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Guidance on Practice for Plant and Instrument Air Systems

GP 60-30

**BP GROUP
ENGINEERING TECHNICAL PRACTICES**

Foreword

This is the first issue of Engineering Technical Practice (ETP) BP GP 60-30. This Guidance on Practice (GP) is based on parts of heritage documents from the merged BP companies as follows:

Amoco

A FE-DRY-AIR-G	Fabricated Equipment Dryer Systems Air Guide
A FE-DRY-AIR-E	Air Engineering Specification

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1. Scope

This GP provides engineering and operational practices associated with the selection and design of instrument air and equipment and the construction, testing, operation, and maintenance, thereof. This GP applies to both onshore and offshore plants and facilities.

2. Normative references

The following normative documents contain requirements that, through reference in this text, constitute requirements of this technical practice. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this technical practice are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

American National Standards Institute (ANSI)

ANSI 7.0.01	Quality Standard for Instrument Air
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American Petroleum Institute

2 FPS	Practice for Design of Floating Production Facilities
RP 520	Sizing & Installing Pressure Relieving Devices
RP 550	Installations of Refinery Instruments and Controls

American Society of Mechanical Engineers (ASME)

ASME Section VIII	Boiler and Pressure Vessel Code
ASME B.1.1.10.1-3	Valves
ASME B 16.3	Valves
ASME B 16.5	Pipe Flanges
ASME B 31.3	Process Piping
ASME B31.1	Power Piping

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GP 6-60	Onshore and Offshore Paints and Coatings
GP 18-01	General Requirements for Welded Fabrication
GP 42-10	Metallic Piping Systems
GP 46-01	New Pressure Vessels
GIS 60-302	Instrument and Utility Air Package
GP 62-01	Valve Selection

Minerals Management Service (MMS) 30 CFR

Part 250	Subpart "A" - Oil & Gas Offshore Operations
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National Fire Protection Association

NFPA 70	National Fire Protection Code
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3. Terms and definitions

For the purpose s of this GP, the following terms and definitions apply:

Ambient temperature

The temperature of the medium surrounding a device.

Dew point temperature

The temperature, referred to at a specific pressure, at which water vapour condenses.

Desiccant

Drying agent used to remove moisture from the air.

Centrifugal compressor

Compressor using an internal rotating wheel type device to compress gas.

Diaphragm compressors

Diaphragm compressors use a flexible diaphragm and check valves to compress a gas.

Elastomeric

A flexible material used to coat valve internals to enhance positive shutoff and product sealing characteristics of the valve.

Instrument quality air

Air, which is the working media for various devices that has been treated to minimize liquid water, compressor oils, and particulate matter.

Micrometer (m)

A metric measure with a value of 10^{-6} meters or 0.000001 meter (previously referred to as "micron").

Particulates

Particulates are solids that become suspended and travel through the supply system where they can cause plugging and malfunction of components.

Parts per million (ppm)

Represents parts per million and are given on a weight basis. The abbreviation is ppm (w/w). If inconvenient to present data on a weight basis (w/w), it may be given in a volume basis; (v/v) and is stated after the term ppm; e.g., 5 ppm (v/v) or 7 ppm (w/w).

Pneumatic transmission system

A system that develops an output directly corresponding to the input information for conveying information—comprising a transmitting mechanism that converts input information into a corresponding air pressure, interconnecting tubing, and a receiving element responsive to air pressure.

Pressure dew point

The dew point value at line pressure of the compressed air system (usually measured at the outlet of the dryer system or at any instrument air supply source prior to pressure reduction). When presenting or referencing dew point, the value is given in terms of the line pressure; e.g., -40°C (-40°F) dew point at 690 kPa (approximate) (100 psig).



Quality assurance

Planned and systematic actions necessary to provide adequate confidence that a product or service satisfies given requirements for quality.

Range of a pneumatic transmission signal

The range determined by the lower and upper limit of the signal pressure.

Reciprocating compressor

Compressor using positive displacement technology and have a piston, cylinder, and valve arrangement similar to an internal combustion engine. The system traps the air or gas, and then reduces the confining space to create an increase in pressure.

Relative humidity

The ratio (expressed as a percentage) of the partial pressure of water vapor contained in the air at a given temperature and pressure to the maximum partial pressure of water vapor that could be present at the same temperature under saturated conditions.

Rotary vane compressor

Rotary vane compressors consist of a vane-type rotor mounted eccentrically in a housing. Compression occurs when the volume of the space between the sliding vanes is reduced as the rotor turns.

Rotary screw compressor

Rotary screw compressors are positive displacement using a screw type internal rotating element to increase pressure to compressing a gas.

Supply pressure:

The pneumatic supply pressure that enables the system element to generate the pneumatic transmission signals specified to provide the final device with required operational force.

4. Symbols and abbreviations

For the purpose of this GP, the following symbols and abbreviations apply:

ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
FOI	Floating Offshore Installation
MMS	Minerals Management Service
NPS	National Piping Size
PPM	Parts Per Million
QA	Quality Assurance
SCFM	Standard Cubic Feet per Minute

