

DESIGN BASIS**JGS 210-120-1-10E**

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1. SCOPE

- (1) This standard practice provides the guidelines for preparation of design basis which is to be established prior to basic design work. This practice also includes documents related to the design basis.
- (2) The design basis covers all basic requirements for the design of entire plant, individual processes and related facilities, as classified in Section 3.

2. WORK PROCEDURE

- (1) The design basis should be prepared by contractor and approved by client prior to any basic design work.
- (2) The design basis can be used as specifications to be followed by a process licensor and/or a packaged unit vendor.
- (3) The design basis can be classified into one of the following three categories;

Table-2 Classification of the design basis

General Design Basis :	A document intended to specify the configuration of an onsite plant and its outline requirements. Refer to Section 3.1.1.
Process Design Basis :	A document intended to specify the performance of a process unit and its outline requirements. Refer to Section 3.1.2.
Facility Design Basis :	A document intended to specify the performance of the offsite and utility facilities and outline requirements. Refer to Section 3.1.3.

3. PREPARATION OF DESIGN BASIS

3.1 Contents of Design Basis

3.1.1 General Design Basis

For the typical contents, see Table-3.1.1 below.

Table-3.1.1 Contents of General Design Basis

1 Scope	The scope of the specification shall be defined, for example, as follows; "This document covers the general design basis of the xxx refinery which will be constructed at yyy, and owned by zzz company."
2 Configuration	(a) Capacity of the whole plant and its main component process units and facilities shall be described briefly. (b) Raw material feed and final product rates shall be specified.
3 Process Units	Name of each process unit shall be described.
4 Material Handling Facilities	Name of each material handling facility shall be described.
5 Utility Facilities	Name of each utility facility shall be described.
6 Auxiliary Facilities	For example, in order to support the abovementioned process units and facilities, the following auxiliary facilities shall be provided. (a) Flare and blow down facilities (b) Waste water treating facilities (c) Fire fighting and protection (d) Control room, etc.
7 Plot Plan Layout Requirements	The following items shall be described in this paragraph. (a) Location of the construction site. Local map indicating the site may be attached to this document. (b) Briefly describe routes or points of feedstock receiving, utilities intake and products transportation. (c) Specify an available total area for the plant. (d) Clarify future expansion considerations. (e) Clarify basis of spacing of units and equipment.
8 Operation	Items including, but not limited to, the following shall be clarified; (a) Startup and shutdown procedure (b) Emergency operation - Power failure - Cooling water failure - Instrument air failure - Other failure, etc. (c) Turndown ratio (d) Design life (e) Degree of integration of units

3.1.2 Process Design Basis

An example specification for the onsite process unit is given in Appendix-1. The typical contents are shown in Table-3.1.2 as follows;

Table-3.1.2 Contents of Process Design Basis

1 Scope	The scope of the specification shall be defined, for example, as follows; "This specification covers the design basis of the xxx unit (hereinafter called xx), which is constructed for the yyy project at zzz refinery of ccc company."
2 Description of Process	Give an outline of the process units such as configuration of sub sections and their feed and products. Sometimes, simple block flow scheme is attached. Clarify operation cases according to variations in feedstock properties and operating conditions, etc.
3 Number of Units and Capacity	Specify the number of units and capacity of each unit.
4 Feedstock Properties	Specify properties of each feedstock.
5 Product Specifications	Define products and specify product cut range and specifications for each product with its test method.
6 Battery Limit Conditions	The battery limit conditions between process units and offsite facilities shall be clarified. The battery limit shall be clearly defined in terms of both location and elevation. All incoming and outgoing streams shall be listed with the following contents. - Stream name - Origin or destination - Battery limit pressure - Battery limit temperature
7 Specific Design Requirements	Key design requirements specifically related to the process shall be described herein. Refer to Section 3.1.4 for further details.
8 Supplementary Design Data	
8.1 Utility Data	Special kinds of utility data used in the unit, if any. Such data are not shown in BEDD or are different from those described in BEDD.

3.1.3 Facility Design Basis

The typical contents of facility design basis for offsite are shown in Table-3.1.3 as follows;

Table-3.1.3 Contents of Facility Design Basis

1	Scope	The scope of the specifications shall be defined, for example, as follows; "This specification covers the design basis of the xxx unit (hereinafter called xx), which is constructed for the yyy project at zzz refinery of ccc company."
2	Description of Facility	Give an outline of each facility and its functions. Specify continuous or intermittent or daylight operation. Specify operation cases, reflecting on design capacity of a facility.
3	Capacity (or conditions for capacity determination)	Specify capacity or conditions for capacity determination of each facility. As an example, the following are given as conditions for capacity determination of each facility. - Annual shipping capacity - Maximum occupancy - Tanker size
4	Raw Material Properties	Specify material properties such as raw water, and blending oil components. Chemicals used in the facility shall also be specified.
5	Specification	Specify final products specification, treated water (filtered, coagulated, chlorinated, softened / demineralized, deaerated) specification, quality of steam at boiler outlet, dew point of instrument air, purified nitrogen specification, etc..
6	Battery Limit Conditions	Clarify battery limit conditions between facilities and process units and outside plant. Refer to Table-3, Item 6 of this practice.
7	Specific Design Requirements	Key design requirements specifically related to the process shall be described herein. Refer to Section 3.1.4 for further details.
8	Supplementary Design Data	If necessary, specific and detailed design data for facility design should be provided by supplementing BEDD
	8.1 Topological Data	
	8.2 Meteorological Data	
	8.3 Utility Data	