**For discussion**
**on 7 June 2011**

**Legislative Council Panel on Security**
**Notification Mechanism of the Daya Bay Nuclear Power Station**

## Purpose

This paper seeks to brief Members on the progress of the review on notification mechanism for non-emergency licensing operational events (hereinafter called "non-emergency events") at the Daya Bay Nuclear Power Station (DBNPS), the follow-up measures relating to the Fukushima nuclear incident, as well as the arrangements for conducting a comprehensive review of the Daya Bay Contingency Plan (DBCP) and planning a large-scale exercise.

## Progress of the review of notification mechanism

2. To further enhance the transparency of the operation of the nuclear power station, the HKSAR Government has reached a consensus early this year with the Hong Kong Nuclear Investment Company Limited (HKNIC) and the Mainland shareholder of the power station, i.e. the China Guangdong Nuclear Power Holding Company Limited (CGNPC) on **non-emergency events** at DBNPS (i.e. including Level 0 and Level 1 events as well as events of Level 2 or above but not involving emergency response). Under the new arrangement, the Daya Bay Nuclear Power Operations and Management Company Limited would notify the HKNIC within two working days of any non-emergency event at the DBNPS once it is discovered and confirmed. Apart from notifying the Security Bureau (SB) and the Environment Bureau immediately, the HKNIC will, in parallel, disclose the information to the public through its website by giving a brief description of the event, the initial classification of the event and the initial assessment on its impact on environment and public safety. After confirming the information upon thorough investigations, the HKNIC will disclose supplementary information, including the process of the event, actual impact and follow-up actions, etc. through its website as soon as possible.

3. At the special meeting of the Security Panel on 17 January, the HKSAR Government briefed Members on the newly agreed notification arrangement for non-emergency events, i.e. even for non-emergency events, the HKNIC would disclose to the public within two working days and further disclose supplementary information after thorough investigations. The new notification arrangement has been a great improvement to the past practice where the HKNIC will only disclose the number of events with a brief summary every month on its website. At the panel meeting, some Members suggested that the HKSAR Government should consider further reducing the time limit to "within 48 hours" to minimise any possible delay resulting from non-working days. There were also requests for extending the new arrangement to the Lingao Nuclear Power Station (LNPS). In addition, some Members suggested that the information about non-emergency events to be disclosed

should be simple and easy-to-understand to facilitate public understanding of the situation.

4. We agree that in future, the information to be disclosed should be set out in a simple and easy-to-understand manner. With a view to enhancing transparency in the operations of the DBNPS and public confidence in nuclear safety, the HKSAR Government has been discussing the enhancement proposals put forward by Members with the CGNPC, which is now actively examining the feasibility. As regards LNPS, although it is not yet covered by the newly agreed notification arrangement, the HKSAR Government would continue to urge the CGNPC to adopt at LNPS the same notification arrangement used by DBNPS.

**Follow-up measures**

5. The serious nuclear incident at the Fukushima Nuclear Power Plant in Japan this March caused by two consecutive massive natural disasters has sparked grave concern worldwide on nuclear safety. In view of this, the Mainland has taken the initiative to undertake a series of measures to review and reinforce the safety of the nuclear power stations in the country. The HKSAR Government has also conveyed Hong Kong people's deep concern about nuclear safety to relevant Mainland organisations on many occasions. The immediate cause of the Fukushima nuclear incident was the malfunctioning of the reactor cores of the nuclear reactors after being hit by earthquake and tsunami. In this connection, the HKSAR Government has immediately requested the HKNIC to review the situation in DBNPS to ensure its safe operation.

6. After the Fukushima incident, the DBNPS has promptly conducted safety checks and tests on the safety parameters so as to ensure the normal operation of the power plant. Such tests include testing the security of power supply for supporting the normal operation of the cooling system and the overall performance of the safety system to ensure that backup facilities, such as the backup diesel generators, auxiliary feed-water pumps, etc. can function properly to take away the residual heat in the reactor in the event of emergency.

7. In fact, in terms of safety design, the DBNPS adopts the pressurised water reactor design, as against the boiling water reactor design adopted the Japanese Fukushima nuclear power plant. One major difference between the two is that the reactor cooling water of Daya Bay is separated into two independent circuits, namely the primary and secondary circuits. The steam generated in the secondary circuit is non-radioactive. Hence, even if steam is vented, it will not result in any radiation discharge. For the Fukushima nuclear power plant, cooling water is not separated into two independent circuits.

8. Besides, when deciding on the site selection of DBNPS, consideration had already been given to factors of disasters such as seismic activities. The site was finally chosen after approval by the National Nuclear Safety Administration and in strict adherence to international practices. The earth crust around the site is safe

and stable, and the chance of having a massive earthquake is very low. As for the design to protect the DBNPS against earthquake impact, its building, structure, system and facilities are specially designed to withstand an earthquake impact at the Modified Mercalli Scale (MMS) Level VIII. The nuclear power plant units will stop operation promptly and safely when the earthquake intensity has reached a pre-set level. With regard to flood prevention measures, the offshore islands at Daya Bay will provide a natural barrier for the power plant. Besides, a breakwater of about 17 metres above sea level is constructed off Daya Bay and the plants (including standby facilities) are also situated on the land at an elevation of some 6.5 metres above sea level. The design of the DBNPS meets the topographical conditions of the area.

9. In the light of the major nuclear incident in Fukushima of Japan, the public has shown deep concern over our contingency preparedness in the event of a nuclear incident in the vicinity of Hong Kong. In view of this, the Government will conduct a comprehensive review of the DBCP to ensure that the plan can progress with time and continue to effectively cope with any possible emergencies.

