

For discussion

Legislative Council Panel on Security
Exercise on the Daya Bay Contingency Plan

Purpose

This paper reports on the results of the 2017 Exercise on the Daya Bay Contingency Plan (DBCP), “CHECKERBOARD II” (“棋盤二”).

General Exercise Arrangement

2. In addition to internal drills conducted by relevant departments from time to time, large-scale interdepartmental exercises on the DBCP are organised every three to five years to test the response capabilities of the Government as well as the effectiveness of the DBCP. The latest of such exercise, “CHECKERBOARD II” was held on 20 – 21 December 2017. A dedicated Exercise Management Team comprising representatives from relevant bureau and departments was formed under the Security Bureau (SB) in May 2017 to oversee the planning and conduct of the Exercise. Institut de Radioprotection et de Sûreté Nucléaire (IRSN), France’s public expert organisation in nuclear and radiological risks and a world’s leading organisation in nuclear emergency response and radiation protection, was engaged as the consultant to the Exercise. Over 1,400 officers from 35 bureaux, departments and other organisations (list at **Annex 1**), as well as some 200 volunteers, participated in the two-day event.

3. As mentioned in LC Paper No. CB(2)515/17-18(01) of December 2017, the objectives of Exercise CHECKERBOARD II are:

- (a) to test and enhance the Government's capabilities in dealing with serious nuclear accidents that may affect Hong Kong;
- (b) to test the effectiveness of the DBCP;
- (c) to strengthen Hong Kong's relevant nuclear emergency measures and implementation capability, making reference to the latest international standards and best practices;
- (d) to demonstrate to, and reassure the public of the Government's efficiency, judgement and professional knowledge in tackling nuclear emergencies; and
- (e) to promote public awareness of nuclear emergency preparedness and response.

Exercise Format and Scenarios

4. "CHECKERBOARD II" comprised command post drills and field deployments by departments. A simulated accident at the Guangdong Daya Bay Nuclear Power Station (GNPS) led to the activation of the DBCP, and in turn response actions from relevant bureaux, departments and public organisations, challenging their judgement, efficiency, coordination and cooperation through this process.

5. Developed by IRSN on the basis of French Pressurised Water Reactors (PWRs) similar to those at GNPS, the main Exercise scenario concerned an accident which led to radiological release. This main theme gave rise to various side scenarios of postulated events and situations as the Exercise progressed, including –

- (a) accident notification and information exchange;
- (b) activation of the Government response mechanism;

- (c) plume countermeasures – evacuation of Ping Chau and Mirs Bay Area;
- (d) emergency radiation monitoring and assessment;
- (e) rumour of radiation hotspot;
- (f) radiation monitoring and assistance rendered to incoming travellers and the general public;
- (g) medical treatment for contaminated persons;
- (h) ingestion countermeasures – monitoring and handling of incoming goods, food and live food animals;
- (i) public concern over food and water supplies, and public health; and
- (j) public concern over personal contamination; etc.

Exercise Events

Command Post Drills

6. During the two-day Exercise, a total of 303 initial exercise messages were simulated and issued to 32 player bureaux and departments to test their response, judgement and coordination. At the start of the Exercise, the simulation of the HKSAR Government being notified of an accident at GNPS triggered a series of actions by relevant bureaux and departments to implement the DBCP and their departmental plans. The Emergency Monitoring and Support Centre (EMSC) of SB was activated and worked in conjunction with 26 other departmental emergency centres (**Annex 2**). Critical information about the accident, including the projected consequences, community sentiments etc., was shared among player bureaux and departments on a common electronic platform to facilitate communication. Technical departments, including

the Hong Kong Observatory (HKO), Department of Health and Electrical and Mechanical Services Department conducted assessment on the accident and its consequences. High-level government emergency response structure, including the Chief Executive Steering Group (membership at **Annex 3**) chaired by the Chief Executive personally, was also activated to direct Hong Kong's response to the simulated accident. In addition, player bureaux and departments were required to handle a large number of simulated enquiries from the public and the media.

