

**Extracts from the minutes of the meeting  
of the Environmental Affairs held on 19 March 2001**

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**VI Removal of low-level radioactive waste**

- (LC Paper No. CB(1) 801/00-01(05) -- Expert views from Professor Jonathan SHAM, The University of Hong Kong
- LC Paper No. CB(1) 801/00-01(06) -- Expert views from Mr C L CHAN, Chairman of Hong Kong Association of Medical Physics
- LC Paper No. CB(1) 801/00-01(07) -- Expert views from Dr Sherry NG, Chairman of Hong Kong Radiation Protection Society
- LC Paper No. CB(1) 801/00-01(08) -- Information paper provided by the Administration)

Background

30. Mr Martin LEE considered that it was the responsibility of the Government to ensure proper storage of radioactive wastes. He recalled that the proposal of constructing a purpose-built storage facility at Siu A Chau had the in-principle support from members. The tender for the facility was put up in 1995 but it was subsequently cancelled after failing to reach an agreement with the tenderer on tender price in 1997. Since then, not much progress had been made except for the recent negotiation with the Mainland authorities on the technical feasibility of storing the wastes in a purpose-built facility in the Mainland. He expressed concern about the impact of the storage of radioactive waste in the air-raid shelter at Queen's Road East in Wan Chai on the health of students of the Wah Yan College (WYC) and queried why no positive action had been taken since 1997.

31. The Principal Assistant Secretary for the Environment and Food, (B) 2 (PAS/EFB (B)2) assured members that the low-level radioactive wastes stored in the air-raid shelter at Queen's Road East in Wan Chai would not pose health or safety hazards to people nearby. She added that since the cancellation of the tender exercise for the purpose-built storage facility at Siu A Chau in 1997, there had been a substantial decrease in the volume of low-level radioactive wastes produced because a major manufacturer had stopped its production line in Hong Kong. Notwithstanding, it remained the Government's intention to relocate these wastes to a purpose-built storage facility in the long run. In 1998, the Administration put forward the proposal of storing the radioactive wastes in purpose-built facilities in the Mainland. It was in late 1999 that the Mainland was able to nominate the responsible authorities to co-ordinate the matter. Two meetings with the relevant authorities on the technical feasibility of storing the radioactive wastes in purpose-built facilities in the Mainland were held in 2000. It was hoped that with more information collected within this year, the Administration could consider this option together with the Siu A Chau option before making a decision.

32. Miss CHOY So-yuk expressed grave dissatisfaction at the delay in resolving the problem arising from storage of low-level radioactive wastes. She did not accept the Administration's assertion that the radioactive wastes posed no safety hazard and demanded that a target date be set for the removal of these wastes from its existing storage in Wan Chai. She said that if these wastes could not be removed by the target date, consideration should be given to storing them in the Central Government Offices. Referring to the letter from Professor SHAM of the University of Hong Kong (CB(1) 801/00-01(05)), the Deputy Secretary for the Environment and Food (DSEF) noted that despite the wastes were packaged in a way which posed no safety threat, there were psychological concerns on the effects of radiation. He agreed that it would be best to relocate the wastes to places away from human habitation. In fact, the Administration had gone to great lengths in the 1990s in finding a place which was away from human habitation and unlikely to be so occupied in the future. Although a site had been identified, the cost of building a purpose-built storage facility was very high. This warranted the need to look for other alternatives, particularly when the amount of radioactive wastes had been decreasing due to a reduction in industrial activity. After the handover in 1997, the Administration had been discussing with the Mainland authorities on the feasibility of storing the radioactive wastes in purpose-built facilities in the Mainland. The timetable for the removal of wastes from Wan Chai would depend on whether the Mainland authorities were prepared to accept the wastes. If so, the removal could be effected quickly as facilities for storage were readily available in the Mainland. It would however take about two and a half years if Hong Kong were to build its own storage facility.

33. The Senior Physicist i/c(SP) added that in storing the radioactive wastes, care had been taken to ensure that there would be no adverse impact on those working in the storage facility nor on the surrounding environment. The air-raid shelter provided an extremely effective shielding of radiation from the wastes. On the basis of an inverse square reduction by distance and that every 30 millimetres of rock could reduce the intensity of even the highest energy gamma rays emitted from the wastes to one-tenth of its initial intensity, the air-raid shelter in Wan Chai with a minimum rock-wall thickness of 20 metres should be able to reduce the intensity of gamma rays by  $10^{75}$  times. The residual emission was practically close to zero. The storage of radioactive wastes at the present location would pose no health impact on those working in the facility nor on the surrounding environment.

