Annex III

Technical details of sound signalling appliances

1. Whistles

(a) Frequencies and range of audibility

The fundamental frequency of the signal shall lie within the range 70-700 Hz.

The range of audibility of the signal from a whistle shall be determined by those frequencies, which may include the fundamental and/or one or more higher frequencies, which lie within the range 180-700Hz (± 1 per cent) for a vessel of 20m or more in length, or 180-2100 Hz(±1 per cent) for a vessel of less than 20 in length and which provide and provide the sound pressure levels specified in paragraph 1 (c) below.

(b) Limits of fundamental frequencies

To ensure a wide variety of whistle characteristics, the fundamental frequency of a whistle shall be between the following limits:

(i) 70-200 Hz, for a vessel 200 metres or more in length;

(ii) 130-350 Hz, for a vessel 75 metre but less than 200metres in length;

(iii) 250-700 Hz, for a vessel less than 75 metres in length.

(c) Sound signal intensity and range of audibility

A whistle fitted in a vessel shall provide, in the direction of maximum intensity of the whistle and at a distance of 1 metre from it, a sound pressure level in at least one 1/3rd-octave band within the range of frequencies 180-700 Hz (± 1 per cent) for a vessel of 20m or more in length, or 180-2100 Hz(±1 per cent) for a vessel of less than 20 in length, of not less than the appropriate figure given in the table below.

Length of vessel in metres	1/3rd octave band level at 1 metre in dB referred to 2x10-5 N/m2	Audibility range in nautical miles
200 or more	143	2
75 but less than 200	138	1.5
20 but less than 75	130	1
less than 20	120	0.5

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The range of audibility in the table above is for information and is approximately the range at which a whistle may be heard on its forward axis with 90 per cent probability in conditions of still air on board a vessel having average background noise level at the listening posts (taken to be 68 dB in the octave band centred on 250 Hz and 63dB in the octave band centred on 500 Hz).

In practice the range at which a whistle may be heard is extremely variable and depends critically on weather conditions; the values given can be regarded as typical but under conditions of strong wind or high ambient noise level at the listening post the range may be much reduced.

(d) Directional properties

The sound pressure level of a directional whistle shall not be more than 4 dB below the prescribed sound pressure level on the axis at any direction in the horizontal plane within ± 45 degrees on the axis. The sound pressure level at any other direction in the horizontal plane shall not be more than 10dB below the prescribed sound pressure level on the axis, so that the range in any direction will be measured in that 1/3rd-octave band which determines the audibility range.

(e) Positioning of whistles

When a directional whistle is to be used as the only whistle on a vessel, it shall be installed with its maximum intensity directed straight ahead.

A whistle shall be placed as high as practicable on a vessel, in order to reduce interception on the emitted sound by obstructions and also to minimising hearing damage risk to personnel. The sound pressure level of the vessel's own signal at listening posts shall not exceed 110 dB (A) and so far as practicable should not exceed 100 dB (A).

(f) Fitting of more than one whistle

If whistles are fitted at a distance apart of more than 100 metres, if shall be so arranged that they are not sounded simultaneously.

(g) Combined whistle systems

Is due to the presence of obstructions the sound field of a single whistle or of one of the whistles referred to in paragraph 1 (f) above is likely to have a zone of greatly reduced signal level, it is recommend that a combined whistle system be fitted so as to overcome this reduction. For the purposes of the Rules a combined whistle system is to be regarded as a single whistle. The whistles of a combined whistle system shall be located at a distance apart of

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not more than 100 metres and arranges to be sounded simultaneously. The frequency of any one whistle shall differ from those of the others by at least 10 Hz.

2. Bell or gong

(a) Intensity of signal

A bell or gong, or other device having similar sound characteristics shall produce a sound pressure level of not less than 110 dB at a distance of 1 metre from it.

(b) Construction

Bells and gongs shall be made of corrosion resistant materials and designed to give a clear tone. The diameter of the mouth of the bell shall be not less than 300 mm, for vessels of 20 metres or more in length. Where practicable, a power-driven bell striker is recommended to ensure constant force but manual operation shall be possible. The mass of the striker shall be not less than 3 per cent of the mass of the bell.

3. Approval

The construction of sound signal appliances, their performance and their installation on board the vessel shall be to the satisfaction of the appropriate authority of the State whose flag the vessel is entitled to fly.

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