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Panel on Security

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for the meeting on 7 June 2011**

Daya Bay Nuclear Power Station Notification Mechanism

Purpose

This paper summarizes relevant discussions of the Panel on Security ("the Panel") on the notification mechanism and contingency plan of the Hong Kong Special Administrative Region ("HKSAR") in the event of a nuclear incident at Daya Bay Nuclear Power Station ("DBNPS").

Background

Daya Bay Nuclear Power Station

2. 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 city centre. GNPS is owned by the Guangdong Nuclear Power Joint Venture Company Limited ("GNPJVC"), with a 75/25 joint venture between the Guangdong Nuclear Investment Company Limited ("GNIC") and the Hong Kong Nuclear Investment Company Limited ("HKNIC"). HKNIC is a wholly owned subsidiary of China Light & Power Holdings Limited ("CLP"). CLP is also a shareholder of the Daya Bay Nuclear Power Operations and Management Co Ltd ("DNMC") which is responsible for the management and operation of GNPS. GNIC, as the majority shareholder of DNMC, oversees its daily operation. About 70% of GNPS's electricity output is supplied to Hong Kong. The output of LNPS is entirely supplied to Guangdong Province. GNPS and LNPS commenced operation in 1994 and 2000 respectively.

3. According to the Administration, 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. In addition, there are multiple protective systems. In the event of failure of one of the systems, there are multiple means for meeting the safety targets. 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 on GNPS both before and after it commenced operation to confirm that the nuclear station would be operated in strict compliance with international safety standards. The United Kingdom Atomic Energy Authority also conducted a comprehensive risk assessment on GNPS and concluded that the risk to Hong Kong residents was extremely low and much smaller than the risks encountered in everyday life.

International Nuclear Event Scale

4. 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 ("LOE"). 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 to the environment. Levels 4 to 7 are regarded as "accidents", representing various degrees of radiological impact. All incidents and accidents have to be verified, reported, analyzed and rectified so as to prevent any recurrence in the future. Events falling outside the classification of INES (i.e. "out of scale" or below Level 0) are matters which do not have any relevance to safety. The INES classification takes into account many factors, including any degradation of safety protection measures, integrity of radiological barriers and control devices, as well as impact on the public and the environment.

5. According to the Administration, DBNPS adopts the INES rating system. In case of a LOE, DBNPS shall, in accordance with Mainland statutory requirements, report the event to the relevant state regulatory body, namely the National Nuclear Safety Administration ("NNSA"). NNSA will handle the matter accordingly, including examining and confirming the contents of the report and the rating of the event. NNSA has a number of inspectors stationed on-site at DBNPS to monitor the station's operation and performance.

Notification mechanism

Notification mechanism between the Government of the Hong Kong Special Administrative Region and the Guangdong authorities

6. The HKSAR Government and the Guangdong authorities have established an official contingency notification channel. In brief, the Prevention and Emergency Administrative Commission Office of Guangdong Province for Nuclear Accident of Civil Nuclear Facility ("PEACO/GD") is responsible for coordinating contingency actions to be taken by various Guangdong authorities in response to events at DBNPS. In case of a contingency event or accident at the station, the DBNPS operator will inform PEACO/GD and other relevant state organizations immediately. PEACO/GD will notify the Hong Kong authorities of the classification of the "emergency situation" in accordance with the arrangements agreed between the two sides. The classification of "emergency situation" follows IAEA's four-category system for classifying nuclear emergencies according to its impact on safety in ascending order of severity -

Classification of emergency situation	Description
Emergency Standby	Safety levels may be reduced at the plant.
Plant Emergency	Radiological consequences of the emergency are confined to a section of the plant.
Site Emergency	Radiological consequences of the emergency are confined to the site.
Off-Site Emergency	Radiological consequences of the emergency extend beyond the site boundary.

