

-Unofficial translation-

Notification of the National Telecommunications Commission

On Technical Standards for Telecommunication Equipment

Re: Antennas of Earth Stations for Fixed-satellite Service Operating in Geostationary-satellite Orbit

---

Whereas it is deemed appropriate to prescribe technical standard for the satellite telecommunication service, and that the antennas used in the satellite telecommunication service, which could affect the provision of telecommunication services, shall conform to technical standard in order to eliminate any radio frequency interference, and to better utilize the geostationary-satellite orbit and radio frequency spectrum in an efficient manner;

Pursuant to Section 51 (6) (21) and Section 78 paragraph one of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunication Services B.E. 2543 (2000), which contains certain provisions regarding the restriction of the rights and freedom of an individual as permitted to be done under the law by Article 29, together with Articles 35, 36, 43, 45, 46, 47, 61 and 64 of the Constitution of the Kingdom of Thailand; and Section 32 of the Telecommunications Business Act B.E. 2544 (2001), which contains certain provisions regarding the restriction of the rights and freedom of an individual as permitted to be done under the law by Article 29, together with Articles 35, 36, 41, 43, and 45 of the Constitution of the Kingdom of Thailand, as well as Section 29 (4) of the Radiocommunications Act B.E. 2498 (1955), which contains certain provisions regarding the restriction of the rights and freedom of an individual as permitted to be done under the law by Article 29, together with Articles 35, 36, 41, 43, 45, 47, and 61 of the Constitution of the Kingdom of Thailand; the National Telecommunications Commission hereby repeals the Notification of the Post and Telegraph Department regarding the Use of Radio Frequency Spectrum for the Antennas of Earth Stations for Fixed-satellite Service dated 27 February B.E. 2540 (1997) and issues the Notification on Technical Standards for Telecommunication Equipment regarding Antennas of Earth Stations for Fixed-satellite Service Operating in Geostationary-satellite Orbit, as detailed in the NTC TS 1019-2551 appended hereto.

This Notification shall come into force as from the day following the date of its publication in the Government Gazette.

Announced on the 31<sup>st</sup> day of January B.E. 2551 (2008)

General Choochart Promphrasid

Chairman of the National Telecommunications Commission

---

This English version is prepared by International Organizations Bureau with the sole purpose of facilitating the comprehension of foreign participants in the telecommunication rules and regulations and shall not in any event be construed or interpreted as having effect in substitution for or supplementary to the Thai version thereof.

Please note that the translation has not been subjected to an official review by the Office of the National Telecommunications Commission. The Office of NTC, accordingly, cannot undertake any responsibility for its accuracy, nor be held liable for any loss or damages arising out of or in connection with its use.



# **Technical Standards for Telecommunication Equipment**

**NTC TS 1019 – 2551**

## **Antennas of Earth Stations for Fixed-satellite Service Operating in Geostationary-satellite Orbit**

**Office of the National Telecommunications Commission**

**87 Phahon Yothin 8 Road, Samsennai, Phayathai, Bangkok 10400**

**Tel. 0 2271 0151-60 Website: [www.ntc.or.th](http://www.ntc.or.th)**

**Technical Standards for Telecommunication Equipment**

**NTC TS 1019-2551**

**Antennas of Earth Stations for GSO FSS Service**

**Table of Contents**

<b>1. Scope</b>	<b>1</b>
<b>2. Technical Requirements</b>	<b>1</b>
2.1 Co-polarized radiation pattern	1
2.2 Cross-polarized radiation pattern	1
2.3 Cross-polarization discrimination	3
<b>Reference</b>	<b>4</b>

# Technical Standards for Telecommunication Equipment

## NTC TS 1019-2551

### Antennas of Earth Stations for GSO FSS Service

#### 1. Scope

This technical standard specifies the minimum technical characteristics of the antennas of earth stations for fixed-satellite service (FSS) operating in geostationary-satellite orbit (GSO) in the 2-30 GHz radio frequency bands.

This technical standard shall not apply to the following antennas:

- (1) TV receive only (TVRO) antennas, or other similar applications;
- (2) Antennas which are used as earth stations on board vessels (ESVs) as specified in the Radio Regulations of the International Telecommunication Union;
- (3) Antennas granted a license for making or import, or antennas not yet granted a license for making or import, but having entered into contracts or legal commitments before the date on which this Notification comes into force.

To demonstrate conformity with this technical standard, the equipment shall be categorized as Class A telecommunication equipment, as prescribed in the Notification of the National Telecommunications Commission regarding Conformity Assessment of Telecommunication Equipment.

#### 2. Technical Requirements

The antennas of earth stations for GSO FSS service shall conform to the following technical requirements:

##### 2.1 Co-polarized radiation pattern

The gain of antennas shall not exceed the following values, except for side-lobe, which may exceed the specified limit up to 10% (**Diagram 1**).

