- Unofficial translation -

Notification of the National Telecommunications Commission
On Technical Standards for Telecommunication Equipment
Re: Radiocommunication Equipment Operating in Maritime Mobile Service
In the VHF Frequency Band

Whereas the National Telecommunications Commission has issued the Frequency Plan for maritime mobile service in the VHF frequency bands (156.000 MHz - 162.050 MHz), and prescribed that radiocommunication equipment used in such service shall operate in the specified frequency bands and conform with the technical standards as prescribed by the National Telecommunications Commission;

Pursuant to Section 51 (6) (21) and Section 78 of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunication Services B.E. 2543 (2000), Section 32 paragraph one of the Telecommunications Business Act B.E. 2544 (2001), and Section 29 (4) of the Radiocommunications Act B.E. 2498 (1955), the National Telecommunications Commission hereby issues the Notification on Technical Standards for Telecommunication Equipment regarding Radiocommunication Equipment Operating in Maritime Mobile Service in the VHF Frequency Band, as detailed in the Standard No. NTC TS 1021-2550 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 8th day of November B.E. 2550 (2007)

General Choochart Promphrasid

Chairman of the National Telecommunications Commission

Technical Standards for Telecommunication Equipment

NTC TS 1021–2550

Radiocommunication Equipment Operating in Maritime Mobile Service in the VHF Frequency Band

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Technical Standards for Telecommunication Equipment

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Radiocommunication Equipment Operating in Maritime Mobile Service in the VHF Frequency Band

1. Scope

This technical standard specifies the minimum technical characteristics for radiocommunication equipment for maritime mobile service, with frequency modulation (FM) or phase modulation (PM) in the VHF frequency bands of 156.000 MHz - 162.050 MHz, with channel spacing of 25 kHz. The permissible operating channels are as shown in the Annex. Such radiocommunication equipment are used for coast station, ship station, and push-to-talk or hand portable station, whereby:

1) Coast station is a transceiver, fitted with an antenna socket for use with an external antenna, and intended for use at a certain, fixed location for communicating with a ship station.

2) Ship station is a transceiver, fitted with an antenna socket for use with an external antenna, for use on board a vessel, but not including a survival craft station.

3) Push-to-talk or hand portable station is a transceiver having an integral antenna or fitted with an antenna socket for use with an external antenna, or both, and intended for use as portable or hand-held device.

2. Requirements for Transmitter

2.1 Rated carrier power

Definition **Rated carrier power** is the average carrier power of the equipment delivered to the artificial antenna in the absence of modulation as declared by the manufacturer in the technical documents. The measured carrier power shall be within ± 1.5 dB of the rated carrier power.

Limit The permissible values of rated carrier power shall not exceed the values given in the table below:

Type of transmitter	Rated carrier power (watt)
Coast station	50
Ship station*	25
Portable station*	5

*Radiocommunication equipment for ship station and portable station shall have the capability to reduce the rated carrier power to below 1 watt.

2.2 Conducted spurious emissions

Definition **Conducted spurious emissions** are emissions at the antenna connector on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of--band emissions.

Limit The power levels of conducted spurious emissions within the frequency range of 9 kHz - 3 GHz shall be at least 43 + 10 log P (dB) or 70 dBc below the carrier power in the absence of modulation, whichever is less stringent, whereby P is mean power in watt.

2.3 Frequency error

Definition **Frequency error** is the difference between the measured carrier frequency in the absence of modulation and the nominal frequency of the transmitter.

Limit The frequency error shall not exceed ± 1.5 kHz.

2.4 Frequency deviation

Definition **Frequency deviation** is the maximum difference between the instantaneous frequency of the modulated radio frequency signal and the carrier frequency in the absence of modulation.

Limit The frequency deviation shall not exceed ± 5 kHz.

2.5 Adjacent channel power

Definition **Adjacent channel power** is a part of the total output power of a transmitter with the defined modulation, which falls within a specified passband centered on the nominal frequency of either of the adjacent channels. The power is the sum of the mean power produced by the modulation, hum, and noise of the transmitter.

Limit The adjacent channel power levels shall be at least 70 dB below the carrier power.

2.6 Audio frequency response

Definition **Audio frequency response** is the degree of closeness to which the frequency deviation of **the transmitter** follows the prescribed characteristics.