7. In the event of an "Off-Site Emergency", PEACO/GD will immediately inform the HKSAR Government via the Hong Kong Observatory ("HKO"). HKO will acknowledge receipt, inform the Security Bureau ("SB") and commence the assessment process. SB will determine the appropriate level of activation of the Daya Bay Contingency Plan, which had been drawn up in consultation with IAEA to deal with nuclear accidents and had been tested by IAEA before promulgation. It will also direct and coordinate the HKSAR Government's response to the nuclear incident. PEACO/GD will provide updated report on the situation no longer than every six hours. It will give further notification immediately on detecting significant changes. In times of non off-site emergencies, PEACO/GD is also obliged to notify Hong Kong. Depending on the situation, SB will determine the appropriate level of

activation of the Daya Bay Contingency Plan. After receiving a report of "Site Emergency" from DBNPS, PEACO/GD will make a first notification to the Hong Kong authorities as soon as possible based on the circumstances at that time or at the latest two hours after being notified by DBNPS. Thereafter, PEACO/GD will make follow-up notifications once every six hours. If there are significant changes, the follow-up notifications will be made as soon as possible. When a nuclear incident leading to a "Plant Emergency" or an "Emergency Standby" occurs at DBNPS, PEACO/GD will notify the Hong Kong authorities at the same time when it notifies IAEA.

8. Pursuant to the United Nations Convention on Early Notification of a Nuclear Accident, the People's Republic of China ("PRC") is obliged to notify IAEA of any accident at a nuclear facility within PRC leading to a release or likely release of radioactive material. IAEA, after receiving such a notification, will inform HKO. The Hong Kong authorities will follow up on the report with the Guangdong authorities through the established liaison channel. This arrangement is an additional notification channel to that established with PEACO/GD.

Notification system between the Administration and China Light & Power Holdings Limited/Hong Kong Nuclear Investment Company Limited

9. HKNIC submits monthly reports of LOEs to its board of directors, members of which include representatives from SB and the Environment Bureau ("ENB"). Upon receipt of any such reports, SB will request relevant government departments, including HKO, the Electrical and Mechanical Services Department ("EMSD") and the Department of Health, to study the reports and make an assessment. Should there be any questions concerning nuclear safety, the Administration will seek clarification from HKNIC immediately. HKNIC also uploads onto its website the monthly number of LOE events at DBNPS with a brief description of the events for reference of the general public.

10. Under the Electricity Ordinance (Cap. 406), CLP is obliged to notify the Director of Electrical and Mechanical Services of a loss or impending loss of all or a portion of the electricity supply from a power source outside Hong Kong. An unscheduled power interruption from GNPS may indicate an abnormality at the power station, though this does not necessarily entail the occurrence of a nuclear event. Apart from being notified by DBNPS, the CLP System Control Centre will also detect power interruption through its own monitoring system. The Control Centre will alert EMSD and HKO in accordance with the established notification mechanism. The first notice will generally reach the Government within 15 minutes of the power interruption, and the information received will then be assessed and analyzed.

Events which occurred at GNPS on 23 May and 23 October 2010

11. Arising from an event which occurred at GNPS on 23 May 2010 ("the May event") and another event which occurred at GNPS on 23 October 2010 ("the October event"), the Panel discussed the Daya Bay Nuclear Power Station Notification Mechanism at its meetings on 6 July and 16 November 2010.

Need for an overall review of the notification mechanism

12. Members generally considered that the Administration was too passive in discharging its monitoring role despite the presence of established mechanisms for the relevant parties to notify the Administration of nuclear emergencies at power stations in Daya Bay. Members called on the Administration to conduct an overall review of the notification mechanisms with PEACO/GD, CLP and HKNIC as well as the Daya Bay Contingency Plan, with a view to enhancing the transparency of nuclear power stations' operation and performance, identifying areas for further improvement to the current mechanisms for monitoring nuclear and radiation-related events, and facilitating the Administration in making coordinated and proactive response to nuclear incidents.

13. The Administration advised that it noted that the May and October events had aroused wide concern in the community over nuclear safety. It acknowledged the need to meet the increasing expectation for greater transparency, responsiveness and coordination among the relevant stakeholders in case of any event which might affect the normal operation of the power stations in Daya Bay. The Administration was reviewing the arrangement for handling nuclear events and the notification mechanism, with a view to enhancing transparency and strengthening coordination with all concerned parties. The Administration had requested CLP to disseminate information relating to nuclear incidents in DBNPS in a timely manner.

Notification mechanism and information disclosure policy for matters outside the INES classification

14. Members considered it necessary for DNMC to review and fine-tune the information disclosure policy for matters outside the INES classification. They considered that the HKSAR Government should be notified immediately of all nuclear incidents, including those classified under INES as Level 0 or Level 1 events.

15. CLP advised that it was aware of the concern of the community about the safety of the power stations in Daya Bay. For events falling outside the INES classification or matters which did not have any relevance to safety, CLP would focus on finding out what and how to communicate consistently to the public under such circumstances. HKNIC would examine how its mechanism for disclosure of nuclear incidents could be improved in respect of transparency and timing as well as method of communication.

