

VERIFICATION PROCEDURE**JGS 210-120-1-78E**

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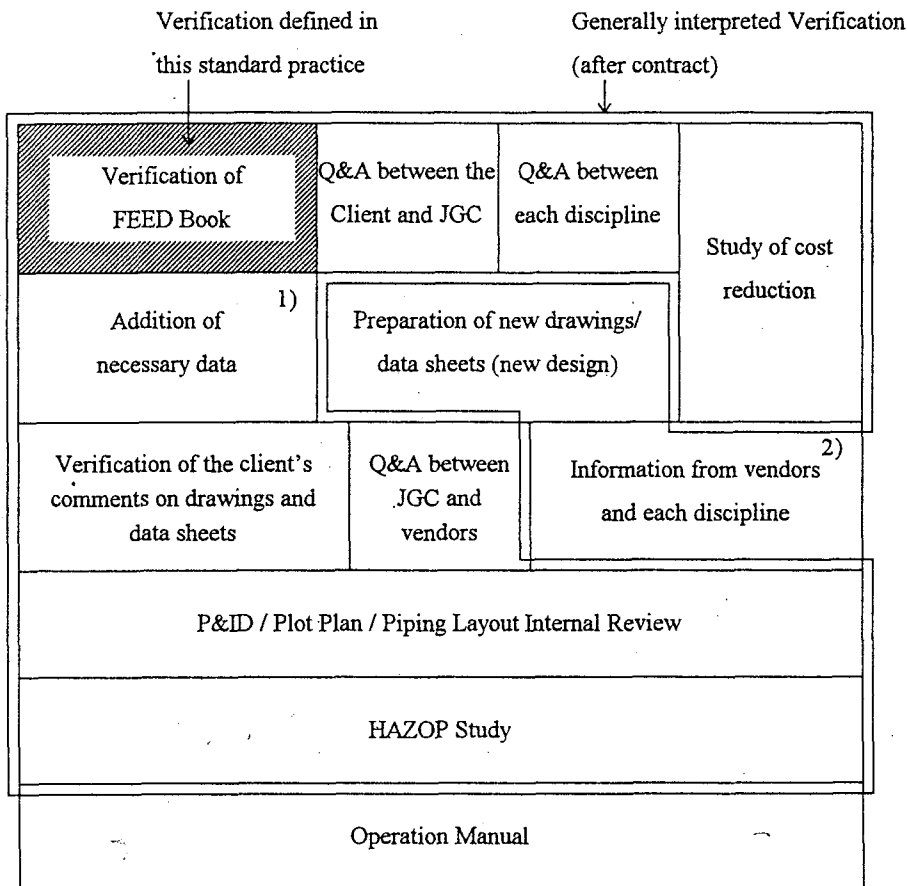
1. SCOPE

This procedure covers how to verify a FEED BOOK prepared by a third party in refinery, LNG, Gas Plant and Chemical plants.

2. DEFINITION

The term "Verification" is herein defined as "check for mistakes and inconsistencies that may exist in data sheets, drawings, etc. of the FEED Book". Note that "Verification" does not cover additional entry of necessary data nor work to be performed during detailed design.

Fig. 1 Generally Interpreted Verification (after contract) and Verification Defined in this Standard Practice



Note 1) Example of UOP sch. A: - Utility Flow Diagram
 - Line Index
 - Insulation thickness
 - LC - LG Arrangement etc.

2) Incorporation of vendors' data, change of P&IDs resulting from change in piping layout, change of pump head, etc.

3. BASIC PRINCIPLE

Basic Principle concerning Verification Procedure is hereafter described. However, this standard practice is a general guide and each Verification Procedure should be established considering specific features of the project.

3.1 General

Verification is not necessary in cases where JGC is not responsible for guaranteeing Process Performance to Client.

Verification should be conducted along with the following in cases where JGC is responsible for guaranteeing Process Performance.

3.2 Estimation Job Phase

If the FEED Book is prepared by a well-known engineering firm having sufficient experience in the area concerned, simple Verification should be conducted, in which attention is paid to only the capacity of each unit and critical items of equipment.

3.3 After Contract Phase

For non-licensed units, in which JGC is responsible for guaranteeing Process Performance because the third party (the party preparing the FEED Book, the Licensor, or the Client) does not offer such a guarantee, Verification (ex. H&W Balance Verification) should be conducted for Process Performance to be guaranteed. For licensed units, in which the third party guarantees Process Performance to JGC and JGC guarantees Process Performance to Client, Verification (ex. H&W Balance Verification) is not necessary for Process Performance guarantee.

For above both cases, Verification of Hydraulics, Safety, Simple mistakes, Consistency and Code requirements should be necessary as follows.

- (1) Verify the critical items of equipment at first for prompt purchase order.
- (2) No further Verification should be conducted where the results of the Verification show no or little changes.
- (3) Progressive control should be adopted in such a way that wider and further Verification will be conducted if changes are considerable.

4. VERIFICATION AT ESTIMATION JOB PHASE

4.1 Where JGC is not responsible for guaranteeing Process Performance to Client, it is not necessary to conduct Verification.

Where JGC is responsible for guaranteeing Process Performance to Client and the contract specifies that the results of Verification after contract could be handled as change orders, it is not necessary to conduct Verification.

4.2 Where JGC is responsible for guaranteeing Process Performance to Client and the results of Verification after contract are unlikely to be dealt with as change orders, the following should be verified.

- (1) Plant consisting of more than one unit:
 - Capacity of each process unit; by checking whether the flow rates shown on PFDs of upstream/downstream process units match with the capacity of the process unit to be verified, and whether the Client's design philosophy (margin, spares, etc.) is incorporated.
 - Boiler, cooling water system, and generator capacities; by totalizing consumptions given in the utility summary of each unit and facility, and checking whether the Client's design philosophy (margin, spares, etc.) is incorporated.
- (2) Critical Items of Equipment (furnaces, compressors, large towers, and reactors):
 - Data sheets for critical items of equipment; by checking whether those data sheets match with the Client's design philosophy (margin, spares, etc.), PFD, and design documents (PFDs, equipment data sheets, P&IDs, etc.) for other items of equipment.

4.3 Notwithstanding the above, where the ITB requires that some specific items be verified and that the results of the Verification be included in the contractor's proposal, Verification should be conducted as required in the ITB. General requirements of Verification, such as design ensuring safety and design meeting the requirements of codes, may be disregarded.