

Engineering Procedure

SAEP-1640

28 February 2005

Operating Instructions for Process Automation Systems

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Saudi Aramco DeskTop Standards

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1 Scope

This Saudi Aramco Engineering Procedure (SAEP) provides the requirements for the Operating Instructions Manual used with Process Automation Systems (PAS). The Manual need not follow the format provided in this procedure, but shall contain the information specified.

The Manual covered by this procedure shall be considered as one of the Non-Material Requirements (NMR) called for by [SAEP-16](#).

2 Conflicts and Deviations

- 2.1 Any conflicts between this Procedure and other applicable Saudi Aramco Engineering Procedures (SAEPs), Saudi Aramco Engineering Standards (SAESs), Saudi Aramco Materials System Specifications (SAMSSs), Saudi Aramco Standard Drawings (SASDs), or industry standards, codes, and forms shall be resolved in writing by the Company or Buyer Representative through the Manager, Process & Control Systems Department of Saudi Aramco, Dhahran.
- 2.2 Direct all requests to deviate from this Procedure in writing to the Company or Buyer Representative, who shall follow internal company procedure [SAEP-302](#) and forward such requests to the Manager, Process & Control Systems Department of Saudi Aramco, Dhahran.

3 Applicable Documents

All referenced Procedures, Standards, Specifications, Codes, Forms, Drawings, and similar material or equipment supplied shall be considered part of this Procedure to the extent specified herein and shall be of the latest issue (including all revisions, addenda, and supplements) unless stated otherwise.

Saudi Aramco Engineering Procedures

[SAEP-16](#)

Project Execution Guide for Process Automation Systems

[SAEP-302](#)

Instructions for Obtaining a Waiver of a Mandatory Saudi Aramco Engineering Requirement

4 Responsibilities

- 4.1 Saudi Aramco Project Management Team (SAPMT)

Responsibilities include:

- a. Ensure that the procedures in this SAEP are used to prepare the Operating Instructions.

- b. Submit the Operating Instructions for review in accordance with [SAEP-16](#) and Job Specification requirements.
- c. Review and approve the Operating Instructions.

4.2 Operating Organization

The operating Organization is responsible for reviewing and approving the Operating Instructions.

5 Instructions

The Operating Instructions shall provide the operators of the Process Automation System with all information and instructions necessary for day-to-day operation of all the Process Automation System equipment supplied by contractor. The Operating Instructions are expected to be primarily composed of the equipment vendor's standard operator manuals, as long as the minimum requirements of this standard are met. Subjects not covered by standard manuals shall be included in custom documentation.

The Operating Instructions shall provide operating procedures for all plant-specific applications that have been configured for the PAS including, but not limited to, advanced regulatory controls, supervisory/advanced controls, product movement, storage, and blending, and compressor controls. Procedures for using custom displays including graphics, faceplates, overlays, and data entry areas shall be provided.

Appendix A provides an outline of the minimum required contents of the Operating Instructions. The format suggested in Appendix A need not be followed. A format more appropriate to the needs of the particular project may be developed. In any case, the Instructions shall be organized to explain the System in terms of its application and operation and be as self-contained as possible. References to other documents should be minimal. The text must be factual, concise, specific, clearly worded and illustrated. Abbreviated tabular data such as charts, tables, checklists and diagrams should be used whenever practicable.

Technical detail reflected in the Instructions should be expressed in wording that is easily understood by an operator. Discussions of theory should be omitted, unless essential for practical understanding and application. The emphasis should be on the specific steps to be followed, the results that may be expected or desired, and the corrective measures required when such results are not obtained.

To provide for ease of use, it is strongly recommended that operating procedures for a given item of equipment be in a separate self-contained volume of the Instructions. For example, the operating procedures for the operator console will be contained in one volume while the operating procedures for the remote controller station will be in another volume.

If the Job Specification requires a preliminary version of the Operating Instructions, then the preliminary version shall consist of a detailed outline, annotated as necessary

for clarity, and the information specified under Sections 1.1, 1.2, and 4.1 of Appendix A.

6 Definitions

6.1 Acronyms

DCS	Distributed Control System
ESD	Emergency Shutdown System
FSD	Functional Specification Document
MIS	Management Information System
NMR	Non-Material Requirement
PC	Personal Computer
PLC	Programmable Logic Controller
SCADA	Supervisory Control and Data Acquisition

6.2 Definitions of Terms

Process Automation System: A network of computer-based or microprocessor-based modules whose primary purpose is process automation. The functions of a PAS may include process control, safety, data acquisition, advanced control and optimization, historical archiving, and decision support. Examples of process automation systems are DCS, SCADA, MIS, ESD, PC and PLC-based systems.