Limit The audio frequency response from 300 Hz to 3000 Hz shall not vary from the true 6 dB per octave pre-emphasis characteristics as referenced to the 1000 Hz level, as shown in the figure below:

3. Requirements for Receiver

3.1 Reference sensitivity

Definition **Reference sensitivity** is the minimum level of receiver input signal at a nominal frequency with specified modulation that will result in the standard SINAD at the output of the receiver.

Limit The maximum input signal level shall not exceed 0.50 microvolts (□V) at 12 dB SINAD.

3.2 Adjacent channel selectivity

Definition **Adjacent channel selectivity** is the capability of a receiver to receive the wanted modulated signal at the nominal frequency without exceeding a given degradation due to the presence of an unwanted modulated signal in the adjacent channel.

Limit The adjacent channel selectivity shall not be less than 70 dB.

3.3 Spurious response rejection

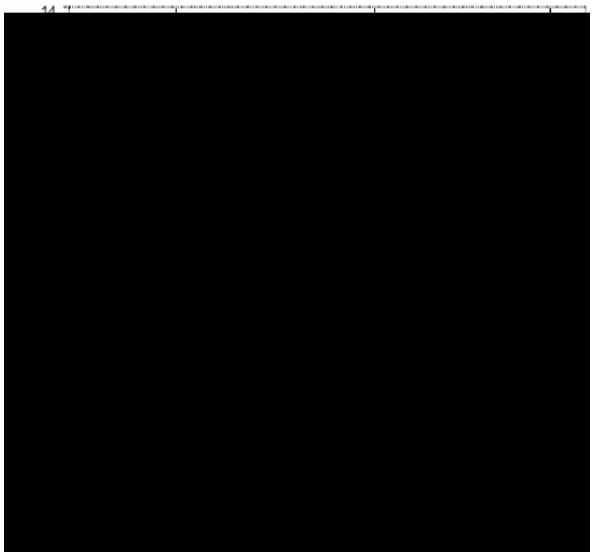
Definition **Spurious response rejection** is the capability of a receiver to distinguish between the wanted modulated signal at the nominal frequency and unwanted signals at other frequencies.

Limit At any frequency more than one channel away from the nominal frequency of a receiver, the ratio of spurious response rejection shall not be less than 70 dB.

3.4 Audio frequency response

Definition **Audio frequency response** is the degree of closeness to which the audio output of **a receiver** follows a 6 dB per octave de-emphasis curve with constant frequency deviation over a given continuous frequency range.

Limit The audio frequency response from 300 Hz to 3000 Hz shall not vary from the true 6 dB per octave de-emphasis curve as referenced to the 1000 Hz level, as shown in the figure below:



4. Safety Requirements

The electrical safety requirements of the radiocommunication equipment operating in maritime mobile service in the VHF frequency band shall conform to either of the following standards:

4.1.1 IEC 60950 - 1 : Information Technology Equipment – Safety - Part 1: General Requirements

4.1.2 TISI 1561 - 2548 : Information Technology Equipment – Safety: General Requirements

4.2 Radiation exposure requirements

The installation of a coast station and a ship station and the use of radiocommunication equipment operating in maritime mobile service in the VHF frequency band shall conform to the radiation exposure standard and requirements prescribed by the National Telecommunications Commission.

5. Methods of Measurement

5.1 Transmitter

5.1.1 Rated carrier power

The method of measurement shall follow ETSI EN 300 162-1 [1], IEC 61097-7 [2], AS/NZS 4415.2 [3], or any other equivalent method.

5.1.2 Conducted spurious emissions

The method of measurement shall follow ITU-R Rec. SM 329-10 [4], ETSI EN 300 162-1, IEC 61097-7, AS/NZS 4415.2, or any other equivalent method.

5.1.3 Frequency error

The method of measurement shall follow ETSI EN 300 162-1, IEC 61097-7, AS/NZS 4415.2, or any other equivalent method.

5.1.4 Frequency deviation

The method of measurement shall follow ETSI EN 300 162-1, IEC 61097-7, AS/NZS 4415.2, or any other equivalent method.

5.1.5 Adjacent channel power

The method of measurement shall follow ETSI EN 300 162-1, IEC 61097-7, AS/NZS 4415.2, or any other equivalent method.

5.1.6 Audio frequency response

The method of measurement shall follow ETSI EN 300 162-1, IEC 61097-7, AS/NZS 4415.2, or any other equivalent method.