Field Deployments

7. Aside from the command post drills which focused on inter-departmental coordination and decision-making capabilities of player bureaux and departments in the implementation of countermeasures as outlined above, "CHECKERBOARD II" also required the mobilisation of frontline departments for the following on-the-ground operations to test their practical competence and efficiency in pursuing the following countermeasures –

- (a) implementation of precautionary evacuation of Ping Chau, including island sweeping, use of on-site public announcement (PA) systems for broadcasting of emergency messages, transportation of evacuees by police launches and radiation checking for evacuees at Mobile Monitoring Centre at Ma Liu Shui Public Pier;
- (b) deployment of helicopters and mobile survey teams to measure the radiation level in the environment;
- (c) investigation of a rumour on radiation hotspot by deploying HKO's Radiological Survey Vehicle to carry out a surveillance check on the environmental radiation levels around the suspected hotspot location, and the Fire Service's Department's Hazmat team to search for and recover the radioactive source;

- (d) setting up monitoring centres at boundary control points and designated public swimming pools to provide radiation monitoring and decontamination services to the public;
- (e) monitoring of imported food and live food animals, inbound travellers, goods and vehicles; and
- (f) activation of emergency radiation monitoring centres at hospitals to provide radiation screening, decontamination and tertiary medical treatment for suspected radiologically contaminated persons.

Exercise Consultancy

8. To enhance the professionalism of the Exercise and to raise the Government's response capabilities to a level on par with the prevailing international standards and best practice, we have engaged IRSN, a world-renowned expert in nuclear and radiological risks, to be the consultant to the Exercise. IRSN worked closely with SB in the following areas:

Scenario Design

9. The main technical scenario used in "CHECKERBOARD II" was tailor-made by IRSN to effectively and extensively test the soundness of countermeasures prescribed by the DBCP as well as player departments' response capabilities. The Institute used its Simulator for Observation of Functioning during Incident and Accident (SOFIA), which has a large database of different French Pressurized Water Reactor (PWR) types (similar to the reactors of GNPS) and emergency preparedness and response (EPR) solutions, to conduct studies on PWRs and simulate an accident that is appropriate to be used in the Exercise. Past meteorological conditions in Hong Kong were selected to be applied to the scenario. IRSN then simulated the environmental consequence of the simulated accident. Those simulations were kept secret from player

bureaux and departments before and during the course of the Exercise to challenge the players' competence.

Training

10. IRSN conducted a series of training sessions for relevant bureaux and departments in October 2017. The training covered the fundamentals of nuclear emergency preparedness and response, basic knowledge on PWRs and typical accidents sequences, international standards relating to nuclear emergency response and public protection, radiation protection and dose assessment, post-accident remedial strategies, environmental measurement strategies and analysis of results, and emergency assessment method, etc. Technical drills for participants were conducted at the end of the training workshop. New assessment method on nuclear reactor accident situations and the prevalent environmental measurement and monitoring strategies were introduced to the technical departments..

Expert Advice

11. During the Exercise's planning stage, frontline departments have benefitted from expert advice and suggestions given by IRSN to improve the effectiveness of their implementation of countermeasures. Such improvements, including measures to further minimise the risk of cross-contamination at the laboratory at the Man Kam To Food Control Office, as well as enhancement of the wet decontamination process to afford greater protection to public health, were subsequently adopted by the departments and effectively applied in the Exercise.

Exercise Evaluation

12. IRSN also assisted the Government in evaluating the performance of player bureaux and departments in the Exercise,

particularly in assessing the capabilities of technical departments in responding efficiently to the simulated accident. The Institute will provide its full comments and observations to the Government in due course.

Initial Observations

13. Upon the completion of “CHECKERBOARD II”, we have invited comments and feedback from players, simulators, umpires and observers for the purpose of evaluating the effectiveness of the Exercise. While this process is still underway, we consider, from the comments received so far, that the Exercise has successfully achieved the following:-

- (a) the objective of testing the Government’s response capabilities and the effectiveness of the DBCP was largely met. Player bureaux and departments have demonstrated their competence and preparedness in responding to a serious nuclear accident in accordance with the DBCP. The command, control, planning, deployment and support organisations at various stages of the Government responses were extensively tested;
- (b) the Exercise has raised public awareness of the DBCP and the Government’s EPR efforts through media coverage, complementing the public education programme developed earlier by SB in association with the City University of Hong Kong. Information on the DBCP was added to the guided tour at the University’s Low Carbon Energy Education Centre (LCEEC) to familiarise student visitors with the relevant contingency measures. To date, some 1,100 students have visited the Centre since September 2017 under the programme;
- (c) the engagement of IRSN as the consultant to the Exercise had further raised the level of professionalism of our established EPR system,

measures, and implementation procedures. Relevant bureaux and departments were given the opportunity to further enhance their response capabilities and make positive adjustments to their implementation procedures, bringing them in line with the prevailing international standard and best practice;

- (d) Improvements were made upon the last Exercise in 2012 to the implementation of different parts of the DBCP, and the results were satisfactory. For example, the Police had replaced broadcast of emergency messages in Ping Chau by helicopters with PA systems in effecting the evacuation.

