Engineering Standard

SAES-T-744 28 January, 2004
Design Criteria/Installation
of Communication Towers

Saudi Aramco DeskTop Standards

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Previous Issue: 29 August, 2001 Next Planned Update: 1 February, 2009
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1 Scope

1.1 This Standard covers mandatory requirements governing the design and installation of both self-supporting and guyed steel communication towers. This includes antenna towers used for HF, VHF/UHF, microwave, FM/TV broadcasting and CATV.

1.2 This Standard is not applicable to aluminum towers. Tubular steel pole structures are excluded from this standard.

2 Conflicts and Deviations

Any deviations, providing less than the mandatory requirements of this standard require written waiver approval as per Saudi Aramco Engineering Procedure SAEP-302.

3 References

The selection of material and equipment, and the design, construction, maintenance, and repair of equipment and facilities covered by this standard shall comply with the latest edition of the references listed below, unless otherwise noted.

3.1 Saudi Aramco References

Saudi Aramco Engineering Procedure

SAEP-302	*Instructions for Obtaining a Waiver of a Mandatory Saudi Aramco Engineering Requirement*

Saudi Aramco Engineering Standards

SAES-A-112	*Meteorological and Seismic Design Data*
SAES-B-063	*Aviation Obstruction Marking and Lighting*
SAES-H-001	*Selection Requirements for Industrial Coatings*
SAES-H-101	*Approved Protective Coating Systems*
SAES-O-102	*Category II Fence*
SAES-Q-001	*Criteria for Design and Construction of Concrete Structures*
SAES-Q-005	*Concrete Foundation*
SAES-T-887	*Telecommunications: Electrical Coordination – Protection at Power Plants and Radio Stations*

Saudi Aramco Standard Drawing

AA-036391	*Equipment Grounding System for Telecommunications Facilities*

Saudi Aramco Materials System Specifications

09-SAMSS-097	*Ready-Mixed Portland Cement Concrete*
12-SAMSS-007	*Fabrication of Structural and Miscellaneous Steel*

3.2 Industry Codes and Standards

Electronic Industries Association

TIA/EIA -222-F	*Structural Standards for Steel Antenna Towers and Antenna Supporting Structures*

4 Adoption

4.1 The Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222, Edition F, as published by Electronic Industries Association (EIA/TIA) is hereby adopted as Saudi Aramco Engineering Standard SAES-T-744, Design Criteria for Communication Towers.

4.2 Deviations to TIA/EIA-222 are identified as exceptions or additions in the Design section of this Standard.

5 Design

The Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, EIA/TIA-222-F is hereby adopted as Saudi Aramco Engineering Standard SAES-T-744 with the following addition or exception.

5.1 All material selection, detailing, shop fabrication, galvanizing, marking for erection, delivery, erection and assembly of steel structures for communications towers shall comply with 12-SAMSS-007.

5.2 Painting and protective coatings for steel structures of the towers shall also comply with SAES-H-001 and SAES-H-101.

5.3 Towers shall not contain hollow tubular steel members as part of their structure.

5.4 Ice loading shall not be considered in the tower loading calculations.

5.5 Section 16, County Listing of Minimum Basic Speeds shall not be considered. The basic wind speed for the location of the tower shall be determined from

SAES-A-112 using the fastest mile value. If such data is not available for a particular location, contact Environmental Engineering Division.

5.6 Loading capacity of the tower shall be calculated for the known loading to be on the tower at its commissioning plus any additional loading expected to occur within one year after commissioning.

5.7 Foundations and concrete shall comply with 09-SAMSS-097, SAES-Q-001 and SAES-Q-005.

5.8 To eliminate corrosion, all anchor rods shall be fusion bonded epoxy coated. The coating shall be 500 to 625 micrometers (20 to 25 mils) dry film thickness.

5.9 Guyed towers shall not be installed on offshore structures. Guyed towers shall use flexible anchor rods.

5.10 All guyed tower masts for communication sites require separate SSD/1 or SSD/2 security fencing for each guy if not included in perimeter security fence for tower. Refer to SAES-O-102.

6 Installation

6.1 All tower legs and anchors shall be bonded to form a grounding electrode system, which shall be bonded to the building grounding system per SAES-T-887 and Standard Drawing AA-036391.

6.2 Each tower leg and anchor shall be identified with labels. The labels shall be located in a clear location such as the bottom of the tower and top of anchor.

6.3 Marking and lighting of communications towers shall comply with SAES-B-063.

6.4 A tower safety zone shall be provided for communications facilities that have or planned to have towers. Tower safety zone is defined as a circular plot area with the center being at the tower base and a radius equals to tower height. No buildings or facilities other than communications facilities shall be built within the tower safety zone.

7 Testing and Inspection

Testing and inspection of towers shall be in accordance with section 14 and appendix E of EIA/TIA-222-F.

Revision Summary

28 January, 2004 Revised the "Next Planned Update". Reaffirmed the contents of the document, and

reissued with minor changes.