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Panel on Environmental Affairs and
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Updated background brief on Clinical Waste Control Scheme

Background

Clinical wastes refer to substances generated in clinics, hospitals, laboratories and other medial sources in connection with dental, medical, nursing, veterinary or other practices involving medical treatment, or pathological or pharmaceutical research. As clinical wastes are potentially hazardous and infectious, safety precautions are in place for handling, transporting, storing and disposing of clinical waste to protect the public, healthcare workers and waste management operators.

2. In 1998, about 2 600 tonnes of clinical waste were generated. Of these, about 1 900 tonnes were disposed of in landfills and about 700 tonnes were burnt in pathological waste incinerators in 10 hospitals prior to landfilling. A small amount of human body parts was incinerated in the two crematoria managed by the Food and Environmental Hygiene Department. To reduce the amount of clinical waste to be disposed of at landfills, the Hospital Authority (HA) hospitals, registered private hospitals and Government clinics which account for about 80% of the clinical waste produced have introduced measures to segregate clinical waste from municipal waste. HA was able to reduce the amount of clinical waste requiring disposal from about 12 tonnes per day in 1989 to 3.3 tonnes per day in 1999. However, practice varies among minor waste producers such as private medical practitioners and laboratories.

Clinical Waste Control Scheme

3. In October 1997, the Administration announced its intention to introduce a clinical waste control scheme to -

(a) properly segregate clinical waste to avoid mixing with municipal waste;

(b) properly store, package and label segregated clinical waste;

(c) introduce proper guidelines and precautions to ensure safe collection and transportation; and

(d) dispose of clinical waste in such a way to ensure complete destruction of dangerous pathogens, remove the risks associated with sharp materials and address community concerns about proper disposal of human body parts.

4. The Administration consulted 32 organizations covering the medical, dental, pharmaceutical and veterinary sectors, tertiary and research institutions as well as the waste collection trade on the proposed scheme. According to the Administration, although reaction to the scheme were mixed, the major clinical waste producers were generally supportive of the arrangements.

5. When the proposed scheme was examined by the Environmental Affairs Panel and the Health Services Panel, interested parties, including Greenpeace, had been invited to express their views. The Panels noted the opposing views from the Greenpeace which considered medical waste incineration a leading source of both dioxin and mercury pollution. They suggested that efforts should be made to reduce clinical waste by using more reusable items and minimizing packaging and buying products that were durable rather than disposable. Clinical waste should be segregated from the municipal waste so as to minimize the amount of wastes that required special disposal treatment.

6. The Administration also concurred that waste separation, reduction and reuse were the key strategies in clinical waste management, and these had already formed part of the framework in the clinical waste control scheme and waste management in general. They however advised the Panels that the incinerator in Chemical waste Treatment Centre (CWTC), which comprised a rotary kiln, a secondary combustion chamber and an air pollution control system, was designed and equipped to handle all types of clinical wastes. The rotary kiln and the combustion chamber could operate up to 1 200 degrees Celsius at which temperature all hazardous chemicals such as dioxins were destroyed. The air pollution control equipment would also be able to control the mercury level in the stack gas to be within the statutory emission limit.

7. Apart from incineration, Greenpeace considered that the Administration should explore alternative treatment technologies that could sterilize and reduce the volume of medical waste without incineration. These technologies included autoclaving, microwave systems and chemical disinfection equipment. The Administration however held the view that the environmental risks in using large-scale autoclaving, microwave systems and chemical disinfection equipment for treating clinical waste was not well documented. Such treatment methods might emit unknown volatile organic compounds which could be equally hazardous. Besides,

they could not treat all types of clinical wastes such as the physical hazards of sharps and the obnoxious nature of amputated human limbs nor achieve the same volume reduction as incineration.

Assessment of dioxin emissions in Hong Kong

8. In deciding the way forward on waste incineration, the Administration subsequently commissioned a consultancy study on dioxin emissions and the health risks associated with dioxin emissions in Hong Kong. An independent international expert was also invited to review the consultant's assessments.

9. The consultant's report on dioxin emissions in Hong Kong was examined by the Environmental Affairs and the Health Services Panel in May 2000 It revealed that -

(a) ambient dioxin concentration in Hong Kong was comparable to the levels in many urbanized cities;

(b) dioxin emissions had been reduced over the past few years with the decommissioning of old municipal waste incinerators;

(c) less than 2% of human dioxin intake was from direct inhalation;

(d) contribution to dioxin in food from local emissions was insignificant as food items were mainly imported into Hong Kong;

(e) CWTC contributed only about 0.1% to 0.4% to the background dioxin level;

(f) incineration of clinical waste at CWTC was not likely to increase the background concentration of dioxins to any significant extent if the current emission and combustion practices were adopted;

(g) additional monitoring of dioxins should be conducted on soil, dust and vegetation in the vicinity of the existing and future facilities on a biannual basis;

(h) a food surveillance programme should be implemented on imported and locally produced food; and

(i) no one incineration facility should contribute more than 1% to the background ambient air concentration of dioxin on an annualized basis and detailed checks on the operation and control measures in incineration facilities should be carried out when the dioxin levels reaches two nanogramme I-TEQ per cubic metre of emission.