$G$	$= 29 - 25 \log \varphi$	dBi	for	$2^\circ \leq \varphi < 20^\circ$
	$= -3.5$	dBi	for	$20^\circ \leq \varphi < 26.3^\circ$
	$= 32 - 25 \log \varphi$	dBi	for	$26.3^\circ \leq \varphi < 48^\circ$
	$= -10$	dBi	for	$48^\circ \leq \varphi \leq 180^\circ$

##### 2.2 Cross-polarized radiation pattern

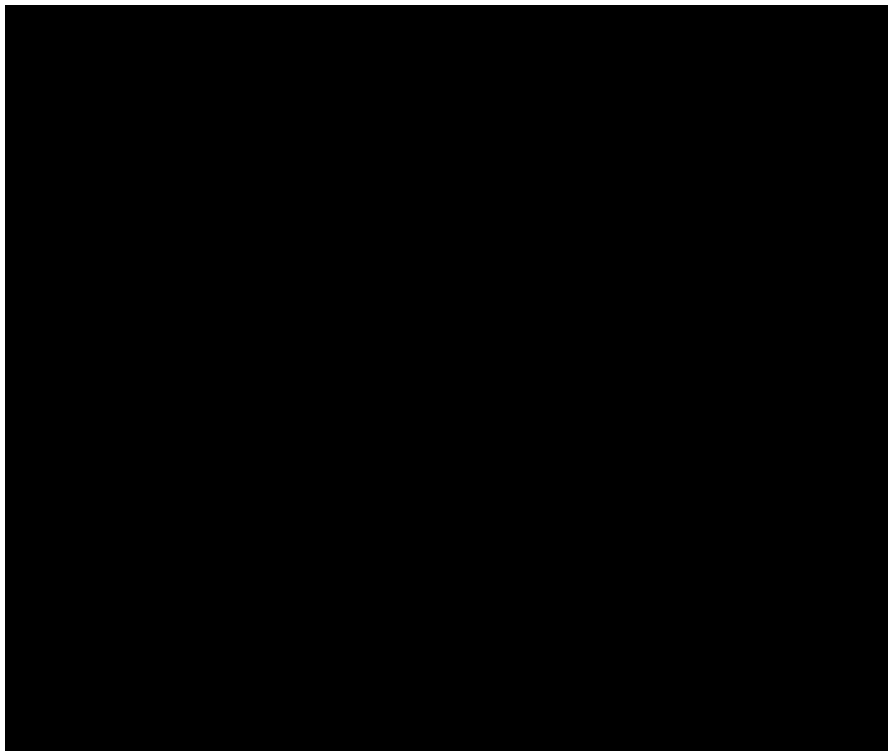
The gain of antennas shall not exceed the following values, except for side-lobe, which may exceed the specified limit up to 10% (**Diagram 2**).

$G$	$= 23 - 20 \log \varphi$	dBi	for	$2^\circ \leq \varphi < 7^\circ$
	$= 20.2 - 16.7 \log \varphi$	dBi	for	$7^\circ \leq \varphi \leq 20^\circ$

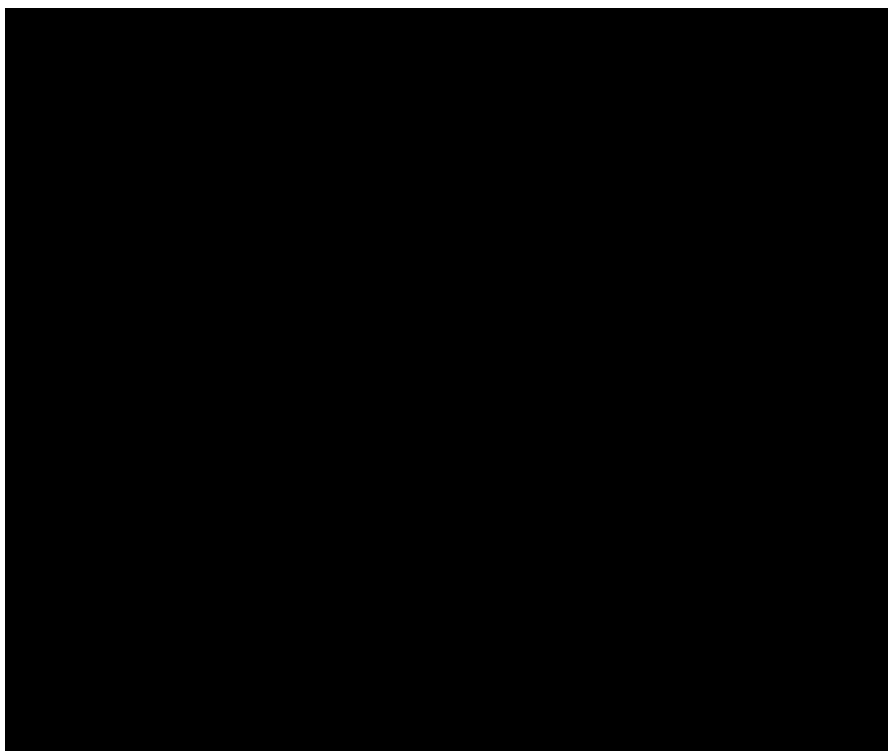
**Technical Standards for Telecommunication Equipment**