**Progress of the DBCP review and exercise**

10. The DBCP had been prepared in accordance with international standards and a Consultancy Report of the United Kingdom Atomic Energy Authority, and was implemented after being tested. In the event of a nuclear incident, the DBCP will be activated to minimise the impact to Hong Kong. Apart from the internal and inter-departmental exercises and drills frequently conducted by various departments, the SB also coordinates from time to time large scale comprehensive inter-departmental exercises to test the coordination among departments and the overall feasibility of the DBCP. The contents of the contingency plan have been improved in the light of the outcomes of and experiences gained in the exercises.

11. For the purpose of conducting a comprehensive review on the DBCP, the SB has set up a special task force which will play a leading and coordinating role in the review and the exercise. We will revise the contingency plan with reference to the suggestions to be made by the International Atomic Energy Agency (IAEA)[1] and other international organisations on the Fukushima nuclear incident, and having regard to the actual situation in Hong Kong. We expect that the IAEA and other international organisations will publish a report on the Fukushima incident and make suggestions by the middle of this year, from which we may draw reference with a view to completing the review within this year. A large-scale and comprehensive inter-departmental exercise will be conducted early next year in the light of the revised contingency plan to test the preparedness and response capability of various departments.

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[1] The Ministerial Conference on Nuclear Safety to be held by the IAEA from 20 to 24 June 2011 in Vienna, Austria will presumably come up with reports and insights concerning the causes and consequences of the Fukushima incident in Japan and the development and future direction of international nuclear safety. The objectives of the Conference include making a preliminary assessment of the Fukushima nuclear incident, identifying areas of the global nuclear safety framework which may need to be reviewed, and identifying possible future actions.

12. The review of the DBCP will cover various aspects, including its application, the latest international nuclear safety standards and contingency measures, the notification mechanism for nuclear incidents, radiation monitoring and assessment in Hong Kong, contingency preparations and measures, and actions to be taken upon activation of the contingency plan, etc. Please refer to the **Annex** for details. We will also request the various departments concerned to review and update their own departmental plans.

13. The Government will make public the DBCP after revision. Apart from the large-scale exercise mentioned in paragraph 11 above, we will also promote and enhance public education on radiation safety. We will, through various channels, enhance public understanding on nuclear and radiation safety so that the general public will be aware of the various protective measures to be taken in case of nuclear incidents at different levels.

14. As for the large-scale exercise planned for 2012, we propose that it be conducted in the first quarter of the year, subject to the progress of the report and suggestions as mentioned in paragraph 11 above. Upon completing the revision of the DBCP, we will finalise the exercise plan. In the interim, we will consult experts on nuclear safety, draw on the experiences of the Fukushima nuclear incident as well as the contingency work overseas, and have regard to Hong Kong's special circumstances. We will carefully prepare the data to be used in the exercise (including radiological, meteorological and other data) to ensure that the simulated emergency situations are realistic and that the preparedness and response capability of various departments can be fully tested.

15. Departments involved in the DBCP will play various roles in the exercise, such as sending out officers to act as players, assessors, simulators, observers etc. We will invite outside parties (e.g. HKNIC, nuclear plant operators, the Guangdong authorities etc) as necessary in playing various roles. We also plan to involve public participation in certain parts of the exercise.

16. We will invite experts locally as well as those from the Mainland, overseas and international organisations to observe the exercise and provide feedback. We will then assess the outcome of the exercise, review the DBCP as necessary and set out the direction for carrying out future exercises.

Security Bureau
May 2011

**Annex**

## Areas to be covered in the Review on the Daya Bay Contingency Plan

(I) Review the application of the Daya Bay Contingency Plan (DBCP)

- Assess the nuclear risks facing Hong Kong, including the impact on Hong Kong in case of an incident at a nuclear plant in the vicinity of Hong Kong.

(II) Strengthen the notification mechanism for nuclear incidents

- Discuss with the Mainland authorities and all parties concerned on the ways to further enhance the existing notification mechanism for nuclear incidents, including the coverage of the mechanism and sharing of information.

(III) Step up radiation monitoring and assessment in Hong Kong

- Review the environmental radiation and water contamination monitoring systems, expand the radiation monitoring network and enhance the assessment capability of nuclear accident consequences, in particular in safeguarding public safety and health;
- Release in a timely manner data of the ambient radiation level and water quality to maintain a high degree of transparency.

(IV) Follow closely the latest nuclear safety standards and contingency measures

- Pay close attention to the latest development of international nuclear safety and information on the relevant standards, such as the views and suggestions of the International Atomic Energy Agency (IAEA), World Health Organisation and other international organisations and experts; and draw on the lessons learned from the Fukushima incident in Japan;
- Examine the nuclear emergency contingency work abroad and draw reference from their experiences;
- Consult the Radiological Protection Advisory Group and local nuclear experts to update technical information and safety standards on radioactivity in the DBCP.

(V) Step up measures and work subsequent to activation of contingency plan

- Review the HKSAR Government emergency structure to be adopted in the event of a nuclear incident;
- Enhance the arrangements for release of information to the public;
- Assess the plume countermeasures, including the arrangements for

evacuation, sheltering and taking iodine tablets;

- Assess the boundary control measures, including the arrangements for radiation monitoring of persons and cargo;
- Assess the ingestion countermeasures, including the arrangements for radiation monitoring of food, livestock and water;
- Assess the arrangements for opening the monitoring centres and decontamination centres to ensure capability of providing assistance to persons suspected to be radiologically contaminated;
- Assess the arrangements for the disposal of radiologically contaminated waste;
- Assess the need of and arrangements for enacting emergency legislation in case of a nuclear emergency;
- Assess the manpower, resources, equipment and training involved in the contingency plan and update the arrangements;
- Review the work of various government departments upon the activation of the DBCP;
- Step up cross boundary and external liaison.