SPECIFIC SAFETY INSTRUCTION SSI-M-2-4

METALLIC PRESSURISED PIPING
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 Organization 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 metallic pressurised piping used at CERN, compared to General Safety Instruction GSI-M-2 “Standard pressure equipment”.

Cryogenic equipment is 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:

- **Category**: the category depends on the fluid contained, the maximum allowable pressure PS and nominal size DN and the physical condition of the fluid in accordance to Annex II of European Directive 97/23/EC of the European Parliament and of the Council of 29 May 1997.
- **Cryogenic equipment**: pressure 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.
- **Piping**: piping components intended for the transport of fluids when connected together for integration into a pressure system. Various components such as pumps, machines, vessels, etc. are an integral part of the piping.

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 13480 – Metallic industrial piping (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 metallic pressurised piping:

<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>
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<tr>
<td>2.1</td>
<td>Design</td>
<td>Metallic pressurised piping designed at CERN shall comply with standard EN 13480. The design shall also take account of the interaction with components directly connected to the piping system, but not the validation of the components themselves.</td>
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<td>2.2</td>
<td>Manufacture</td>
<td>The piping system shall be manufactured using materials which comply with standard EN 13480-2 and with the harmonised standards referred to therein. Welding work shall be carried out by approved welders in accordance with standard EN 287-1 for the intended processes, groups of materials and range of sizes. Welding operators carrying out fully mechanised or automatic processes shall be approved in accordance with standard EN 1418.</td>
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<td>2.3</td>
<td>Procurement or arrival/presence on the CERN site</td>
<td>No additional Safety requirement compared to GSI-M-2.</td>
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<td>2.4</td>
<td>Installation</td>
<td>No additional Safety requirement compared to GSI-M-2.</td>
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<td>2.5</td>
<td>Acceptance and commissioning</td>
<td>The Safety requirements laid down in section 2.5 of GSI-M-2 and Visual inspection: a visual inspection shall be carried out externally, and internally where possible. The visual inspection shall demonstrate that: i) dimensions and orientations comply with the design requirements of the piping system; ii) the assembly and installation of additional components and supports comply with the requirements of the design specification; iii) safety valves and relief devices have been correctly installed and are of the specified capacity; iv) there is no deterioration resulting from the proof test. Proof test: A hydrostatic pressure test at a pressure of at least 1.43x PS shall be performed for the acceptance of all new piping installations of category I and above. All joints shall be left uninsulated, unlined and exposed for examination during the pressure test. Equipment that is not to be tested shall be either disconnected from the piping or isolated by blank flanges or other means during the test. Where necessary, the hydrostatic pressure test may be replaced by other recognised proof tests subject to the agreement of the HSE Unit. The CERN Safety Inspection Service shall supervise the proof test. Marking: all piping systems of PS &gt; 0.5 bar₁ shall bear a unique identification number directly on the piping or on a name plate attached to it. The marking shall include the following information: a) name and address of the manufacturer; b) description of the piping, including the fluid contained; c) nominal diameter (DN), both DNs at reducers; d) maximum allowable pressure (PS) in bar₁; e) safety device set pressure in bar₁, if applicable; f) maximum/minimum design temperature, in degrees Celsius; g) test pressure in bar₁ and date of pressure test; h) piping class and design standards used; i) the CE marking, if applicable.</td>
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<tr>
<td>2.6</td>
<td>Use</td>
<td>No additional Safety requirement compared to GSI-M-2.</td>
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</table>

1 1 bar = 10⁵ Pa ("bar" unit used in European directives).
### Relevant section GSI-M-2 | Phase of life cycle | Additional Safety requirements compared to GSI-M-2
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2.7 | Periodic inspections | A periodic visual inspection of all metallic pressured piping systems shall be performed according to the manufacturer’s instructions or at the discretion of the organic unit responsible for the piping system in order to check the correct functioning and good condition of the system. Safety accessories used with metallic pressurised piping shall be periodically inspected in compliance with the applicable CERN Safety Rules and with any Laws referred to therein.
2.8 | Maintenance | No additional Safety requirement compared to GSI-M-2.
2.9 | Recommissioning | Recommissioning shall be carried out in accordance with section 2.5 above.
2.10 | Decommissioning/dismantling | No additional Safety requirement compared to GSI-M-2.

### FINAL PROVISIONS

#### 3.1 Entry into force

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