Control of noise from public entertainment activities in Hong Kong

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ABSTRACT

Hong Kong is a vibrant and hyper-dense metropolitan city with over 7 million people being housed in a total area of around 1,100 square kilometers. In such a dynamic city, there is a huge demand of entertainment venues from the community for various kinds of entertainment. Due to the land sparsity, availability of appropriate venues is limited. Outdoor places for other uses, such as stadiums, parks, promenades and streets etc., are frequently used for holding public entertainment events, in particular, during various festivals. However, these open-air places are usually located in close proximity to residential premises. Noise from frequent public entertainment activities had aroused great concern from local residents. This paper describes the current framework and noise control criteria adopted in Hong Kong for controlling noise from open-air public entertainment activities with a view to striking a balance between the quest for quieter environment and the community's aspiration for enjoyment of public entertainment activities.

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1. INTRODUCTION

Being a bustling cosmopolitan city and having a multicultural society, Hong Kong is renowned for its abundance and diversity of public entertainment activities. These activities can range from funfairs, carnivals, cultural performances, religious activities, festive events, variety shows to international pop concerts and sports events, etc. Given the compact urban settings in Hong Kong, appropriate venues for holding these activities are not always available. Outdoor places such as stadiums, parks, promenades and streets are frequently used for holding public entertainment events, in particular, during various festivals. Most of these venues are located in close proximity to domestic premises. On the one side, there are residents requiring a reasonable tranquil environment for rest. On the other side, entertainment participants, especially the concert goers, would expect to have a reasonably high music volume for greater enjoyment. It is often a challenge for a vibrant city of this kind to strike a balance between the quest for a quieter environment and the participants' aspiration for enjoyment of these public entertainment activities. While those activities are often welcomed by their participants, their neighbours being affected also expect that adequate legal protection should be offered against excessive noise from the activities.

2. FRAMEWORK FOR CONTROLLING ENTERTAINMENT NOISE

2.1 Abatement Notice System

Noises from industrial/commercial premises including factories, restaurants, pubs/bars, and venues holding public entertainment activities are controlled by means of a Noise Abatement Notice (NAN) under the Noise Control Ordinance [1]. The Environmental Protection Department (EPD), being the control authority, may serve a NAN to the event organizer or the person-in-charge of the concerned premises when it is satisfied that noise emanating from there exceeds the limits stipulated

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in the relevant Technical Memorandum (TM) [2] issued under the Ordinance, or is a source of annoyance to any person in any place considered to be a Noise Sensitive Receiver (NSR) in the relevant TM. The NAN requires the compliance of the stipulated noise criteria or other relevant requirements within a specified time period. The recipient of the NAN who fails to comply with the requirements specified thereat would commit an offence under the Ordinance, and would be liable to a maximum fine of $100,000 Hong Kong Dollars upon first conviction, and a maximum fine of $200,000 Hong Kong Dollars upon second or subsequent conviction. There are, however, provisions for lodging an appeal against the service of NAN, within 21 days, to ensure that the requirements stipulated in the NAN are applied in a fair and reasonable manner. An Appeal Board is set up which has the power to confirm, reverse or vary the requirements relating to the NAN.

2.2 Noise Control Criteria

In general, noise from venues holding public entertainment activities such as funfairs, carnivals, cultural performances, variety shows, and sports events, etc. is governed by the noise limits stipulated in the TM. The TM provides guidance on the determination of the Area Sensitive Rating (ASR), in terms of Type A, B or C, for a particular NSR with reference to the types of areas (e.g. rural area, low density residential area or urban area) where the concerned NSR is situated, and whether or not there is existence of any influencing factors such as nearby industrial area or major road affecting the NSR. The determined ASR would then be used to establish the Acceptable Noise Levels (ANLs) of the NSR. Table 1 shows the ANLs stipulated in the TM for different ASRs for different time periods. The event organizer or the person-in-charge of the venue has to ensure that the noise emanating from the entertainment event as assessed at 1 meter from the exterior facade of the nearby NSR does not exceed the ANLs stipulated in the TM.

Table 1 – ANLs applied in Hong Kong in general

Time Period	ANLs in $L_{eq(30\ min)}$		
	Type A ASR	Type B ASR	Type C ASR
07:00 - 23:00 (Day & evening time)	60	65	70
23:00 – 07:00 (Night time)	50	55	60
Remarks: The noise descriptor $L_{eq(30\ min)}$ is 30-minute A-weighted equivalent continuous sound pressure level.			