It was also noted that the independent reviewer generally agreed with the findings of the consultant, adding that diet was the most important route for exposure to dioxin, which accounted for 90% to 98% of dioxin intake according to overseas findings. He also concurred that the dioxin emissions in Hong Kong complied with the tolerable range proposed by the World Health Organization, that the records on ambient air values in Hong Kong were comparable to many other countries, and that there was a need to fill the information gap on dietary intake of dioxin in Hong Kong.

10. While appreciating that the report had provided useful data on dioxin emissions in Hong Kong, members of the Panels held the view that the Administration should explore other alternatives to incineration. According to the Administration, the amount of waste produced daily in Hong Kong was enormous given its dense population and vibrant economic activities. It was therefore necessary to have in place an effective waste disposal method to reduce the bulk of waste without causing damage to the environment. Although the report did provide useful information on waste management facilities, including clinical waste incineration, this had to be considered in the context of the overall waste management strategy. Besides, any major waste management proposal would be subject to comprehensive environmental impact assessment.

11. As regards the concern on the lack of comprehensive data on dioxin levels in food consumed in Hong Kong, the Administration's response was that consideration was being given to introducing a comprehensive food monitoring programme to categorize and test the food consumed by Hong Kong people. This would be a difficult exercise as most of the food items were imported in Hong Kong and the sources changed frequently.

Latest development

12. The revised proposal for the control of the collection and disposal of clinical waste as well as the outcome of the review of treatment technologies were discussed by the Panels at a joint meeting on 20 March 2002.

13. On the revised Control Scheme, it comprises the following key elements -

(a) establishing a statutory licensing framework to regulate the handling of clinical waste by collectors and disposal of facility operator(s);

(b) requiring clinical waste producers to consign waste of more than five kilograms to licensed waste collectors;

(c) issuing codes of practices to provide guidance on segregation, packaging, labelling, collection, handling, storage, transportation and disposal of clinical waste;

(d) putting in place a trip ticket system to track the movement of clinical waste from its source to the disposal facility; and

(e) requiring clinical waste producers to pay a charge to cover part of the waste disposal cost.

14. Concern has been raised on the management and collection of clinical waste, particularly in view of the small amount of clinical waste produced by an average clinic as it will not be cost effective to arrange for daily collection and disposal of waste On the other hand, any accumulation of infectious clinical waste will not be desirable. According to the Administration, waste producers can deliver not more than five kilograms of clinical waste to CWTC or authorized collection points set up by waste collectors or individual waste producers subject to the approval of the Director of Environmental Protection. As regards the licensing framework to regulate the handling of clinical waste by collectors and disposal facility operators, it will be modelled after that for chemical waste collection. The system will come into operation in two years' time and meetings have been held between the Administration and the nine existing waste collectors to facilitate a better understanding of the statutory licensing framework.

15. Question has also been raised on the financial implications of the revised Control Scheme. According to the Administration, the Scheme is based on a user-pays principle with a view to creating economic incentive for waste reduction and segregation. The charging mechanism follows that of land-based chemical waste treatment at CWTC viz the Administration will recover 31% of the variable operating cost as a start, gradually raising it to a full recovery. It is expected that a charge of less than $3 per kilogram, or less than $35 each month for an average clinic that produces 0.4 kilogram of clinical waste each day. The disposal cost is to be added on to the existing collection charges which range from $30 to $300 per month.

16. On the review of treatment technologies, it has examined a number of technologies, including chemical disinfection, thermal disinfection, thermal disinfection and novel treatment technologies. After taking into account their health, safety and environmental impacts, efficacy in killing infectious microorganisms, reliability and ease of maintenance, weight and volume reduction of waste, handling of residues and further treatment requirements, space requirements, public perception of risk, as well as their costs and financial implications, it is recommended that CWTC be modified for treating clinical waste as a medium-term solution.

17. As incineration is a source of dioxin emission, it is proposed that consideration should be given to segregating clinical waste so that only cytoxic drugs, human tissue and body parts, pharmaceuticals and chemicals will be incinerated. Other clinical waste can be treated by less polluting treatment methods such as thermal disinfection. According to the Administration, most of the thermal disinfection processes require pre-treatment shredding which will pose occupational safety hazards to works.

Moreover, vapour will be formed during the process, and residual chemicals and volatile organic compounds in the waste that cannot be destroyed under low temperature will be vaporized and escape into the environment. The review therefore concludes that thermal disinfection is not yet a satisfactory treatment method at the moment. Nevertheless, the use of alternative treatment method can be considered in the light of further advancement in treatment technology.

18. On the research study on dioxin content in human bodies, it is noted that the study will complete in early 2003 and the Administration will inform the Panels of the findings in due course.

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