

Information Note

Panel on Economic Development Radiation monitoring after the Japanese Fukushima nuclear power plant incident

Introduction

The Hong Kong Observatory (HKO) started monitoring radioactivity in the air in 1961. This was enhanced into a comprehensive environmental radiation monitoring programme (ERMP) in 1987 following the decision to build the Daya Bay Nuclear Power Plant. The main components of the ERMP are (i) setting up a network of 10 radiation monitoring stations to monitor the real-time gamma radiation levels in Hong Kong (Figure 1); and (ii) collection of samples of air, food, water, soil, etc., and detection/analysis of radioactivity in these samples in the radiation laboratory (more information on radiation detection/analysis equipment in Annex 1). HKO also sets up a permanent radiation exhibition and provides relevant educational materials for the public to facilitate understanding of the science of radiation.

Enhanced radiation monitoring after the Fukushima nuclear incident

2. Since the ERMP has been formulated to cover all aspects of radiation monitoring in respect of the operation of the Daya Bay Nuclear Power Plant, it is equally effective to monitor the impact of other distant nuclear incident to Hong Kong. Some components of the programme were enhanced in response to the development of the Fukushima incident:
 - a. increasing the frequency of air sampling and radiation measurement;
 - b. carrying out additional aerial radiation monitoring over Hong Kong using a Government Flying Service helicopter;
 - c. collecting and analyzing additional soil and seawater samples;
 - d. reporting measurements of all of the above on the HKO website or through press conferences;
 - e. making available on the HKO website hour-by-hour radiation level data at 10 locations in Hong Kong;
 - f. estimating the trajectory of the air reaching Hong Kong, so as to help identify whether the origin is from Japan; and
 - g. estimating the trajectory of air originating from Japan, so as to help people assess where the released radiation would go.

Manpower deployment

3. HKO has the necessary manpower to carry out radiation monitoring activities according to the Daya Bay Contingency Plan. Following the Fukushima incident, a number of staff with nuclear emergency response duties are deployed to cope with the additional workload.

Public education

4. The HKO radiation exhibition is frequently visited by school children, various organizations as well as members of the public. A virtual tour of the exhibition is also made available on HKO's website, together with a whole spectrum of educational materials on radiation, radiation protection, health effects etc. These webpages have become more popular after the Fukushima incident, with page hits reaching 1.8 millions in the first quarter of 2011, compared with the annual page hit of 1 million in previous years.

5. Several initiatives were launched after the incident:

- a. Production of videos for Upper Albert Road Facebook and HKO@Youtube;
- b. Hosting of press conferences;
- c. HKO professionals appearing as guests in local TV special programmes, as well as RoadShow for local buses;
- d. Organizing public scientific lectures;
- e. HKO Open Days in 26 and 27 March highlighted with exhibits on radiation and nuclear power; and
- f. Enhanced information in HKO webpage.

Hong Kong Observatory
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Figure 1



Location of monitoring stations in the Radiation Monitoring Network

Hong Kong Observatory's Radiation Measurement Facilities

The Hong Kong Observatory monitors the environmental radiation levels in Hong Kong using various advanced equipment to ensure that all possible pathways are adequately covered. The major facilities of the Observatory on radiation measurement are briefly described below.

1. Radiation Monitoring Network

The ambient gamma radiation level in Hong Kong is effectively monitored by ten stations at different places over the territory. The measurement results are transmitted in real-time to the Observatory Headquarters. The instruments are calibrated regularly to ensure the quality of the measurement data.

2. Mobile Radiological Survey Vehicle

The Observatory uses a mobile radiological survey vehicle to measure the radiation levels at different places in Hong Kong. Any environmental sample collected in the survey can be analyzed immediately on the vehicle to confirm the nature and concentration of any detected radioactive substances.

3. Aerial Radiation Monitoring System

The Aerial Radiation Monitoring System is mounted on board a helicopter of the Government Flying Service to measure the radiation levels in the atmosphere or at the ground level in Hong Kong.

4. Radiation Laboratory

There are three major types of instruments in the radiation laboratory to measure respectively the gamma (γ), beta (β) and alpha (α) radiations emitted by different environmental samples and to determine the degree of contamination in the samples.

The instruments in the laboratory are checked and calibrated regularly to

ensure their reliability and accuracy. The quality of the instruments and measurement results is also assured through the laboratory's accreditation for the ISO 9001 from the International Organization for Standardization. Furthermore, in order to ensure that both the measurement methods and results meet international standard, the Observatory has also participated in comparison exercises organized by major organizations including the International Atomic Energy Agency, the National Physical Laboratory of the United Kingdom and the China Institution for Radiation Protection.