

Engineering Standard

SAES-O-100

26 October 2005

General Requirements Safety and Security

Safety & Security Standards Committee Members

Ghabbani, A.A., Chairman

Al-Mugbel, W.M.

Al-Tuwaijri, A.I.

Al-Zahrani, H.S.

Fadley, G.L.

Lentz, S.A.

Solaiman, M.Z.

Welsh, D.

Saudi Aramco DeskTop Standards

Table of Contents

1	Introduction.....	2
2	Conflicts and Deviations.....	2
3	Cross Reference to the SAES-O Series.....	3
4	SSDs Compliance Guidelines.....	5
5	HCIS Involvement (SSD Modification).....	7

1 Introduction

- 1.1 The SAES-O Series of Saudi Aramco Engineering Standards have been established to clarify the technical requirements of the Safety and Security Directives (SSDs). These SSDs were received, in English, by Saudi Aramco from the Saudi Arabian Government High Commission for Industrial Security (HCIS).
- 1.1.1 SSDs numbers 1 through 27 and 29 shall be applied to the design of all new onshore Saudi Aramco industrial facilities designated as vital to the security of the Kingdom.
- 1.1.2 Ministry of Petroleum and Mineral Resources letter No. F/1400/609 shall be applied to the design of all new offshore Saudi Aramco industrial facilities designated as vital to the security of the Kingdom.
- 1.2 Vital is defined by the Secretariat, HCIS as:
- QUOTE "any piece of equipment vulnerable to sabotage, in or connected with a vital installation, where destruction or damage would result in unacceptable interruption of the installations services" UNQUOTE
- 1.3 A vital installation is defined as any installation deemed essential to the continued industrial productivity of the Kingdom and where destruction or damage to the installation would result in an unacceptable interruption of the industrial productivity of the Kingdom.
- 1.4 Purpose
- This engineering standard, in conjunction with SSDs 1 through 27, SSD 29 and letter F/1400/609, shall serve to incorporate additional design requirements for Saudi Aramco's vital industrial facilities to insure safe and secure operation of these facilities from any eventuality. To obtain copies of the SSDs, users are required to contact the Industrial Security Department in their respective areas.

2 Conflicts and Deviations

- 2.1 Any conflicts between all of SAES-O series standards and other applicable Saudi Aramco Engineering Standards (SAESs), Materials System Specifications (SAMSSs), Standard Drawings (SASDs), or industry standards, codes, and forms shall be resolved in writing by the Company or Buyer Representative through the Manager, Industrial Security Planning & Support Services Department (ISP&SSD) of Saudi Aramco.

- 2.2 Direct all requests to deviate from this standard in writing to the Company or Buyer Representative, who shall follow internal company procedure [SAEP-302](#) and forward such requests to the Manager, Industrial Security Planning & Support Services Department (ISP&SSD) of Saudi Aramco, Dhahran, who determines the nature of deviation, whether it should be addressed via section 4.4.2 or section 5 of this standard.

3 Cross Reference to the SAES-O Series

- 3.1 Listed below is a cross reference between the SSDs and the SAES-O Series. (There is not yet a corresponding SAES-O standard for SSD 29)

Safety and Security Directives (SSDs)		SAES-O Number
SSD/1	Standard Security Fence	SAES-O-101
SSD/2	Category II Fencing	SAES-O-102
SSD/3	Category III Fence	SAES-O-103
SSD/4	Category III Fencing Alternate	SAES-O-104
SSD/5	Gates in Perimeter Fences	SAES-O-105
SSD/5A	Gates in Woven Wire Fabric Fences	SAES-O-105A
SSD/6	Barbed S Wire Concertina	SAES-O-106
SSD/7	Security and Emergency Exit Doors	SAES-O-107
SSD/8	Minimum Standards for Locks Used on Security Doors, Perimeter Fences and Emergency Exits	SAES-O-108
SSD/9	Minimum Standards for Buildings Housing Sensitive or Vital Equipment	SAES-O-119
SSD/10	Protection of Vital Equipment	SAES-O-110
SSD/11	Power Supplies	SAES-O-111
SSD/12	Communications	SAES-O-112
SSD/13	Security Lighting Systems	SAES-O-113
SSD/14	Check Point Lighting	SAES-O-114

