

Engineering Procedure

SAEP-119

30 April 2005

Saudi Aramco Materials System Specifications

Document Responsibility: Standards Coordinator

Saudi Aramco DeskTop Standards

Table of Contents

1	Scope.....	2
2	Applicable Documents.....	2
3	Instructions.....	2
4	Responsibilities.....	6
Attachment I - Exception Style Saudi Aramco Materials System Specification..... 7		
Attachment II - Narrative Style Saudi Aramco Materials System Specification..... 11		

1 Scope

This procedure establishes instructions for the development and use of approved procurement documents called Saudi Aramco Materials System Specifications (SAMSSs). This procedure also assigns responsibilities for those associated with these documents.

2 Applicable Documents

The requirements contained in the following documents and forms apply, to the extent specified in this procedure.

Saudi Aramco Engineering Procedures

[SAEP-103](#)

Metric Units of Weights and Measures

[SAEP-125](#)

Saudi Aramco Engineering Standards

[SAEP-301](#)

Mandatory Saudi Aramco Engineering Requirements

[SAEP-302](#)

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

Saudi Aramco Engineering Standard

[SAES-A-112](#)

Meteorological and Seismic Design Data

Saudi Aramco Materials Instructions Manual

CU 11.1

Cataloging

Saudi Aramco Standard Packing Manual

3 Instructions

3.1 Definition and Purpose

SAMSSs are material or equipment specifications, used for procurement, that have been approved by Saudi Aramco Management. They establish minimum engineering, design, fabrication, and testing requirements for procured material or equipment. They are written to cover material or equipment that are procured on a repetitive basis, and where the complexity or unique characteristics require an extensive write-up to clearly state all requirements. Attach entire SAMSS documents to purchase requisitions, requests for quotation or purchase orders. Specifiers should not extract portions of SAMSS documents nor write new specifications to procure material or equipment already included within the

Scope of approved SAMSSs.

The SAMSS document, together with a purchase requisition and, in some cases, one or more of the following, form an integral package that can be used to procure material or equipment:

- data sheet(s), drawing(s), and specification sheet(s)
- Saudi Aramco Engineering Standards (SAESs)
- additional project-specific design requirements, not covered by the SAMSS

3.2 Use of Existing Industry Standards

If an industry standard meets all the Company's requirements with no modification, specify it in the appropriate SAES and use it to define the technical purchasing requirements. In this case, do not create and maintain a SAMSS.

3.3 Format

Base the structure of all SAMSS documents on one of two styles: Exception or Narrative.

3.3.1 Exception-style SAMSSs define requirements as additions, modifications or deletions to the requirements in an industry standard, using the industry standard's chapter/sections/paragraph numbering system. Use this style when an industry standard already defines the majority of Saudi Aramco's requirements. This is the preferred style because it reduces the number of requirements that must be generated and maintained. It also offers the benefit of alerting users to the Company's special requirements. See Attachment I for details of this style. Avoid repeating unchanged parts of the industry standard in the SAMSS.

3.3.2 Narrative-style SAMSSs are used when the Standards Committee Chairman determines that an appropriate industry standard does not exist. He may supplement the content of one, or more, industry standards, but the requirements are not written as exceptions. Tailor the document structure of this style to meet the specific needs of the subject. See Attachment II for additional details associated with this style.

3.4 Contents

3.4.1 Write using simple, easy-to-understand language. Active sentences are preferred because they are usually shorter and more explicit than passive sentences. Use the verb "shall" to indicate mandatory requirements.

Establish the wording of the title as carefully as possible. It shall indicate, concisely and without ambiguity, the subject matter of the specification in such a way as to distinguish it from that of others, without going into unnecessary detail. Any necessary additional particulars shall be given in the Scope.

Every specification shall begin with a Scope section. Here, define without ambiguity, the subject of the specification and the aspect(s) it covers. The Scope shall not contain requirements.