**NTC TS 1019-2551**

**Antennas of Earth Stations for GSO FSS Service**



**Diagram 1 Co-polarized radiation pattern**



**Diagram 2 Cross-polarized radiation pattern**

### 2.3 Cross-polarization discrimination

The value of cross-polarization discrimination of antennas at the operating frequency in any direction (ratio of the gain at the co-polar main-lobe axis to the cross-polar gain in that direction) within the virtual cone with its axis at the cone half-angle of the main-lobe axis equal to the BPE angle shall be at least the following values:

30 dB for the linear polarization, or

20 dB for the circular polarization,

Where  $G, G_x$  = gain relative to an isotropic antenna, measured in dBi

$\varphi$  = off-axis angle in the direction of the GSO referred to the main-lobe axis which is within  $3^\circ$  of the GSO, as illustrated in **Diagram 3**

BPE = Beam Pointing Error, which is the angle corresponding to the 1 dB contour of the pattern of the transmit beam at the operating frequency, measured in degree

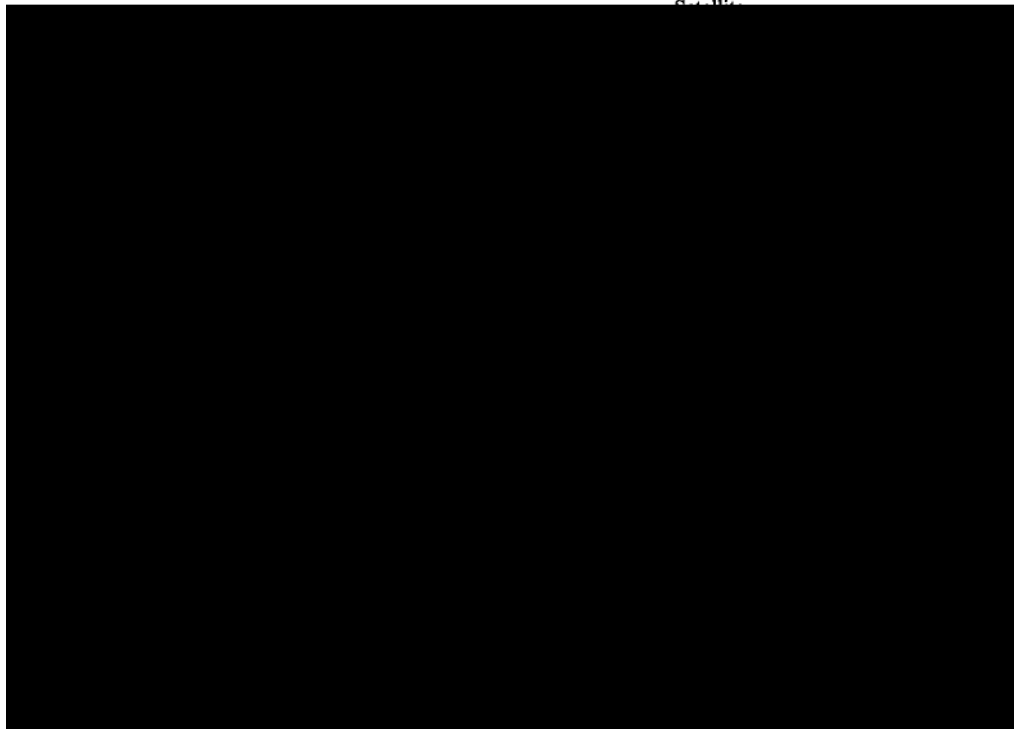


Diagram 3 GSO ARC

# **Technical Standards for Telecommunication Equipment**

## **NTC TS 1019-2551**

### **Antennas of Earth Stations for GSO FSS Service**

#### **Reference**

- [1] Recommendation ITU-R S.580-6: Radiation diagrams for use as design objectives for antennas of earth stations operating with geostationary satellites (2003)
  - [2] Recommendation ITU-R S.465-5: Reference earth-station pattern for use in coordination and interfering assessment in the frequency range from 2 to about 30 GHz (1993 with amendments in 2001)
  - [3] Recommendation ITU-R S.731-1: Reference earth-station cross-polarized radiation pattern for use in frequency coordination and interference assessment in the frequency range from 2 to about 30 GHz (2005)
  - [4] ETSI TS 101 136: Satellite Earth Stations and Systems (SES); Guidance for general purpose earth stations transmitting in the 5.7 GHz to 30.0 GHz frequency bands towards geostationary satellites and not covered by other ETSI specifications or standards (V1.3.1 2001-06)
-