The noise standards and assessment procedures set out in the TM could effectively deal with most of the noise situations for public entertainment activities. Nevertheless, some entertainment events may involve music, singing and instrument performing activities, which contain special noise characteristics with both musical and vocal contents much amplified through sound systems. Unlike the typical noise sources in industrial or commercial premises such as cooling chillers, ventilation systems, etc., which are essentially steady in nature, music noise varies greatly in time and often contains dominant low and high frequency components. Such transient and unique nature of music noise could cause annoyance to a NSR, yet may not be sufficiently reflected by using the above noise criteria. Thus, a set of separate control criteria, as shown in Table 2, is adopted for assessment of noise from public entertainment events involving music, singing and instrument performing activities. The control criteria are established with regard to the Hong Kong context and in line with the relevant overseas practice such as the relevant Code of Practice adopted in U.K. [3].

Table 2 – Control criteria for music noise from public entertainment activities

Time Period	Control Criteria
07:00 - 23:00 (Day & evening time)	$L_{eq(15\ min)}$ at any NSR should not be more than 10dB(A) above the prevailing background noise level measured in $L_{eq(5\ min)}$
23:00 – 07:00 (Night time)	Not audible within any NSR
Remarks: The noise descriptors $L_{eq(15\ min)}$ and $L_{eq(5\ min)}$ are 15-minute and 5-minute A-weighted equivalent continuous sound pressure levels, respectively.	

For unique community event that is supported by the majority of local community, i.e. New Year Eve Countdown, the above noise control criteria would be pragmatically adjusted to take into account the peculiarity of the event. The applicable time period of the noise control criterion for day

and evening time would be extended to 00:15 hours on the next day, and the inaudible criterion would be applicable thereafter till 07:00 hours.

3. PRE-EMPTIVE APPROACH

Most of the public entertainment activities are of one-off nature and are held outside normal office hours. It would be more effective for the organizers to well plan ahead their venue design to prevent excessive noise than to rectify adverse situations identified through EPD's enforcement actions in response to complaints of noise from entertainment activities. Therefore, usually for large scale activities, EPD adopts a pre-emptive approach to help organizers to prevent occurrence of noise disturbance by playing an active role in the planning stage of the entertainment activities through continuous liaison with the venue owners/event organizers. When approached, EPD would advise the venue owner or event organizer on the control criteria of entertainment noise and possible noise mitigation measures during the event planning stage. Typical advice include careful selection of the locations and orientation of the performance stage and loudspeakers; self-monitoring of the noise level for immediate rectification; provision of a manned hotline to deal with noise complaint; advanced notification to nearby residents; limitation on time periods for rehearsals; etc. Site specific control measures would also be recommended with due consideration of the nature of the event, the potential noise impact, frequency of occurrence, and precedent complaint history, etc. The venue owners concerned would normally impose such control measures as part of the requirements in the leasing conditions to the entertainment event organizers. For some specific noisy entertainment events without sufficient mitigation measures, or with unsatisfactory complaint history, it was not uncommon that those venue owners refused to grant the leasing of the venues to the applicants.

4. CASE STUDY FROM A CHINESE OPERA PERFORMANCE

Noise disturbance from public entertainment events could be prevented by better planning and management. Notwithstanding the above-mentioned practice, EPD would proactively liaise with event organizers in the planning stage to ensure that the noise impact could be minimized. The ensuing paragraphs illustrate the preventive measures taken in a Chinese opera performance as a result of the successful liaison between EPD and the event organizer, which had helped minimize the noise impact to nearby residents without compromising the participants' enjoyment of the public entertainment event.

A proposal of Chinese opera performance in a temporarily idle construction site during Chinese New Year was received by EPD (Figure 1). The event organizer proposed to build an 800-seating bamboo theatre for the Chinese opera performance in the site. The site had an area of about 10,000 square meters and was about 40 meters from its neighboring residential premises (Figure 2). Being inscribed in the list of Intangible Cultural Heritage of Humanity by United Nations Educational, Scientific and Cultural Organization, traditional Chinese opera performance blends music, song, dance, martial arts and acrobatics into its vibrant and usually loud performance. It was anticipated that if noise from the performance was not well controlled, it would arouse great concern from nearby residents.

