

立法會
Legislative Council

LC Paper No. CB(2)649/17-18(05)

Ref : CB2/PL/SE

Panel on Security

**Background brief prepared by the Legislative Council Secretariat
for the meeting on 9 January 2018**

Daya Bay Contingency Plan

Purpose

This paper summarizes past discussions of the Panel on Security ("the Panel") on the contingency plan and related measures of the Administration in the event of nuclear incidents at nuclear power stations near Hong Kong and the Daya Bay Contingency Plan Exercise held in April 2012.

Background

Daya Bay Nuclear Power Station

2. Daya Bay Nuclear Power Station ("DBNPS"), which comprises Guangdong Nuclear Power Station ("GNPS") and Lingao Nuclear Power Station ("LNPS"), is located at Daya Bay about 50 km north-east of the Hong Kong urban area. GNPS and LNPS commenced operation in 1994 and 2002 respectively.

3. GNPS comprises two French-designed pressurized water reactors. Each reactor is protected by three barriers to prevent the release of radioactive material from the core. The design of the pressurized water reactors at LNPS is similar to those at GNPS. The International Atomic Energy Agency ("IAEA"), established under the auspices of the United Nations, conducted safety reviews of GNPS both before and after it commenced operation to confirm that the nuclear station would be operated in strict compliance with international safety standards.

Other nuclear power stations in Guangdong Province

4. In addition to DBNPS, there are other nuclear power facilities being developed in Guangdong Province in recent years, including:

- (a) Yangjiang Nuclear Power Station, which is located approximately 220 km from Hong Kong and part of which has started commercial operation in March 2014;
- (b) Taishan Nuclear Power Station, which is located approximately 130 km from Hong Kong and under construction; and
- (c) Lufeng Nuclear Power Station, which is located approximately 170 km from Hong Kong and initial work of Phase 1 of which is in progress.

International Nuclear Event Scale

5. The International Nuclear Event Scale ("INES") was drawn up by IAEA as an internationally recognized standard for facilitating better understanding by the public, media and the nuclear industry of the degree of significance of nuclear-related events. Under INES, international nuclear events are classified from Level 0 to Level 7. Any event that comes within the classification of INES is considered a Licensing Operational Event. Level 0 is known as "below scale" event, which implies that the event has no safety significance. Levels 1 to 3 events are regarded as "incidents", which have very little or no impact on the environment. Levels 4 to 7 are regarded as "accidents", representing various degrees of radiological impact.

Daya Bay Contingency Plan

6. According to the Administration, it has put in place the Daya Bay Contingency Plan ("DBCP") which sets out appropriate measures to be adopted for public health and safety in case of a release of radioactive materials at GNPS, LNPS as well as other nuclear power stations beyond Daya Bay.

Deliberations of the Panel

Review of DBCP

7. Members noted that the Administration had conducted a review of DBCP after the Fukushima Daiichi nuclear power plant accident in Japan in March 2011. Following the completion of the review in late 2011, members were briefed of the revised DBCP, which contained a series of enhancement

measures covering areas of emergency response structure, radiation monitoring, notification arrangements, accident consequence assessment, boundary control measures on inbound travellers and goods, plume exposure pathway countermeasures, ingestion pathway countermeasures for food and water, enhancement in public information dissemination and public education.

8. Noting that the Japanese authorities had expanded full countermeasures from areas within a zone of 20 km radius around the Fukushima Daiichi nuclear power station to those within a zone of 30 km radius from the nuclear power station, members were concerned whether the Administration would consider adopting similar measures in Hong Kong and enlarging the area from within a zone of 20 km radius to those within a zone of 30 km radius from Daya Bay.

9. Members were advised that a range of 20 km from the nuclear power stations at Daya Bay was to be maintained under the revised DBCP as Emergency Planning Zone ("EPZ") 1, which was in line with the prevailing IAEA standards and the best practices of advanced countries, with possible evacuation, sheltering or the use of thyroid blocking agents as countermeasures. Ping Chau was the only land mass in Hong Kong within EPZ1.