SSD/15	Intruder Detection Systems	SAES-O-115
SSD/16	Automatic Control of Entry (ACE) Systems	SAES-O-116
SSD/17	Gate House and Vehicle Lock	SAES-O-117
SSD/18	Fire Fighting Equipment	SAES-O-118
SSD/19	Work Permit Procedures	SAES-O-119
SSD/20	Expanded Steel Mesh - Dimensions	SAES-O-120
SSD/21	The Protection of Diesel Engines Fitted to Stationary and Mobile Equipment Operating in Hazardous Areas	SAES-O-121
SSD/22	Gasoline Filling Stations Constructed on Industrial Sites	SAES-O-122
SSD/23	Automatic Control of Entry	SAES-O-123
SSD/24	Turnstiles Used in Control of Entry	SAES-O-124
SSD/25	Internal Cleaning of Storage Tanks	SAES-O-125
SSD/26	Blast Resistant Control Rooms	SAES-O-126
SSD/27	Spacing/Dikes and Drainage	SAES-O-127
-	Offshore Requirements	SAES-O-128
SSD/29	Safe Design, Construction, Operation & Maintenance of Hydrocarbon Carrying P/Ls	SAES-O-XXX
ANNEX 1	Directive for Automatic Access Control Systems.	
ANNEX 2	Directive for Electromechanical Intruder Detection Systems, Electromechanical Fence Disturbance System.	
ANNEX 2A	Directives for Ported Coaxial Cable (Leaky Cables), Perimeter Intruder Detection System.	
ANNEX 3	Directives for the CCTV Monitoring System.	
ANNEX 4	Directives for Computer Managed Monitoring Systems,	

ANNEX 5 Directives for the Security Control System.

Commentary Note:

Ministry of Petroleum and Mineral Resources Letter No. F/1400/609 (July, 1980) is applicable for Offshore Requirements.

- 3.2 The above list comprises all SSDs received by Saudi Aramco up to the issuance date of this document.

4 SSDs Compliance Guidelines

- 4.1 The determination of which Saudi Aramco projects shall be considered vital to the Kingdom's security is presented in the following sections.

4.1.1 Vital Industrial Facilities shall include:

- a. All hydrocarbon projects.
- b. Communications projects.
- c. Computers controlling vital equipment or supplying sensitive information.
- d. Data acquisition centers controlling vital equipment or supplying key computers (e.g., SCADA Systems).
- e. Projects such as explosives storage.
- f. Marine installations (including offshore industrial plants).
- g. Bulk Plants components such as product storage tanks, product receiving areas via marine or pipeline, shipping pumps, shipping/receiving custody metering devices, launcher/receiver sites, transformers and emergency generators.

4.1.2 Examples of plant equipment that shall be considered VITAL are:

- a. Transformers
- b. Production Manifold
- c. Spheroid
- d. Hydrocarbon Launcher/Receiver Stations
- e. Hydrocarbon Metering Stations
- f. Electrical Switchgear

4.1.3 Examples of Plant equipment/buildings considered NON-VITAL are:

- a. Administration, Laboratory & Maintenance Building
-

- b. Drinking Water Storage Tank
- c. Chemical Injection Facilities
- d. Recreation Hall
- e. Dormitory
- f. Other Bulk Plants components such as truck off-loading (receiving) areas, truck loading (dispensing) and utility areas.

Commentary Note:

Items presented in 4.1.2 and 4.1.3 do not constitute a complete listing of vital or non-vital equipment.