Job Specification: The statement of work for a process control project that is incorporated as Schedule "B" of the Contract.

Revision Summary

28 February 2005	Revised the "Next Planned Update". Reaffirmed the contents of the document, and reissued with no other changes.
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Appendix A – Required Operating Instructions Contents

1. Introduction

1.1 Scope

This section shall define the scope of the Operating Instructions, and shall define its structure and summarize its content.

1.2 Objectives

This section shall define the intent of the Operating Instructions.

2. Definitions

This section shall provide a listing with definitions of terms, phrases, and acronyms used in this document that are subject to interpretation by the user.

A simple translation of an acronym is not sufficient unless the meaning of the translation is obvious.

3. Applicable Documents

All documents referenced within the Operating Instructions shall be listed and completely identified in this section.

4. System Description

4.1 Introduction

This section shall provide an overall view of the Process Automation System, its operation and capabilities, and its intended use.

4.2 System Configuration

This section shall describe the hardware configuration(s) and shall reference a diagram(s) depicting the Process Automation System. This section shall also reference a software block diagram showing a layered structure of all software modules and data bases included in the system.

4.3 Equipment Functional Description

This section shall provide functional descriptions of the equipment, software, and data bases comprising the Process Automation System. The following information shall be included:

- a) Purpose
 - b) Characteristics
 - c) Special features
 - d) Functions
-

e) Illustrative figures

5. Operating Instructions

The following sections shall provide the instructions or procedures for the process operator.

The text for each procedure shall include an explanation of why an action is taken and the equipment involved as well as detailed step-by-step procedures, restrictions, and results. If the procedure includes several modes of operation, each mode shall be clearly defined and presented individually. Supporting illustrations and diagrams shall be used whenever the result will be a more effective presentation of information.

The operations in this section shall include, but not be limited to, those listed below. The section may be formatted according to the Contractor's in-house standards.

For a system in which a given operation listed below does not apply, that particular section will therefore not be required

5.1 Start-Up Operations

This section shall contain the detailed step-by-step procedures for start-up and initialization of the System. Initialization procedures shall include such operations as power-up, configuration download, sign-on and set time and date.

5.2 Display Operations

This section shall provide the procedures for accessing and using the various displays available to the operator. The display types shall be described followed by the corresponding access procedure. Examples of displays with access capabilities are as follows:

- a) Overview display
- b) Group display
- c) Detail display
- d) Trend display
- e) Custom-configured displays

5.3 Control Operations

This section shall describe why an operation is performed and the procedures for control operations that affect either the process itself or the parameters of the device controlling the process. The following is a sample list of general control operations:

- a) Signal or access

- b) Change signal or point mode (e.g., Manual/Auto, Enable/Disable)
- c) Change signal values (e.g., controller output, setpoint, status of discrete value).

5.4 Logging And Recording

This section shall provide the procedures for logging and recording operations that involve making a permanent printed record or chart of process data.

5.5 Alarm Operations

This section shall describe all alarm operations as well as provide the step-by-step procedures associated with each alarm operation. A description of all alarm types shall also be provided and shall include the format, the meaning or purpose, and the corresponding response or actions required. Examples of alarm operations are as follows:

- a) Alarm acknowledgment
- b) Alarm enabling/inhibiting
- c) Access and use of Alarm History.

5.6 Trend Operations

This section shall state the purpose and provide the step-by-step procedures for trend operations which store and display historical data or provide real-time trends. Examples of trend operations are as follows:

- a) Variable trend recording
- b) Historical trend playback
- c) Hard copy recording

5.7 Shutdown Operations

This section shall provide the step-by-step procedures for all applicable types of process computer shutdown operations that would be performed by the process operator. Examples of shutdown operations are:

- a) Normal shutdown
- b) Emergency shutdown

5.8 Power Failure Recovery

This section shall provide the step-by-step procedures for the orderly recovery of the System following both short and long-term power failures.

5.9 Security

This section shall provide the procedural instructions for the operations related to restricted access to the System. The procedures for the various security levels, where applicable, shall be provided.

5.10 System Error Messages

This section shall contain a list of System message generated as a result of the process operator's activity or to indicate a warning that a System hardware/software failure may be imminent or has occurred. This section shall also provide the operator a guide to the correct interactive procedures. Examples of types of messages generated are as follows:

- a) Status Messages: These indicate the progress or result of an activity.
- b) Operator Error Messages: These indicate either an improper operator procedure or an incorrect format entry made at the console.
- c) System Error Messages: These are generated to indicate a warning that a System hardware/software failure may be imminent or has occurred.

5.11 Diagnostics

This section shall contain the operator procedures related to supporting diagnostic operations. The procedures shall include only those steps that the operator would perform to assist the qualified service personnel.