

GP 03-07-01	Piping Layout, Supports, and Flexibility	July 2004
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Piping Layout, Supports, and Flexibility

GP 03-07-01

Scope

[I] This Global Practice (GP) covers layout, support, anchorage, and the provision of thermal expansion and contraction flexibility for piping.

[I] An asterisk (*) indicates that additional information is required, or that a decision by the Owner's Engineer is required. If a job is contracted, this additional information is furnished in the Job Specification.

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1. Required References

[I] This Section lists Practices and Standards that are generically referenced and assumed to be a part of this document. Unless otherwise specified herein, use the latest edition.

1.1. Global Practices–ExxonMobil Engineering Practices

GP 04-02-02	Pipe Supports
GP 10-01-01	Centrifugal Pumps
GP 10-03-01	Special Purpose Centrifugal Compressors
GP 10-03-02	Packaged, Integrally Geared Centrifugal Air Compressors
GP 10-03-03	Rotary Screw Compressors
GP 10-03-04	Axial Compressors for Air Service
GP 10-07-01	General Purpose Steam Turbines
GP 10-07-02	Special Purpose Steam Turbines
GP 17-05-01	Human Factors in Plant Design

1.2. ASME–American Society of Mechanical Engineers

ASME B31.1	Power Piping
ASME B31.3	Process Piping

1.3. ISO–International Organization for Standardization

ISO 15649	Petroleum and Natural Gas Industries - Piping
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* ISO 15649 may be used in lieu of ASME B31.3 if approved by Owner's Engineer.

2. Layout

- 1) [S] Process lines and utility lines critical to safe operation or shutdown of a process unit shall not pass through another unit that will be turned around separately. Such lines shall be located at least 15 ft (4.5 m) from other process areas, except a 20 ft (6 m) spacing from light ends units or fired heaters is required.
- 2) * [S], [R] Pipe trenches and valve boxes (pits) shall not be used unless approved by the Owner's Engineer. Where valve boxes are used, valve handwheels shall be extended to permit operation from ground level.

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- 3) * [R] Process piping shall not be routed underground unless approved by the Owner's Engineer. Underground piping shall be protected from corrosion by wrapping or coating, or some other means approved by the Owner's Engineer.
- 4) [O] Utility stations shall be located so that the entire area to be serviced may be reached with a maximum hose length of 100 ft (30 m) for nitrogen and 50 ft (15 m) for all other services.
- 5) [S] Steam traps shall be located such that discharge is not near cables or other temperature, steam, or condensate sensitive equipment. The separation distance shall be determined by the type of steam trap involved, considering its discharging capabilities.

2.1. Isolation Provisions

- 1) [M] Isolation Provisions—Piping systems shall be designed with sufficient flexibility to permit blinds (spectacle or spacer and blind) to be readily installed for isolation of equipment. At a minimum, locations for blinds shall be in accordance with the following:
 - a) In the piping or at the nozzle of all process and utility connections to vessels, where necessary to provide safe entry for inspection and maintenance personnel.
 - b) In the suction and discharge lines of all turbines and compressors, except atmospheric suction of air fans.
 - c) * At the inlets and outlets of process piping to fired heaters, unless otherwise specified.
 - d) All fuel and pilot gas headers to each fired heater.
 - e) Spared equipment capable of being bypassed for maintenance.
 - f) Safety valve bypass lines.
 - g) Process battery limits.
 - h) Where possible, blind installation locations shall be in horizontal lines.
- 2) * [R], [M] Flanges shall only be used when required for equipment maintenance or operation. The final location of flanges shall be reviewed by the Owner's Engineer.

2.2. Utility Supply and Header Connections

- 1) [S] Utility stations shall be fed from supply headers that can remain in operation during normal unit downtime.
- 2) [O] Steam, instrument air, and fuel gas connections shall be from the top of the supply header.

2.3. Pipeway and Pipe Support Clearances

- 1) * [O] Unless otherwise specified, minimum vertical clearances between finished grade (or top of floor plate) and the bottom of the piping, insulation, or support beam (whichever controls) shall be according to Table 1.

Table 1: Minimum Vertical Clearances

Location		Minimum Clearance	
Above major roads (such as periphery of process unit area limits)		20 ft	6100 mm
Within process unit areas:			
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