Figure 1 – The temporarily idle construction site

Figure 2 – Plan view of the site and the nearby residential premises

In view of the potential noise impact, the event organizer was advised to adopt appropriate measures to minimize noise and to follow the respective noise control criteria for music noise, i.e. background noise level + 10dB(A) for day and evening time periods, and not audible for nighttime. Since there is a busy traffic road in the vicinity of the residential premises, the prevailing background noise level measured at the nearby residents was 65dB(A), which gave the corresponding day and evening time noise limit of 75dB(A) for this event.

Traditional Chinese opera performance is held in bamboo theatre, which would provide good natural ventilation, but would be inevitably ineffective in screening noise. Thus, in addition to the traditionally built cover made of metal sheet, the event organizer was also advised to install an extra layer of metal sheet on the bamboo theatre for those sides facing the nearby residential premises (Figure 3) for strengthening its noise screening effect.

Figure 3 – Bamboo theatre with double layer of metal sheeting

To ensure that noise from the Chinese opera performance would be effectively screened by the double-layer metal sheet facing the nearby residential premises, the noise levels in the surrounding of the theatre were recorded during its rehearsal. Five measurement points were chosen (Figure 4).

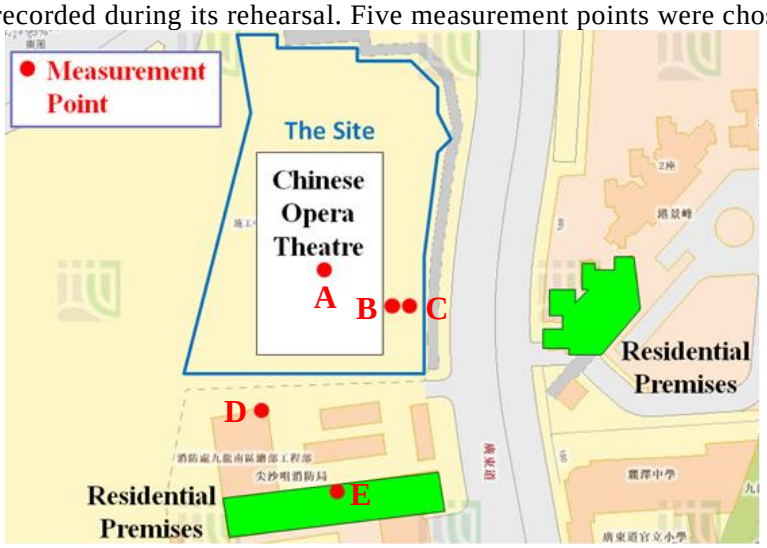

Figure 4 – Noise measurement locations

The potential noise impact was assessed by a mock concert/performance using a loudspeaker to play back the traditional Chinese opera music and Western pop music. The measurement results are shown in the table below:

Table 3 – Measurement results of noise impact from metal-sheeted bamboo theatre

Measurement Point (Remarks)	Noise Levels in dB(A) (Corrected by the Prevailing Background Noise Levels)	
	Chinese Opera Music	Western Pop Music
A (Inside the theatre)	87	91
B (Next to the access door)	79	79
C (Further away from the access door)	74	75
D (Around 15m above ground)	72	71
E (Around 25m above ground)	66	62

The measurement results from Points B and C indicated that the metal sheeting had been effective in attenuating noise from the theatre, with Point A showing that the music being played in the theatre reached at least 87dB(A). The noise attenuation results were further confirmed by assessments at Points D and E. Point D was a reference location between the NSR and the theatre, whereas Point E was a NSR. Results from both Points D and E showed that the noise from this performance had been well below the day and evening time noise limit of 75dB(A) for this event. To ensure the compliance of night time noise limit, the organizer was also required to end the event before 23:00 hours.

With the implementation of appropriate noise mitigation measures and noise monitoring, the performance was successfully held in 2012 and EPD did not receive any noise complaint against the event from the neighbourhood.

5. CONCLUSIONS

In a compact environment like Hong Kong, noise from public entertainment events is often the concern of the community. Instead of taking reactive actions, which are not effective for this kind of one-off events, after receiving complaints, EPD adopts a pre-emptive approach to prevent excessive noise from such activities. The example on Chinese opera performance illustrates the effectiveness of proactive measures in minimizing noise impact. It is believed that, through EPD's continuous surveillance and joint effort with the event organizers, the general expectation of entertainment enjoyment and the local aspiration on quiet environment could be sustainably balanced.

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[The opinion in this paper are those of the authors and do not necessarily reflect the views or policies of the Government of the Hong Kong Special Administrative Region of the People's Republic of China.]

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