Include all requirements in the SAMSS needed by the supplier to manufacture and test the material or equipment that Saudi Aramco wants to procure. SAMSSs may not make reference to individual paragraphs in a SAES. SAMSSs may reference a complete Saudi Aramco Engineering Standard (SAES) only if the SAES specifically includes a statement that the document is approved to be attached to purchase orders. See [SAEP-125](#), for additional details on the contents and use of SAES. Make reference to the content and details of Standard Drawings to the extent that they apply to the material or equipment. To assist the specifier to correctly use the SAMSS, consider development of companion data sheets that will guide him in collecting all requirements.

Where specific requirements or conditions need to be repeated in a number of SAMSSs, develop and locate them in separate mandatory documents such as another SAMSS, an SAES, or Standard Drawing. (For example, see [SAES-A-112](#) "Meteorological and Seismic Design Data".) Use appropriate references to the separate documents in the SAMSS.

Include definitions of technical terms used within the SAMSS. Do not include nontechnical provisions already covered in Saudi Aramco's standard terms and conditions for contracting and purchasing, such as risk of loss, liability for failure or damages, warranties, rights to inspect, and other such legal matters. Check with the Law or Purchasing Departments if in doubt.

SAMSSs will normally include inspection and testing requirements. Use "175-series" forms to collect all inspection and testing requirements from the SAMSSs, referenced industry documents, and other sources that apply. Develop "7900-series" forms to identify other nonmaterial requirements that are an integral part of orders, and support the procured material or equipment. Develop "8314-series" or "8444-series" forms to identify packing specification requirements. See the Saudi Aramco Standard Packing Manual for additional information.

Where there is a need to review or approve certain technical items covered by the SAMSS (alternate designs, repairs, welder qualifications, test procedures, etc.) by someone in Saudi Aramco at Manager level, or below, indicate this responsibility by designating a specific position (Standard Committee Chairman, Unit Supervisor, Division Coordinator, etc.). Do not use generic titles such as "the Saudi Aramco Engineer". See Attachment I for example.

- 3.4.2 Give preference to referencing SAMSSs to the "latest edition" of an industry standard. However, the Standards Committee Chairman may determine that reference to a specific edition of the industry standard, will best satisfy the needs of the Company.
- 3.4.3 Use the International System (SI) of Units in SAMSSs, following the instructions of [SAEP-103](#), Metric Units of Weights and Measures.
- 3.4.4 Where additional information or explanation is needed to clarify the intent of a requirement or where there is a reasonable chance of misinterpreting or misapplying the requirement, include a commentary note. Make the note brief, limiting it to only the essential items. To distinguish it from the SAMSS requirements, label the note "COMMENTARY" and use italics. See Attachment I for example.

3.5 Deviations

- 3.5.1 Deviations proposed by the supplier that result in material or equipment meeting less than the minimum requirements require waiver approval in accordance with [SAEP-302](#) before issuance of a Purchase Order. For deviations identified after a Purchase Order is issued, the waiver approval is required prior to material or equipment shipment.
- 3.5.2 The Responsible Standardization Agency (RSA) Representative (as defined in CU 11.1, Cataloging), may give written approval for substitution of material or equipment with equivalent characteristics or performance, that conform to standards other than those specified. Handle appeals to an RSA Representative substitution rejection by means of the waiver process. See [SAEP-302](#) for details.

3.6 Approval

Use the approval process outlined in [SAEP-301](#) "Mandatory Saudi Aramco Engineering Requirements" to develop new SAMSSs and revise existing SAMSSs. To keep SAMSSs current and up-to-date, conduct a major review and revision of every SAMSS at least every five (5) years, or other appropriate interval established for the document.

3.7 Distribution

The Standards Coordinator will ensure that the information of all approved SAMSSs is disseminated per [SAEP-301](#).

