit which owns an item of mechanical equipment or accessories. 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 is designated as the owning organic unit.

For other definitions please refer to section 1.3 of Safety Regulation SR-M “Mechanical equipment” and to General Safety Instruction GSI-M-2 “Standard pressure equipment”.

1.4 CERN Safety Rules and Laws

This Specific 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:

- EN ISO 4126 – Safety devices for protection against excessive pressure (Europe).
- EN 764-7 – Pressure equipment – Part 7: Safety systems for unfired pressure vessels (Europe).

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.
## ADDITIONAL SAFETY REQUIREMENTS COMPARED TO GSI-M-2

The following additional Safety requirements compared to General Safety Instruction GSI-M-2 shall apply to safety accessories for standard pressure equipment:

<table>
<thead>
<tr>
<th>Relevant section GSI-M-2</th>
<th>Phase of life cycle</th>
<th>Additional Safety requirements compared to GSI-M-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Design</td>
<td></td>
<td>The arrangement of the safety accessories and their design shall be determined based on a risk assessment of the standard pressure equipment and in agreement with the recommendations of standard EN 764-7 §4. No intermediate shut-off valves shall be installed between the vessel, the safety accessory and the point of discharge. Venting and disposal of fluids shall be in accordance with the applicable CERN Safety Rules and with the applicable environmental requirements; in particular, toxic gases and gases that present an asphyxiation hazard shall be evacuated via an appropriate system. The safety accessories shall be designed and dimensioned according to standard EN ISO 4126.</td>
</tr>
<tr>
<td>2.2 Manufacture</td>
<td></td>
<td>The manufacture at CERN of safety valves shall be subject to prior authorisation by the HSE Unit. The manufacture of rupture disks at CERN is prohibited.</td>
</tr>
</tbody>
</table>
| 2.4 Installation        |                     | New safety accessories shall be declared to the CERN Safety Inspection Service. All safety accessories shall be:  
  - installed in an accessible area to allow visual inspection and dismounting operations, whenever required;  
  - physically protected against mechanical shocks and vibrations whenever such hazards are identified.  
  Redundant safety accessories may be mounted on a 3-way valve. Where 3-way valves are used, standard pressure equipment without protection shall not be isolated in any circumstances. The 3-way valves shall be non-closing devices, allowing the flow to pass in either or both directions.  
  - for all standard pressure equipment as defined in article 3.3 of Directive 97/23/EC;  
  - for standard pressure equipment of PS < 0.5 bar¹.  
  Following a risk assessment, appropriate measures shall be implemented to mitigate the risk of oxygen deficiency due to a leak or to the controlled release of asphyxiating fluids. All safety accessories shall be marked with the following information:  
  - CE mark or π mark (where applicable);  
  - manufacturer’s identity;  
  - year of manufacture;  
  - serial number;  
  - maximum/minimum allowable limits;  
  - CERN ID number allocated by the CERN Safety Inspection Service;  
| 2.5 Acceptance and commissioning |                     | The owning organic unit shall ensure that the CERN Safety Inspection Service verifies the safe operation of all safety valves by means of calibration and a proof test. |

¹ 1 bar = 10⁵ Pa ("bar" unit used in European directives).
### Additional Safety requirements compared to GSI-M-2

<table>
<thead>
<tr>
<th>Relevant section GSI-M-2</th>
<th>Phase of life cycle</th>
<th>Safety accessories for standard pressure equipment used at CERN.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.6</td>
<td>Use</td>
<td>Only safety accessories with a valid CERN identification plate shall be used to protect standard pressure equipment used at CERN.</td>
</tr>
</tbody>
</table>

Safety accessories shall be periodically inspected according to the following procedures:

**External Inspection:** visual inspection of:
- general condition;
- installation/orientation;
- leak tightness;
- vent location;
- discharge piping to check the absence of obstructions.

**Functional test (**): external inspection and test bench verification of:
- set pressure;
- leak tightness.

As an alternative to the functional test, the safety accessory may be replaced.

<table>
<thead>
<tr>
<th>Safety accessory</th>
<th>Frequency</th>
<th>Functional test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot-operated safety valve</td>
<td>Every 6 months, Yearly</td>
<td>Functional test (*)</td>
</tr>
<tr>
<td>Safety valve for flammable gases/gas mixtures</td>
<td>Every 18 months, Every 2 years, Every 3 months, Every 3 years, Every 5 years</td>
<td>Functional test</td>
</tr>
<tr>
<td>Safety valve whose safety function could be altered by external or internal influences (sticking, plugging, corrosion, etc.). All cases other than liquid water.</td>
<td>External inspection (*)</td>
<td>Functional test</td>
</tr>
<tr>
<td>Safety valve whose safety function could be altered by external or internal influences (sticking, plugging, corrosion, etc.). Liquid water.</td>
<td>External inspection (*)</td>
<td>Functional test</td>
</tr>
<tr>
<td>Safety valve for inert and non-oxidising gases/mixtures</td>
<td>External inspection (*)</td>
<td>Functional test</td>
</tr>
</tbody>
</table>

Rupture discs shall be replaced whenever they show signs of deterioration or as explicitly defined by the manufacturer. Rupture discs shall be replaced within a maximum period of 10 years.

(*) The owning organic unit shall carry out an external inspection at least once between two functional inspections. These external inspections shall be documented and included in the Safety File.

<table>
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<tr>
<th>Phase of life cycle</th>
<th>Safety requirement compared to GSI-M-2</th>
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<tr>
<td>2.8</td>
<td>No additional Safety requirement compared to GSI-M-2.</td>
</tr>
<tr>
<td>2.9</td>
<td>No additional Safety requirement compared to GSI-M-2.</td>
</tr>
<tr>
<td>2.10</td>
<td>No additional Safety requirement compared to GSI-M-2.</td>
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</table>
3 FINAL PROVISIONS

3.1 Entry into force

This Specific Safety Instruction (version 1) enters into force upon its publication on the website dedicated to the CERN Safety Rules: https://www.cern.ch/safety-rules.