1. INTRODUCTION

The client, Architectural Services Department (ASD) concerned whether there is emission of odour from a newly built crematorium, which is equipped with advanced cremation system. The objective of the study is to evaluate the odour level in the flue gas emission under normal operation status of a new advanced cremator at Kwai Chung Crematorium during testing and commissioning stage. Hong Kong Productivity Council (KPC) was commissioned by the client to carry out the odour measurement. This measurement report details the methodology and finding of the odour measurement.

2. METHODOLOGY OF THE MEASUREMENT

2.1 Collection of Flue Gas Samples

Hong Kong Polytechnic University (HKPU) was commissioned by HKPC to assist in carrying out the odour measurement. HKPU was responsible for collecting flue gas samples at the flue gas ductwork downstream of the air pollution control system serving the new cremator at Kwai Chung Crematorium. Flue gas sample was collected with a 50 L tedlar air sampling with a vacuum sampling chamber. Three separate air samples were collected during the commissioning test of the cremator. The sampling for each of flue gas sample was 15 minutes. The schedule of the flue gas sampling is summarized in Table 1.

Table 1 Summary of Flue Gas Sampling for Odour Measurement

Sample No.	Sample ID	Date of Sampling	Time of Sampling	Sampling duration
1	HKPC-C1-1	2003/1/20	09:45 – 10:00	15 minutes
2	HKPC-C1-2		10:00 – 10:15	15 minutes
3	HKPC-C1-3		10:15 –10:30	15 minutes

As the cremator was tuned at the design operating conditions during the testing and commissioning test, the performance of the cremator with respect to odour emission level is considered representative of the normal operation of the cremator when it is put to normal daily operation.

2.2 Condition of the Cremator Under Test

During sampling, the cremator was under commissioning test. A dead human body with a coffin was under normal cremation process. The crematorium operator reported that the cremator was operating normally during the commissioning test and the air pollution control system was also working properly. The air pollution control system consists of a lime injection system and a bag filter, which is effective to reduce the emissions of air pollutants and odour. As the cremator was under normal operation conditions, the flue gas samples collected are considered as representative of the normal operation of this type of cremator.

2.3 Analysis of Flue Gas Samples

The three air samples were delivered to the HKPU Odour Research Laboratory and analyzed on the same day. The odour level of flue gas samples was determined by a forced-choice Dynamic Olfactometer in accordance with the Dutch National Standard (NVN 2820). Seven qualified odour panelists participated in the odour testing. The panelists were carefully selected and received proper training on odour assessment. A screening test was also carried out with a 50 ppm of certified n-butanol gas as a standard reference sample for screening the odour panelists for the odour test.

3. RESULTS OF THE ODOUR MEASUREMENT

The odour measurement results are summarized in Table 2. The detailed laboratory report is enclosed in Appendix A.

Table 2 Summary of Odour Measurement

Sample No.	Sample ID	Date of Sampling	Time of Sampling	Odour Level (Odour Unit, OU)
1	HKPC-C1-1	2003/1/20	09:45 – 10:00	210
2	HKPC-C1-2		10:00 – 10:15	325
3	HKPC-C1-3		10:15 –10:30	187
			Overall Odour Level	***234***