34. Ir Dr Raymond HO however pointed out that there remained the concern on exposure as the radiation intensity was only close to but not actually zero. He added that the public had legitimate concerns about radiation, particularly when its effects were not entirely known. Expressing similar views, Mr Henry WU said that while there had been sufficient shielding within the air-raid shelter to prevent radiation leaking to the surrounding environment, efforts should be made to step up security control to guard against unauthorized entry to the store. In the long run, a system should be installed to monitor the level of radiation within the store 24 hours a day so that those who were required to enter the store would have sufficient warning about their extent of exposure to radiation. SP said that the wastes in the air-raid shelter had very low radiation and were stored in new standard stainless steel containers lined with resin. Although the radiation level inside the store was higher than the outside, it was

still too low to have effect on the health of the operators of the store. As regards security control, SP said that since the last time the store was broken in, the Department of Health (DH) had strengthened the security by replacing the original single mild steel shackle and bolt with two separate sets of enlarged welded mild steel shackles each guarded by a stainless steel hasp and locked up with a stainless steel padlock. Additional security installations would be put in place on the advice of the Police to prevent trespassing.

#### Disposal of radioactive wastes

35. Given the lack of a permanent facility for storage of radioactive wastes, Dr LO Wing-lok expressed concern that the Administration would have no choice but to store all the wastes in the air-raid shelter in Wan Chai during the interim. PAS/EFB(B)2 clarified that no additional radioactive waste had been placed in the air-raid shelter since 1990 nor would there be any increase in the amount of wastes to be stored in future. Consequent upon the implementation of the Radiation Ordinance (Cap. 303), there were established guidelines governing the disposal of radioactive wastes. SP added that there were few industries in Hong Kong which generated radioactive wastes. Besides, users of sealed radioactive sources would have to return the sources to the manufacturers concerned when these were no longer in use. As for unsealed radioactive substances used in the medical sector, they were mostly of very short half-lives and would lose their radioactivity within a short time frame, after which they could be disposed of as normal wastes. The average annual volume of radioactive wastes generated in Hong Kong was about 0.26 cubic metres. As to how the 0.26 cubic metres of radioactive wastes were disposed of, SP advised that some of these wastes would be returned to the manufacturers and others being used in medicine, education and research. Licensed users were required to file returns on the details of radioactive substances in their possession. If there were problems in locating the manufacturers, the Administration would try to assist in the disposal of the wastes.

36. Ms Cyd HO enquired about the number of licensed users of radioactive substances. SP advised that the Radiation Board had granted 520 licences for the manufacture, sale, possession or use of radioactive substances or irradiating apparatus. The main users of radioactive substances were hospitals, tertiary institutions and manufacturing companies. As to whether the polluter-pays principle would apply in the disposal of radioactive waste, AD(SHS) said that under the Radiation (Control of Radioactive Substances) Regulation, the proprietor of the undertaking concerned was required to cause all radioactive wastes to be removed from the workplace and to be disposed of in accordance with the provisions of the Regulation.

37. In response to Miss Emily LAU's enquiry about the international practice on the disposal of radioactive wastes and the propriety to export these waste for disposal, PAS/EFB(B)2 said that there was as no international covenant on the disposal of radioactive wastes. The Administration had explored the possibility of sending the wastes to other countries with storage facilities but none of the 22 countries contacted agreed to accept the wastes from Hong Kong. Noting that the Mainland also had storage facilities for radioactive wastes, discussion between the two sides on the technical feasibility of sending the wastes to the Mainland was underway. As the Deputy Chairman of the Guangdong Daya Bay Nuclear Plant Safety Consultative

Committee, Ir Dr Raymond HO said that he was aware that there was sufficient expertise in the Mainland to handle radioactive wastes. He asked whether the Mainland was approached only after the 22 countries had rejected the proposal and whether such a proposal was made before 1997. PAS/EFB(B)2 confirmed that the 22 countries were contacted in 1997 while the Mainland was approached in 1998.

38. Mr Albert CHAN expressed concern that the effects of radiation had often been under-estimated. The radioactive wastes would not have been rejected by all the 22 countries if they were harmless. He stressed that he could not tolerate the storage of these wastes in the centre of the city, and that such wastes should be removed as soon as possible. He cautioned that the Government would be culpable for the serious consequences if the radioactive wastes were later found to have detrimental effects on health.