4 Responsibilities

Standards Committee Chairman (SCC) is responsible for doing the following:

- Determining the need for SAMSSs, and if required, developing them, making decisions about their style and content.
- Verifying the cost-effectiveness and technical adequacy of the minimum technical and non-material requirements contained in the SAMSSs.
- Conducting a major review of every SAMSS at least once every five years and making the necessary revisions.
- Working with the Inspection Department to develop appropriate "175-series" Inspection Requirements forms, to support the material or equipment covered by the SAMSSs.
- Working with the Materials Traffic Department to develop new packing specifications where existing ones do not provide adequate protection.
- Coordinating the SAMSSs requirements with the RSA Representative.

Revision Summary

31 May 2003	Revised the "Next Planned Update". Reaffirmed the contents of the document, and reissued with editorial changes.
30 April 2005	Editorial revision to make the REFERENCES (As applicable) rather than (Mandatory).

Attachment I – Exception Style Saudi Aramco Materials System Specification

The Exception style SAMSS is preferred. It shall follow the document structure outlined below.

TITLE AND TABLE OF CONTENTS (Mandatory)

The Title and Table of Contents identify the material specification and lists its contents. Subheadings may be used to improve the usefulness of the Table of Contents.

SCOPE (Mandatory)

The Scope will define the material or equipment covered by the specification. In most cases the Scope will begin with:

"This specification defines the minimum mandatory requirements for ____".

If the document's Scope is not unique to Saudi Aramco, summarize the Scope section of the industry standard. The Scope may include a description of areas specifically excluded from the document. (For example: "This specification is not applicable to bowl-type submersible pumps".) Do not include requirements in the Scope.

CONFLICTS AND DEVIATIONS (Mandatory)

Include the following two paragraphs in each SAMSS:

"Any conflicts between this specification and other applicable Saudi Aramco Materials System Specifications (SAMSSs), Engineering Standards (SAESs), Standard Drawings (SASDs), or industry standards, codes, and forms shall be resolved in writing by the Company or Buyer Representative through the Manager (Consulting Services, Loss Prevention, etc.) Department of Saudi Aramco, Dhahran".

"Direct all requests to deviate from this specification in writing to the Company or Buyer Representative, who shall follow internal company procedure [SAEP-302](#) and forward such requests to the Manager (Consulting Services, Loss Prevention, etc.) Department of Saudi Aramco, Dhahran".

Some SAMSSs may indicate that someone in Saudi Aramco must review or approve specific items covered by the specification (alternate designs, repairs, welder qualifications, test procedures, etc.). In this case, the SAMSS must indicate the specific position (Standards Committee Chairman, Unit Supervisor, Division Coordinator, etc.) who is delegated this responsibility, and must direct the Company or Buyer Representative to forward all submittals to that position for further processing.

REFERENCES (As applicable)

List all documents that are referred to in the SAMSS. Do not list documents that are not referred to. Include the following requirement in this section:

"Material or equipment supplied to this specification shall comply with the latest edition of the references listed below, unless otherwise noted".

References are categorized by type under the following subheadings:

- Saudi Aramco documents
- Industry Codes and Standards
- Other References

[SAES-A-112](#), "Environmental and Seismic Design Criteria", has been developed to consolidate this information and should be referenced in SAMSSs and attached to purchase requisitions and orders, when environmental or seismic design criteria apply.

INFORMATION REQUIRED WITH QUOTATION (Optional)

This section is optional. It can be used to improve the quality of quotations received by Saudi Aramco, as well as the bid evaluations that are prepared. This section is especially applicable for material or equipment that are complex in nature (rotating equipment, electrical switchgear, etc.). Use the following paragraph, together with a list of information required to evaluate the Supplier's quotation.

"Supply the following information with the quotation. This information is necessary and will be used to complete the technical evaluation of the quotation. The quotation will be considered technically unacceptable if any of the information requested is not included".

QUALIFICATION (Optional)

This section is optional. It can be used to ensure the procurement of critical material or equipment that has demonstrated high levels of problem-free performance and the capability of achieving extended reliability and safe operation over its useful life at a minimum cost. Use the model paragraphs below to develop an appropriate set of requirements that can determine material or equipment qualification. Do the following to these paragraphs: (a) Specify the performance characteristics that apply to the SAMSS's material or equipment. (b) Adjust the number of units and time limits to achieve the level of confidence associated with the complexity and criticality of the material or equipment. (c) If an alternate method of qualification is not appropriate, delete the example shown. If an alternate method is appropriate, modify the example below or add other methods. (d) Add a list of those critical areas that will be used to

evaluate the material or equipment, and (e) indicate the specific position with the authority to decide on the acceptability and qualification of the material or equipment.