Radiation monitoring system for food and water

10. Members were concerned about the ingestion pathway countermeasures for food and water in case of a nuclear emergency. According to the Administration, a range of 85 km covering the whole territory of Hong Kong was set as EPZ2 with controls over food, live food animals and water imported from areas close to DBNPS, locally produced or supplied. Radiation monitoring would be carried out by the Mainland authorities of food supplied from areas within a 50 km radius of DPNPS to ensure compliance with the standards developed by the Codex Alimentarius Commission. In Hong Kong, radiation monitoring would also be carried out at boundary control points and on the retail level for food, livestock and poultry imported from the Mainland. Regarding food supply, members were advised that while the Mainland was the most important food source for Hong Kong, especially fresh food items, only a small proportion of food imported from places in the vicinity of DBNPS. Members were assured that in the unlikely event of a nuclear incident, there would be sufficient and stable supply of live and fresh food to Hong Kong.

11. Noting that the source of water in Hong Kong mainly came from Dongjiang (ranging from 70% to 80%) and rainwater collected from catchments in Hong Kong (ranging from 20% to 30%), members expressed concern about the supply of water to Hong Kong and the possible contamination of all sources of water in the event of a nuclear accident at DBNPS. According to the Administration, the Water Services Department ("WSD") would monitor the radioactivity of raw water supply from Dongjiang 24 hours a day through an

automated system and collected drinking water samples from different local areas for radiological analysis. In case any contamination was detected, WSD would implement appropriate countermeasures including the rejection of water from contaminated sources, abstracting water from non-contaminated or least contaminated sources first as far as practicable, and adjustment of the water treatment process by increasing the dosage of coagulant and prolonging the sedimentation time to reduce the radioactivity level in the treated water supply to ensure safety.

12. Members were also advised that as the main river course of Dongjiang, from which Dongjiang raw water was supplied, was located more than 50 km to the north of DBNPS, the impact of a nuclear accident at DBNPS on the quality of Dongjiang raw water would be minimal. Furthermore, according to a consultancy study undertaken by the United Kingdom Atomic Energy Authority, the impact of radioactive plume arising from a major release at DBNPS on water in the main reservoirs of Hong Kong, which were located about 30 km from DBNPS, would also be unlikely to have contamination level exceeding the control standards.

Notification of nuclear events at nuclear power stations in Guangdong Province

13. Responding to members' concern about the notification of nuclear events in Guangdong Province, the Administration advised that nuclear power stations concerned were required to report emergencies and nuclear events of INES Level 2 or above to the relevant emergency office and regulatory bodies, including the Prevention and Emergency Administrative Commission Office of Guangdong Province for Nuclear Accident of Civil Nuclear Facility ("GDNECO")¹ and the National Nuclear Safety Administration. GDNECO would then notify the Hong Kong Special Administrative Region Government ("HKSARG") in accordance with the agreed arrangement. In the event of an "Off-site Emergency"², GDNECO would immediately notify HKSARG. GDNECO would also extend such notification mechanism to cover all other nuclear power stations in Guangdong Province. The management companies of DBNPS and other power stations in Guangdong Province had also agreed to notify HKSARG of nuclear incidents below INES Level 2 at the facilities under their management.

¹ GDNECO is now renamed as Nuclear Emergency Committee Office of the Guangdong Province.

² The classification of "emergency situations" follows the four-category system of IAEA for classifying nuclear emergencies according to their impact on safety in ascending order of severity, i.e. Emergency Standby, Plant Emergency, Site Emergency and Off-site Emergency.

Monitoring the radiation level of Hong Kong

14. Members expressed concern about the monitoring of radiation level arising from nuclear events. According to the Administration, the real-time radiation monitoring stations of the Hong Kong Observatory ("HKO") could promptly measure whether there was an increase in the ambient gamma radiation level of Hong Kong and indicate the areas affected. An alarm at the HKO Headquarters would be triggered once a significant increase in the ambient radiation level was detected at any one of the monitoring stations. In case HKO's initial assessment indicated that the increase was not caused by natural events, HKO would notify the Security Bureau and enquire with the relevant Mainland authorities as necessary.