16. Concern had been raised as to whether the request for immediate notification of all nuclear incidents was not addressed because HKNIC only had a 25% share in GNPJVC. CLP advised that there was no question of the request not being addressed because of HKNIC's percentage of share in GNPJVC.

Appointing government officials to the Daya Bay Nuclear Safety Consultative Committee ("NSCC")

17. Members called on the Administration to request the relevant authorities of the Mainland to notify the HKSAR Government of any operational events occurring in the power stations regardless of their severity. Additionally, the Administration should explore with DNMC the possibility of appointing government officials to NSCC, so as to increase the participation of the HKSAR Government in the monitoring of the safety situation of the two power stations in Daya Bay. There was a view that the Administration should consider appointing observers to monitor the operational activities and production processes of DBNPS.

18. The Administration advised that the current notification mechanism comprised two channels. On one hand, DNMC, the operator of the two power stations, would notify HKNIC of any LOE, submit monthly reports of LOEs to its Board members and upload such information onto its website for public reference. On the other hand, the HKSAR Government and the Guangdong authorities had established an official notification channel.

19. According to the Administration, NSCC was formed some 20 years ago by DNMC in the Mainland with membership invited by DNMC. While the HKSAR Government was not represented in NSCC, the suggestion of appointing representatives of the HKSAR Government to NSCC had been conveyed through CLP to DNMC. Members noted that the roles of NSCC included discussing the reports on the planning and implementation of nuclear safety on operational and construction matters of the nuclear power stations under the operation and management of DNMC, and providing opinions and suggestions on nuclear safety based on national nuclear safety regulations, with reference to the nuclear safety information of international nuclear safety organizations and nuclear safety situations.

Inclusion of additional provisions in the Scheme of Control Agreement

20. Noting the difficulties in monitoring the operation of GNPS given the fact that it was owned by GNPJVC with a 75/25 joint venture between GNIC and HKNIC, some members called on the Administration to include additional provisions in the Scheme of Control Agreement ("SCA") entered with CLP to the effect that it was a mandatory requirement for CLP to notify the Administration of all operational events occurring in the nuclear power station.

21. The Administration advised that GNPS was regulated by the Mainland statutory requirements promulgated by NNSA. As such, the Administration did not consider it appropriate to monitor GNPS's operation through SCA.

Review of the notification mechanism and enhancement measures

22. The Panel followed up the progress of review on notification mechanism of DBNPS at its meeting on 17 January 2011. Members were informed that to enhance the transparency of the operation of DBNPS, the Administration had discussed with HKNIC and the Mainland shareholder of the power station enhancements to the information disclosure mechanism. All parties agreed that building on the foundation of the established information disclosure mechanism for emergency events, the disclosure arrangement could be further enhanced particularly for events not involving emergency response, including those classified at Level 0 and Level 1 as well as events at Level 2 or above but not involving emergency response ("non-emergency events").

New arrangement for disclosure of non-emergency events at DBNPS

23. Noting that under a new arrangement, DNMC, which was responsible for the management and operation of DBNPS, would notify HKNIC within two working days of any non-emergency LOE at DBNPS once it was discovered and confirmed, members were concerned whether there was room for expediting the information disclosure process so as to avoid any unnecessary speculation in the community. There was a suggestion that a time limit shorter than two working days for confirming and disclosing information on non-emergency LOEs should be adopted.

24. According to CLP, the disclosure of information could be made well within the two working-day limit in most cases. However, there might be cases where the gathering and preparation of information for release to the public might need more time than usual due to the complicated nature of these cases. The premature release of information without any contexts might create

undue concern in the society. HKNIC fully recognized public concern over nuclear safety. Even though a non-emergency LOE would not affect the safe operation of the nuclear power station and had no impact on the external environment and public safety, HKNIC would render full effort to release information in a timely and proactive manner. The new arrangement was introduced with the ultimate purpose of strengthening HKNIC's communication with the public and enhancing public understanding of safety and operation at the nuclear power station.

25. Another concern raised by members was that despite the enhancement to the information disclosure mechanism, the lead time required for verifying, confirming and disclosing to the public information on a non-emergency LOE which occurred at DBNPS might still be too long, in particular when the actual time of public disclosure was days after the occurrence of the LOE due to intervening holidays. Concerns had been raised over the possibility of the five-day week work pattern in the Mainland delaying the assessment and information disclosure processes, particularly when there were long public holidays, such as Lunar New Year Holidays and National Day Holidays.