14. That said, we also noted, and will follow up on, the following suggestions received so far from some observers –

- (a) increasing the frequency of exercises and drills of smaller scales that focus on specific aspects of the DBCP to deepen bureaux and departments' understanding of and familiarity with the operation of the response actions concerned;
- (b) stepping up public education on the DBCP;
- (c) further increasing the efficiency and effectiveness of certain countermeasures, such as radiation monitoring and decontamination of individuals; and
- (d) reviewing the criteria and optimal procedures for measuring contamination from a practical point of view.

Next Step

15. We will examine all comments and feedback received to identify areas that can be further strengthened, and follow up with relevant departments as appropriate. The Daya Bay Contingency Plan

and departmental plans and procedures will also be reviewed, taking reference from the experience of the Exercise, as well as the latest international EPR standards and guidelines to ensure their continued adequacy in protecting the public.

Security Bureau

January 2018

**2017 Exercise on the Daya Bay Contingency Plan
“CHECKERBOARD II”**

Participating Bureaux, Departments and Other Organisations

Government Bureaux and Departments

1. Agricultural, Fisheries and Conservation Department
2. Auxiliary Medical Services
3. Customs and Excise Department
4. Civil Aviation Department
5. Civil Aid Service
6. Civil Service Bureau
7. Department of Health
8. Drainage Services Department
9. Education Bureau
10. Electrical and Mechanical Services Department
11. Environment Bureau
12. Environmental Protection Department
13. Food and Environmental Hygiene Department
14. Food and Health Bureau
15. Fire Services Department
16. Government Flying Service
17. Government Laboratory
18. Government Logistics Department
19. Home Affairs Bureau
20. Home Affairs Department
21. Hong Kong Observatory
22. Hong Kong Post Office
23. Hong Kong Police Force
24. Immigration Department
25. Information Services Department
26. Leisure and Cultural Services Department
27. Marine Department

28. Office of the Communications Authority
29. Security Bureau
30. Social Welfare Department
31. Transport Department
32. Water Services Department

Other Public and Private Organisations

1. CLP Power Hong Kong Ltd
2. Hospital Authority
3. Hong Kong Nuclear Investment Co Ltd

**2017 Exercise on the Daya Bay Contingency Plan
“CHECKERBOARD II”**

Emergency Coordination and Control Centres activated

1. Emergency Monitoring and Support Centre (EMSC)
2. AFCD Departmental Emergency Headquarters (AFCD EDH)
3. AMS Control Room
4. C&E Coordination Centre
5. CAS Central Command Centre (CAS CCC)
6. Department of Health Emergency Control Centre (ECC)
7. Emergency Duty Room of Radiation Health Unit, DH
8. DSD Emergency Control Centre
9. First contact point of EDB
10. EMSD Coordination Office (EMSDCO)
11. FEHD Command Centre
12. FSD Director’s Command Post (DCP)
13. Fire Services Communications Centre (FSCC)
14. GFS Air Control and Command Centre
15. GLD Transport Pool Control Centre
16. Government Logistics Centre, GLD
17. HA Head Office Major Incident Control Centre (HOMICC)
18. HAD Emergency Coordination Centre
19. HAD District Emergency Coordination Centre (Tai Po)
20. Hong Kong Observatory Monitoring and Assessment Centre (HKOMAC)
21. Police Headquarters Command and Control Centre (HQCCC)
22. Immigration Department Emergency Coordination Centre
23. Combined Information Centre (CIC)
24. LCSD Departmental Coordination Centre
25. Hong Kong Maritime Rescue Coordination Centre (HKMRCC)
26. TD Emergency Transport Coordination Centre (ETCC)
27. WSD Central Incident Centre

**2017 Exercise on the Daya Bay Contingency Plan
“CHECKERBOARD II”**

**Chief Executive Steering Group
Membership List**

1. Chief Executive (Chairman)
2. Chief Secretary for Administration
3. Secretary for Security
4. Secretary for the Environment
5. Secretary for Food and Health
6. Secretary for Home Affairs
7. Commissioner of Police
8. Director of Fire Services
9. Director of the Hong Kong Observatory
10. Director of Health
11. Director of Electrical & Mechanical Services
12. Director of Information Services
13. Assistant Secretary (Security) 2, Security Bureau (Secretary)