

**PREPARATION OF OPERATION
MANUAL****JGS 210-120-1-52E**

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1. SCOPE

- (1) This standard practice covers the basic considerations, necessary contents and noteworthy related points in preparing the operation manuals. (*)
- (2) The purpose of this practice is to standardize the quality of the operation manuals which shall be prepared by JGC.
- (3) Although operation manuals differ to some extent from process to process, the basic design shall conform to the philosophy and standardization concepts as much as possible.
- (4) When Client prepares the operation manual, JGC will provide the operation guide to assist. The operation guide consists of the essence of the operation manual.

(*) Note: When the requirements are indicated in the contract, the contents etc. shall conform.

2. BASIC CONSIDERATIONS IN PREPARING OPERATION MANUALS**2.1 JGC Processes**

The basic engineer should keep the following in mind when preparing operation manuals.

2.1.1 Purpose

- (1) The purpose of an operation manual, from JGC's standpoint, is not only to help the Client's operation engineers, but also to protect JGC from any liability which may arise as a result of any trouble or damage sustained by the plant due to maloperation.
- (2) It is impossible to design a perfectly safe plant. Accordingly, the "Design Philosophy of Basic Design" mentioned in JGS 210-120-1-02E should be reflected in the operation manual.
- (3) Also, minor defects may be found during the design stage. These should be covered by the pertinent operation manual, or preferably by modification of design.
- (4) In this context, it should be emphasized that the preparation of an operation manual is the final item of basic design work.

2.1.2 Extent of Description

- (1) In principle, the operation manual furnished by JGC is one typical example of operational procedures and a guideline for familiarizing operators with the plant.
- (2) The detailed operation procedures including the sequence of valve operation, time schedule, etc., should be prepared by the Client's operation engineers, taking into consideration the actual organization, staffing, emergency communication channels, etc..
- (3) Alternatively, in the event that an operation supervisor be dispatched by the process licensor or JGC, he shall be responsible for preparing the above detailed operation procedures in consideration of the time schedule.

2.1.3 Protection of JGC from Liability in the Event of Maloperation

- (1) The basic engineer should carefully study the past history of troubles experienced and countermeasures employed in similar processes to date.
- (2) Abnormal levels of operating variables (temperature, pressure, flow rate, level of fluid in vessel, etc.) together with appropriate countermeasures should be listed in the operation manual as far as possible, to avoid similar troubles. Although it is not necessary to go into detail, it is important to mention the possibility of abnormal operating conditions. This will serve to protect JGC from liability in the event of trouble.

2.1.4 Final Check of Basic Design

- (1) Along with the preparation of the operation manual, the basic design should be checked carefully at this stage.
- (2) The operation philosophy (or operation notes) which was prepared at the early stage of the basic design shall be reviewed.
- (3) Make sure that necessary facilities, equipment, instruments and lines, etc., for each operation mode (namely start up, normal operation, shut down, emergency, regeneration, maintenance, etc.) are taken into consideration.

2.2 Other Licensed Processes

- (1) In principle, operation manuals for other licensed processes should be furnished by the process licensor.
In every job, however, the operation manuals are issued in different styles as follows:
 - (a) They are issued in the original style after checking,
 - (b) Cover sheet and document designed by JGC are attached to them and issued in minor changed style,
 - (c) Adding to (b) above, they are changed considerably and issued in JGC style.
- (2) Before making any unavoidable modifications, it is necessary to obtain the approval of the process licensor.

3. CONTENTS OF OPERATION MANUAL

- (1) In order to standardize the quality of the operation manual, the items (chapters) which shall be included in the operation manual, are listed in Table 2.
- (2) Needless to say, some of these items may be modified or deleted depending upon the particular process.

4. NOTEWORTHY POINTS**4.1 General**

- (1) Generally, the following documents shall be read to prepare the operation manuals:
 - (a) Operation manuals of same process unit in past editions
 - (b) Feed and product specifications shown in Contract and Analytical standard specification such as ASTM
 - (c) Vendor's instruction manuals (including catalyst vendor)

Vendor's instruction manuals take priority over the operation manual prepared by JGC, in order to place the responsibility for maloperation on the vendors.

- (2) It is recommended that the following be inserted in the operation manual for the operator's convenience and easy comprehension in addition to the Attachment shown in Table 3.
 - (i) Simplified flow scheme of plant heat-up
 - (ii) Simplified flow scheme of catalyst reduction, activation, oxidation and regeneration
 - (iii) Simplified flow scheme of feed cut-in, shut-down and other operation modes

4.2 Chapter 1~3

Need no particular mention.

4.3 Chapter 4

- (1) Special or critical control scheme should be explained.
- (2) Key operating variables (Flow rate, Temperature, Pressure etc.) in normal/start up operation should be designated as target values.
- (3) Highest and lowest alarm and trip set values should be listed up.

4.4 Chapter 5

The activities described in this chapter are done between construction and commissioning, and there completion leads to turnover to Client.

And so, since the general and detailed procedures are noted separately, only the general description should be given in this chapter.