"Qualification: Material or equipment offered to meet the requirements of this specification must be qualified based on demonstrable operating experience. To qualify, the following criteria must be satisfied:

- At least (quantity) units with identical or equivalent performance characteristics (speed, power rating, discharge pressure, mass flowrate, etc.) must have been manufactured at the proposed location of manufacture and satisfactorily operated for at least (quantity) year(s).
- As an alternative, if all "equivalent performance characteristics" do not exist in an individual unit, qualification can be satisfied by demonstrating the experience in several units of a design similar to that proposed, that collectively cover the range of all characteristics. In this case, each of these units must still have satisfactorily operated for at least (quantity) year(s).
- Supply the following information on the performance and design of existing equipment for use in determining material or equipment qualification:

(List of information and evaluation requirements, such as this example taken from 31-SAMSS-001):

- o Pressure, relative molecular mass, volumetric capacity, power rating, speed, and temperature
 - o Sealing system, bearing design & loading, stage number & arrangement, casing size & design, rotor dynamics, impeller design & performance, material selection, etc.)
- Approval of material or equipment qualification will be determined by (indicate the specific position that will evaluate and approve)."

MODIFICATIONS TO INDUSTRY STANDARD (Mandatory)

Use the remainder of the document to identify the changes to individual paragraphs in the referenced industry standard. Begin the section with the following paragraph, inserting the name and number of the industrial standard in place of the parentheses.

"The following paragraph numbers refer to (industry standard) which is a part of this specification. The text in each paragraph is an addition, modification, exception, or deletion to the requirements of (industry standard), as noted."

COMMENTARY (Optional)

Section 3.4 of this procedure allows the use of short Commentary Notes that add information or requirement explanations to assist specification users in the proper interpretation and implementation of the document. Limit notes to essential information, without which there is a high probability of misinterpreting or misapplying the requirements. Locate the note immediately after the portion of the specification to which it applies. Begin the note with the word "COMMENTARY", and select an italics font for the note.

OTHER MISCELLANEOUS REQUIREMENTS (Optional)

Include at the end, any miscellaneous requirements that are not covered by the industry standard such as:

- Nonmaterial Requirements ("7900-series" NMR forms)
- Inspection and Testing ("175-series" forms)
- Packing Specifications ("8314-series" or "8444-series" forms)

Attachment II – Narrative Style Saudi Aramco Materials System Specification

In case an appropriate industry standard does not exist, or there are none considered Suitable for the Exception style format, write the SAMSS using the Narrative style format. Up to "Modifications to Industry Standard", the major sections in the body of this format are identical to and follow the same order as those shown in Attachment I. Select those "Optional" sections that apply to the material or equipment covered by the SAMSS, and add other sections as necessary.

TITLE AND TABLE OF CONTENTS (Mandatory)

SCOPE (Mandatory)

CONFLICTS AND DEVIATIONS (Mandatory)

[REFERENCES \(As applicable\)](#)

INFORMATION REQUIRED WITH QUOTATION (Optional)

QUALIFICATION (Optional)

GENERAL REQUIREMENTS (Optional)

(Use this section for definitions and for specifying other requirements of a general nature.)

MATERIALS (Optional)

(Use this section to cover mandatory material selection requirements.)

DESIGN (Optional)

(Use this section to cover mandatory design requirements.)

FABRICATION AND ASSEMBLY (Optional)

(Use this section to cover mandatory fabrication and installation requirements, including those that facilitate maintenance.)

TESTING AND INSPECTION (Optional)

(Use this section to cover testing and inspection requirements, with their associated acceptance criteria.)

||