26. Noting that a number of sites in the Guangdong Province had been identified for developing nuclear power stations, some members were concerned about the potential risk to Hong Kong residents and the environment. They sought information on whether the Mainland authorities had conducted comprehensive risk assessments for each of the projects.

27. According to the Administration -

- (a) there had been an international practice and a practice adopted by the Mainland to develop contingency plan on nuclear incidents based on the distance from nuclear power stations. According to practices commonly adopted internationally, in case of nuclear incidents, full countermeasures had to be considered for an area within 10 km to 16 km from the nuclear power station, to prevent direct exposure to radiation or inhalation of airborne radioactivity. Ingestion pathway countermeasures had to be considered for an area within 50 km to 80 km from the nuclear power station, to prevent the intake of contaminated food, water or milk by the public;
- (b) among the existing and planned nuclear power stations in the Guangdong Province, DBNPS was the closest to Hong Kong. It was about 20 km away from the nearest landmass of Hong Kong and 50 km away from the city centre. Since the operation of DBNPS, the governments of HKSAR and Guangdong had

established contingency and notification mechanisms on emergency arrangements for the nuclear power station. Cooperation agreement and information exchange on emergency response had also been worked out. The cooperation, emergency response and notification arrangements were set out in the Daya Bay Contingency Plan; and

- (c) other nuclear power stations under construction or planning were over 130 km away from Hong Kong.

Coverage of the new notification arrangements

28. Noting that both GNPS and LNPS were located at the Daya Bay site, members were concerned whether the new notification arrangements would apply to both stations.

29. According to the Administration, the HKSAR Government had held in-depth discussions over the past few months with HKNIC and the Mainland shareholder of DBNPS, namely the China Guangdong Nuclear Power Holding Company Limited, on the enhancement to the notification mechanism. It was agreed that the new notification arrangements should apply to GNPS at the initial stage. The HKSAR Government would continue its discussion with the relevant parties, with a view to extending the application of the new arrangements to LNPS.

Disclosure of supplementary information

30. Members sought information on whether HKNIC would, besides releasing information through its website, issue press releases and hold press briefings to inform the public of the occurrence of non-emergency LOEs at DBNPS.

31. HKNIC advised that in accordance with Mainland regulations, DNMC should submit a written report to NNSA within 30 days after obtaining the detailed facts upon completion of a thorough investigation into a LOE. After DNMC had submitted the report to NNSA, HKNIC would, where necessary, arrange to disclose through its website further details of the investigation, including the process of the LOE, the actual impact of the LOE and the follow-up actions taken. For a LOE which occurred at DBNPS, HKNIC would make use of necessary channels, including press releases or briefings, to keep members of the public abreast of the development of the relevant LOE.

Comprehensive tests on the Daya Bay Contingency Plan

32. When the contingency measures and Outbound Travel Alert in relation to the nuclear plant incident in the Fukushima Prefecture of Japan was discussed at the Panel meeting on 19 March 2011, members noted that comprehensive tests on the Daya Bay Contingency Plan were conducted in November 1990, May 1993, December 1996 and February 2001 under the observation of IAEA or other international experts. Members were concerned that comprehensive tests on the Daya Bay Contingency Plan had not been conducted since February 2001 and the next comprehensive test was scheduled to be held on 2012. Members considered that the comprehensive test should be advanced to 2011.

33. The Administration advised that large-scale exercises involving public participation were conducted before the 2008 Olympic Equestrian Events and 2009 East Asian Games. Different kinds of inter-departmental exercises were also conducted from time to time. Before conducting the next comprehensive test, the Administration would consider whether the Daya Bay Contingency Plan should be revised, having regard to the experience of Japan in handling the nuclear plant incident in Fukushima Prefecture.

Relevant papers

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

**Relevant papers on
Daya Bay Nuclear Power Station Notification Mechanism**

Committee	Date of meeting	Paper
Legislative Council	27.10.1999	Official Record of Proceedings (Question 12)
Legislative Council	30.6.2010	Official Record of Proceedings (Question 1)
Panel on Security	6.7.2010 (Item IV)	Agenda Minutes
Legislative Council	7.7.2010	Official Record of Proceedings (Question 9)
Panel on Security	16.11.2010 (Item I)	Agenda Minutes
Panel on Security	17.1.2011 (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"