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Guidance on Practice for Control Panels

GP 30-65

BP GROUP
ENGINEERING TECHNICAL PRACTICES

Foreword

This is the first issue of Engineering Technical Practice (ETP) BP GP 30-65. This Guidance on Practice (GP) is based on parts of heritage documents from the merged BP companies as follows:

BP

RP 30-1 Instrumentation and Control, Design and Practice (September 1993).

Amoco

A PC-CP-00-E Process Control, Control Panel, Engineering Specification (June 1997).
A PC-CP-00-P Process Control, Control Panel, Supply Specification (June 1997).
A PC-RI&A-00-E Process Control, Receiver Instruments and Annunciators, Selection, Specification, and System Design Specification (Oct 1997).
A PC-RI&A-00-G Process Control, Receiver Instruments and Annunciators, Guide (Oct 1997).
A PC-RI&A-00-P Process Control, Receiver Instruments and Annunciators, Supply Specification (Oct 1997).

Arco

Std ES-311 Local Control Panels (December 1992).

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1. Scope

- a. This GP provides guidance for the selection, design, and installation of:
 - 1. Local control panels that house control instrumentation and associated equipment in the field.
 - 2. Free-standing control panels in control rooms.
 - 3. Cubicles and nonproprietary equipment cabinets.
- b. This specification applies to totally enclosed, ventilated, and open panels.
- c. For guidance on practice for:
 - 1. Wellhead control panels, see GP 30-66, Wellhead Control Panels.
 - 2. Instrumentation panels such as marshalling panels, or distributed control system (DCS) I/O cabinets that are usually housed inside buildings, see GP 30-40, Control System Hardware.

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.

BP

GP 12-15	Guidance on Practice for Wire and Cable.
GP 12-25	Guidance on Practice for Earthing/Grounding.
GP 12-60	Guidance on Practice for Hazardous Area Electrical Installations.
GP 30-25	Guidance on Practice for Common Field Instrument Issues.

Energy Industries Council

CCI P/3	Instrument Panels (1991).
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International Electrotechnical Commission (IEC)

IEC 60079	Electrical apparatus for explosive gas atmospheres.
IEC 60529	Degrees of protection provided by enclosures (IP Code).

Instrumentation Society of America (ISA)

ISA S18.1	Annunciator Sequences and Specifications.
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National Electrical Manufacturers Association (NEMA)

NEMA ICS 6	Enclosures for Industrial Controls and Systems.
NEMA Publication 250	Enclosures for Electrical Equipment (1000 Volts Maximum).

National Fire Protection Association (NFPA)

NFPA 70	National Electrical Code (NEC) Volume Three of National Fire Codes.
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NFPA 496

Purged and Pressurized Enclosures for Electrical Equipment.

3. Symbols and abbreviations

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

AWG	American wire gauge.
DCS	Distributed control system.
FRP	Fibre reinforced plastic.
I/O	Input/Output.
PAS	Process automation system.
SS	Stainless steel.

4. General

4.1. Selection

- a. The type of control panel for each application, and its size and layout, shall be subject to BP approval.
- b. Control panels may be self-contained or supported by auxiliary equipment cabinets.
- c. Equipment cabinets may be remote from the operational area if:
 1. Remote location provides an overall benefit (for example, space saving or environmental factor) over local placement.
 2. Maintenance operations are not impeded.

Local instrument control panels vary from simple field terminal boxes to large custom designed panels with control instruments housed and displayed for control of various processes from field locations. Each local control panel has its own design and installation specifications.

- d. Operating policy, basis of design, provisional layout, and size of the control panels will be specified by BP.

This is particularly important for an extension to an existing facility to ensure conformity in operator and maintenance facilities.

- e. Control panel design should include consideration of space for project development and future expansion.
- f. Account should be taken of the average height of operating and maintenance personnel.

Average height of operating and maintenance personnel varies significantly worldwide.

- g. Control panels shall meet the service requirements, environment, and electrical classification of the area in which they are to be installed.
- h. Control panels should conform to EIC (Energy Industries Council) Specification CCI P/3.

The specification CCI P/3 is very specific in many aspects of design, construction, and inspection. The specification also contains information about procurement, packing, and shipping.



- i. Control panels located outside control buildings shall be protected from the environment. This protection shall also apply to maintenance operations (for example, when panel doors are open).
- j. Rain shields should be installed over the full length of the panels.
- k. If flooding or high water is expected, the panel should be mounted on standoffs or legs.
- l. The level of protection required from the heating effects of direct sun should be assessed.
- m. On-plant control panels shall be supplied as free-standing assemblies supporting instrumentation and related equipment.

Panel design should consider transportation and site handling, including structural strength, lifting arrangements, size, and weight.

- n. Panels containing instruments directly connected to process fluid shall be arranged to ensure that leaks or spills do not damage other equipment in the panel. Instruments and associated piping containing process fluids shall only be mounted in freely ventilated cubicles or open panels.
- o. Requirements shall comply with GP 30-25 for:
 - 1. Tubing and fittings.
EIC Specification CCI P/3 calls for polyethylene tubing as standard. Copper, sheathed copper, or stainless steel should be specified if needed.
 - 2. Nameplates and instrument tags.
- p. Instrumentation installed in a local control panel should communicate with the plant control and safety systems.
- q. Panels specified as control room panels should have 20% spares for installed and identified future equipment for:
 - 1. Instrument cutouts or empty shelf units.
 - 2. Terminals.
 - 3. Capped bulkhead connections.
 - 4. Power distribution circuit breakers.
 - 5. Pneumatic supply takeoffs.
 - 6. Each fuse type.
- r. Control room panel spares should be distributed throughout the panel.
- s. Panel assembly hardware should at least be:
 - 1. Cadmium plated steel for indoor panels.
 - 2. Type 316 stainless steel for outdoor panels or panels in corrosive service.

4.2. Design

- a. Instruments should be mounted for direct access without interference from wireways, tubing, support brackets, and other instruments so they may be calibrated, maintained and removed.
- b. Pressurised panels should be capable of maintaining the following minimum internal pressures:
 - 1. Outdoor applications: 12 mm (1/2 in) water column.
 - 2. Unpressurised rooms: 6 mm (1/4 in) water column.