### Health concerns

39. Ms Cyd HO expressed concern about the impact of radiation on the health of users of radioactive substances. SP responded that the public should not be overly alarmed about the effects of radiation. Those who had to be exposed to radiation in their course of work were required to be equipped with personal radiation monitoring devices to measure the dosage of radiation which they were exposed to. The average annual occupational exposure was about 0.14 millisievert (mSv), which was roughly equivalent to the radiation exposure from the taking of two simple chest X-ray examinations or a few long distance flights. This was not at all significant as compared to an average annual exposure of 2 to 3 mSv to the natural background radiation and the statutory annual occupational exposure limit of 20 mSv. While acknowledging that those who were exposed to radiation in their work were aware of the need for protection, Ms HO pointed out that the general public might not have such an awareness, particularly when they were inadvertently exposed to radiation. She considered it necessary to enhance the transparency in dealing with radioactive wastes. SP said that all licensed users of radioactive substances were required to display their licences, put up warning notices on radiation outside their workplaces and restrict entry by the general public. As to how those working in the same building of licensed users of radioactive wastes would be protected against radiation, AD(SHS) said that guidelines on responsibilities of licensees, requirements for protection of workers and public, storage of radioactive substances and disposal of wastes were given in the conditions of licence. This should provide adequate protection for those working in the vicinity.

40. Miss Emily LAU was not convinced of the Administration's response. She pointed out that the occurrence of blood cancer among students of WYC had aroused public concern over the correlation between the storage of wastes and the disease. The Acting Assistant Director (Special Health Services) (AD(SHS)) said that according to the information provided by the Principal of WYC, there were five students who had cancer. Two of the students contracted the disease before joining WYC while the remaining three had the disease after they joined WYC. In the light of the recent concern, DH had installed additional monitoring devices at WYC to measure the radiation level which was found to be the same as the background radiation level. It was concluded that the radioactive wastes at the store could not

have contributed to an increase in radiation nor to the occurrence of cancer. At a meeting with parents of WYC students in mid February 2001, DH had called on the parents of those students who had contracted the disease to provide more information on the situation of their children. So far, the parents concerned had not been in touch with the Department. Notwithstanding, DH would continue to provide the monitoring results of the radiation level of the surrounding environment to the WYC students and the Wan Chai District Council with a view to allaying the psychological concern. Miss LAU agreed that pending the early removal of wastes, a more scientific analysis should be provided to convince the public that the storage of wastes would pose no adverse impact on public health. Given that the radioactive wastes had been stored since 1965, she said that it might be worthwhile for those who considered their health being affected to approach DH for advice.

41. Mr MAK Kwok-fung remarked that while there might not be adverse effects arising from radiation, the stress imposed on the students and their parents could be detrimental to the psychological well-being to the extent that their health would also be affected. AD(SHS) said that as there might be different causes of cancer, DH was prepared to analyze any information provided by the parents regarding their children's sickness. However, DH had to respect the families' privacy.

#### The way forward

42. Mr Martin LEE said that he was very dissatisfied with the whole situation. He requested that members of the Panel should also be notified of the monitoring results of the radiation level in the vicinity of the store. As the parents of WYC students were very concerned about the effect of radiation arising from the waste stored, efforts should be made to expedite the preparatory arrangements for the removal of wastes vis-à-vis liaising with the relevant authorities on the transfer of wastes to the Mainland and planning for a purpose-built storage facility in Hong Kong.

43. Miss CHOY So-yuk recalled that at the meeting with parents of WYC students in February, SP had given the same assurances about safety from exposure to radiation. However, his views were challenged by an expert in the field of radiology who had made reference to some latest findings on the effects of radiation. She expressed disappointment that SP had been maintaining his stance and misleading the public. She urged for the removal of these potentially dangerous radioactive wastes from their existing storage place in Wan Chai within two and a half years.

44. DSEF referred members to the three letters provided by the radiological experts which set out the effects of radiation, the contents of which were broadly similar to what was stated in the Administration's paper. He recognized that there was a psychological effect on exposure to radiation but the degree of radioactivity at the store was no greater than the background levels. The Administration was prepared to make arrangements for the removal of these wastes but the question was how much the community was prepared to pay. As the tender price for a purpose-built storage facility was much too high, it made sense to look at other alternatives. He undertook to expedite the negotiation with the Mainland authorities for the transfer of wastes and to report to members as soon as a decision was reached. At the Chairman's request, the Administration agreed to provide the Panel with the latest

development on the transfer of radioactive wastes.

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