

**PREPARATION OF
PROCESS OPERATION DIAGRAM**

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1. SCOPE

This standard practice covers the purpose and preparation of Process Operation Diagrams (hereinafter referred as POD) for petroleum refineries and chemical plants.

2. WORK PROCEDURE

- (1) A great amount of information is covered in P&IDs, since it includes all the requirements for precommissioning, start-up, normal, shut-down operation, maintenance and safety. Therefore, as an efficient means of preparing high-quality P&IDs, it is very effective to classify and graphically show the information which should be incorporated in P&IDs by category (preparation of PODs).
- (2) Since the preparation of PODs take a large amount of time and the effectiveness of PODs prepared varies depending upon the scale of the plant to be constructed (The greater the scale of the plant, the more effective PODs become.), the lead process engineer for each project should decide as to whether PODs be prepared. When separate documents equivalent to PODs are available, it is not necessary to prepare PODs.
- (3) PODs should be submitted to the client if necessary prior to proceeding with the preparation of P&IDs.
- (4) PODs shall be prepared by using PFDs.
The relevant equipment, piping and instrumentation should be stated in larger or thicker letters and lines than those of other portions so that they can be clearly understood. If necessary, brief explanations should be added for better understanding.

3. DESIGN

3.1 Contents

The following items shall be clarified and indicated in PODs before commencing P&IDs preparation work.

- (1) Precommissioning, start-up and shut-down operation
 - (a) Flushing
 - (b) Purging
 - (c) Steaming-out
 - (d) Evacuation
 - (e) Cold circulation
 - (f) Hot circulation
 - (g) Catalyst pretreating (sulfiding, reduction, etc.)
 - (h) Off spec. product handling
- (2) Normal operation
 - (a) Stream analyzer and sampling point
 - (b) Necessity of control valve block and bypass
 - (c) Driver type
 - (d) Chemical injection point
 - (e) Batch operation
 - (f) Instrument for guarantee
- (3) Safety operation
 - (a) Depressuring
 - (b) Location of safety / relief valves
 - (c) Failure action of control valves
 - (d) Emergency shut-down sequence
 - (e) Auto start system

3.2 Example

For the typical example, POD for start-up circulation and off-spec. product handling of VR unit is attached.