- 4.2 Any existing plant or equipment considered vital by the proponent and by Facilities Planning Department (FPD), as defined in paragraph 1.2 and 1.3, is expected to be upgraded to the SSDs where required and/or when recommended by Industrial Security, after consultations with Consulting Services Department (CSD).
- 4.3 Where conflicts exist between the SSDs and Saudi Aramco Standards, the SSDs shall govern. Industrial Security is responsible for obtaining Arabic copies of the SSDs from HCIS when needed.
- 4.4 SSDs Application, Clarification, Interpretation, and Modification is as follows:
 - 4.4.1 Application of SSDs to new projects or existing plants that do not fall into the categories of paragraph 4.1.1 shall be addressed to the ISP&SSD Manager for review.
 - 4.4.2 Questions concerning any of the provisions of the SSDs shall be referred to the ISP&SSD Manager who will address the applicable security aspects and contact CSD Manager, if needed to handle concerns pertaining to applicable engineering aspects to satisfy the requirements of the SSDs. Clarification and/or interpretation of SSDs requirements shall be incorporated by the concerned organization into a concurrence letter to be signed by:
 - 1) Manager, CSD – If SSD requirements in question are related to engineering aspects
 - 2) General Manager, Industrial Security Operations
 - 3) Executive Director, Safety & Industrial Security
 - 4) Vice President, Engineering Services

In addition to the above signatories, the Manager, Loss Prevention Department (LPD) and the Executive Director, Safety and Industrial Security signatories shall be required on all concurrence letters concerning application, clarification, interpretation, and modification of the following SSDs:

- SSD-7 Security and Emergency Exit Doors
- SSD-8 Minimum Standards for Locks Used on Security Doors, Perimeter Fences and Emergency Exits
- SSD-9 Minimum Standards for Buildings Housing Sensitive or Vital Equipment
- SSD-18 Fire Fighting Equipment
- SSD-19 Work Permit Procedures
- SSD-21 The Protection of Diesel Engines Fitted to Stationary and Mobile Equipment Operating in Hazardous Areas
- SSD-22 Gasoline Filling Stations Constructed on Industrial Sites
- SSD-23 Automatic Control of Entry
- SSD-25 Internal Cleaning of Storage Tanks
- SSD-26 Blast Resistant Control Buildings
- SSD-27 Spacing/Dikes and Drainage

(Letter No.F/1400/609 Ministry of Petroleum and Mineral Resources - Offshore Requirements.)
- SSD-29 Safe Design, Construction, Operation & Maintenance of Hydrocarbon Carrying Pipelines.