15. Members were further advised that such radiation data were made available to the public at HKO's website. Noting that many Hong Kong residents were working and residing on the Mainland, the Administration advised that information about DBCP had been uploaded onto the relevant website and it would provide assistance to Hong Kong residents who encountered difficulties outside the territory of Hong Kong.

DBCP Exercise

16. Members noted that the last DBCP Exercise, codenamed "CHECKERBOARD", was conducted on two consecutive days in April 2012 to test out the revised DBCP. Over 30 bureaux and departments took part in a series of command post drills and field operation in the two-day event. Some members enquired about whether attack from terrorists had been taken into consideration in working out the revised DBCP in the light of the serious consequence of damage so caused. The Administration advised that large-scale anti-terrorist attack exercises involving the use of bioweapons had been conducted before the 2008 Hong Kong Olympic Equestrian Events and Hong Kong 2009 East Asian Games. The exercise would be conducted again at an appropriate time to ensure the Government's capabilities and preparedness for terrorist attack.

17. Regarding the boundary control monitoring and screening of inbound vehicles and travellers in the event of a nuclear accident at DBNPS, members had sought information about whether there was any collaboration between Hong Kong and the relevant Mainland authorities in this aspect. Members were advised that according to the World Health Organization ("WHO"), the contamination caused by radiation was different from that caused by infectious disease. It was not contagious and would reduce over time. According to the views of nuclear experts, a radiation contaminated person would not constitute any harm to other people. Therefore, it would not be necessary to implement compulsory boundary control measures to test the radiation level of goods and

people unless advised by WHO. However, having regard to the concern about health risk, monitoring centres would be set up to provide quick radiation scanning service in the revised DBCP, if necessary. Specific measures would be introduced if the volume of the flow of people and goods was great. Regarding boundary control, a notification mechanism was in place to maintain the communication with the relevant Mainland authorities. Should there be a nuclear accident, close liaison would be maintained and corresponding arrangements would be made in consideration of the circumstances.

18. Some members considered that close collaboration on immigration control between Hong Kong and the relevant Mainland authorities should be included in future exercises. According to the Administration, it had a long-term plan to conduct a large-scale DBCP exercise involving the participation of the relevant emergency response centre in the Guangdong Province and DBNPS so as to identify areas for improvement. Besides, the Administration had maintained liaison with the National Nuclear Safety Administration and made reference to the information provided by the latter in the Exercise Checkerboard. Improvements would be made to the revised DBCP where necessary.

19. The Administration will report to the Panel on the next DBCP Exercise, codenamed "CHECKERBOARD II", conducted on 20 and 21 December 2017 at its forthcoming meeting on 9 January 2018.

Relevant papers

20. A list of the relevant papers available on the Legislative Council website is in the **Appendix**.

Council Business Division 2
Legislative Council Secretariat
5 January 2018

**Relevant papers on
Daya Bay Contingency Plan**

Committee	Date of meeting	Paper
Legislative Council	27.10.1999	Official Record of Proceedings (Question 12)
	30.6.2010	Official Record of Proceedings (Question 1)
	7.7.2010	Official Record of Proceedings (Question 9)
Panel on Security	16.11.2010 (Item I)	Agenda Minutes
Legislative Council	16.3.2011	Official Record of Proceedings (Urgent Questions 1, 2 and 3)
Panel on Security	19.3.2011 (Item I)	Agenda Minutes
Legislative Council	30.3.2011	Motion on "Concern about the impact of the earthquake in Japan on Hong Kong"
Panel on Security	7.6.2011 (Item V)	Agenda Minutes
	6.12.2011 (Item VI)	Agenda Minutes
	3.4.2012 (Item V)	Agenda Minutes
	4.7.2012 (Item V)	Agenda Minutes
	2.12.2014 (Item V)	Agenda Minutes

Committee	Date of meeting	Paper
Legislative Council	25.5.2016	Official Record of Proceedings (Question 22)

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