5.2 Receiver

5.2.1 Reference sensitivity

The method of measurement shall follow ETSI EN 300 162-1, IEC 61097-7, AS/NZS 4415.2, or any other equivalent method.

5.2.2 Adjacent channel selectivity

The method of measurement shall follow ETSI EN 300 162-1, IEC 61097-7, AS/NZS 4415.2, or any other equivalent method.

5.2.3 Spurious response rejection

The method of measurement shall follow ETSI EN 300 162-1, IEC 61097-7, AS/NZS 4415.2, or any other equivalent method.

5.2.4 Audio frequency response

The method of measurement shall follow ETSI EN 300 162-1, IEC 61097-7, AS/NZS 4415.2, or any other equivalent method.

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References for Methods of Measurement

[1] ETSI EN 300 162-1 V1.4.1 (2006-05): Electromagnetic compatibility and Radio Spectrum Matters (ERM); Radiotelephone transmitters and receivers for the maritime mobile service operating in VHF bands; Part 1: Technical characteristics and methods of measurement

[2] IEC 61097-7 (1996-10): Global maritime distress and safety system (GMDSS) - Part 7: Shipborne VHF radiotelephone transmitter and receiver - Operational and performance requirements, methods of testing and required test results

[3] AS/NZS 4415.2:2003 Radiotelephone transmitters and receivers for the maritime mobile service operating in the VHF bands - Technical characteristics and methods of measurement Part 2: Major coast stations, limited coast stations, ship stations and handheld stations (non DSC)

[4] ITU-R Recommendation SM. 329-10: Unwanted emissions in the spurious domain

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Annex

Operating Frequency Bands for Radiocommunication Equipment

Operating in Maritime Mobile Service in the VHF Frequency Band

In accordance with the Notification of the National Telecommunications Commission

Regarding the Frequency Plan for Maritime Mobile Service

In the Frequency Band 156.000 MHz - 162.050 MHz

Channel designator	Transmitting frequencies (MHz)		Inter-ship	Port operations and ship movement		Public correspondence
	Ship stations	Coast stations		Single frequency	Two frequency	
60	156.025	160.625			X	X
01	156.050	160.650			X	X
61	156.075	160.675		X	X	X
02	156.100	160.700		X	X	X
62	156.125	160.725		X	X	X
03	156.150	160.750		X	X	X
63	156.175	160.775		X	X	X
04	156.200	160.800		X	X	X
64	156.225	160.825		X	X	X
05	156.250	160.850		X	X	X
65	156.275	160.875		X	X	X
06	156.300		X			
66	156.325	160.925			X	X
07	156.350	160.950			X	X
67	156.375	156.375	X	X		
08	135.400		X			
68	156.425	156.425		X		
09	156.450	156.450	X	X		
69	156.475	156.475	X	X		
10	156.500	156.500	x	X		
70	156.525	156.525	Digital selective calling for distress, safety and calling			
11	156.550	156.550		X		
71	156.575	156.575		X		
12	156.600	156.600		X		
72	156.625		x			
13	156.650	156.650	X	X		
73	156.675	156.675	X	X		

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Channel designator	Transmitting frequencies (MHz)		Inter-ship	Port operations and ship movement		Public correspondence
	Ship stations	Coast stations		Single frequency	Two frequency	
14	156.700	156.700		X		
74	156.725	156.725		X		
15	156.750	156.750	X	X		
75	156.775	160.775		X		
16	156.800	156.800	DISTRESS, SAFETY AND CALLING			
76	156.825			X		
17	156.850	156.850	X	X		
77	156.875		X			
18	156.900	161.500		X	X	X
78	156.925	161.525			X	X
19	156.950	161.550			X	X
79	156.975	161.575			X	X
20	157.000	161.600			X	X
80	157.025	161.625			X	X
21	157.050	161.650			X	X
81	157.075	161.675			X	X
22	157.100	161.700		X	X	X
82	157.125	161.725		X	X	X
23	157.150	161.750		X	X	X
83	157.175	161.775		X	X	X
24	157.200	161.800		X	X	X
84	157.225	161.825		X	X	X
25	157.250	161.850		X	X	X
85	157.275	161.875		X	X	X
26	157.300	161.900		X	X	X
86	157.325	161.925		X	X	X
27	157.350	161.950			X	X
87	157.375			X		
28	157.400	162.000			X	X
88	157.425			X		
AIS 1	161.975	161.975				
AIS 2	162.025	162.025				