5 HCIS Involvement (SSD Modification)

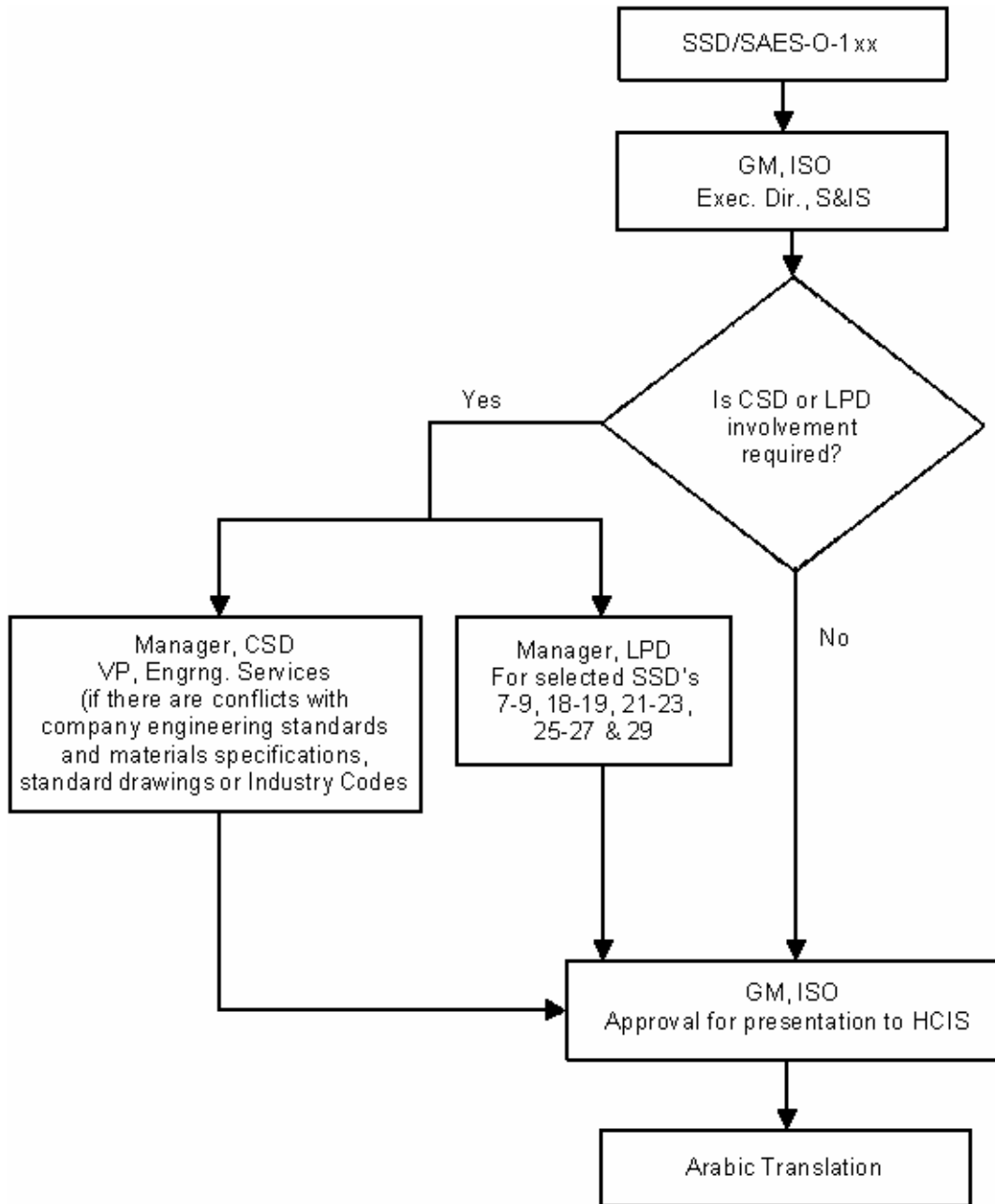
The SSDs are not subject to the Saudi Aramco waiver system as outlined in [SAEP-302](#), "Instructions for Obtaining a Waiver of a Mandatory Saudi Aramco Engineering Requirements". Any deviation from the SSDs which could not be settled via paragraph 4.4.2 above must be referred to the HCIS and written approval obtained from them on a case by case basis. The procedure is as follows:

- 5.1 Deviation and/or interpretation from/of the SSDs shall be presented, in written form, to the ISP&SSD Manager. This proposal, which must be endorsed by the proponent shall justify, in detail, the grounds of exception to the SSDs. The ISP&SSD Manager will review the proposal with the General Manager, Industrial Security Operations; the Executive Director, Safety & Industrial Security; and the Vice President, Engineering Services in case there are conflicts with company engineering standards and materials specifications, standard drawings or Industry Codes. If all agree that the proposal should be presented to the HCIS, then the proponent shall follow the procedure in Figure 1.
- 5.2 Precedents established from the procedure set forth in 5.1 shall be incorporated into later revisions of this document.

Revision Summary

26 October 2005 Revised the "Next Planned Update". Reaffirmed the contents of the document, and reissued with no other changes.

FIGURE-1 – Flow Chart for Saudi Aramco Contacts with the High Commission for Industrial Security⁽¹⁾



- Notes:**
- (1) Allow 4-6 months lead time.
 - (2) Saudi Aramco GA is responsible to distribute a copy of HCIS response to the proponent, CSD Manager, LPD Manager, General Manager, Industrial Security Operations, Executive Director, Safety & Industrial Security and Vice President, Engineering Services.