For discussion
on 25 October 1999

Legislative Council Panel on Economic Services

# YEAR 2000 READINESS IN GOVERNMENT DEPARTMENTS AND ORGANISATIONS UNDER THE PURVIEW OF THE ECONOMIC SERVICES BUREAU

## PURPOSE

The purpose of this paper is to update Members on the progress of Y2K readiness in Government Departments and the Hong Kong Tourist Association under the purview of the Economic Services Bureau (ESB).

2. This paper covers the progress of the following Government departments and the Hong Kong Tourist Association:

(a) Civil Aviation Department (civil aviation management) (CAD)

(b) Marine Department (port management) (MD)

(c) Electrical and Mechanical Services Department (energy supply, electrical and gas safety) (EMSD)

(d) Hong Kong Observatory (meteorological service) (HKO)

(e) Agriculture and Fisheries Department (food supply) (AFD)

(f) Hongkong Post (postal service) (HKP)

(g) Hong Kong Tourist Association (promotion of inbound tourism) (HKTA)

3. It also covers the progress of the container terminals and the energy supply sector comprising the electricity, gas and oil suppliers. Progress of Y2K readiness of the Airport Authority is the subject of a separate paper.

**OVERVIEW ON PREPARATIONS FOR Y2K**

4. Overall, substantial progress has been made for all the organisations listed in paragraph 2 since we last reported progress to the Panel. All of their mission-critical systems have been confirmed to be Y2K compliant. Contingency plans have been formulated and tested to deal with disruptions that may arise from Y2K failures. Progress has been regularly reported to the Information, Technology and Broadcasting Bureau. Efforts have been made to publicise progress on preparations for Y2K.

5. In order to provide a quick and coordinated response to Y2K disruptions on sector-wide level, sector-wide contingency plans have been formulated and tested for port management, energy supply, supply of fresh food produce and civil aviation. These plans are respectively coordinated by MD, EMSD, AFD, CAD and the Airport Authority.

**DETAILED PROGRESS REPORTS**

6. The following is a summary of the progress of preparations for Y2K readiness by individual Government departments, the Hong Kong Tourist Association, the container terminal operators and companies supplying electricity, gas and oil.

***Civil Aviation Department (civil aviation management)***

7. All the 104 mission-critical systems in the Civil Aviation Department (CAD) have been tested and verified to be Y2K compliant as from end June 1999. The Department recognises the importance of the quality assurance of its Y2K compliance work. In this regard:

(a) CAD considers that the framework for managing its Y2K testing programme was adequate as all tests were carried out jointly by the system user, the CAD Engineering Section and the air traffic control (ATC) system maintenance contractor. There was adequate quality control particularly with respect to the test plans and results

which were vetted regularly by a review group led by a senior officer;

(b) On air traffic management, the importance of quality assurance was addressed among aviation authorities through regular regional Y2K Contingency Planning Task Force Meetings organised by the International Civil Aviation Organisation (ICAO). Furthermore, in November 1998, the Y2K Project team of the International Air Transport Association (IATA) visited CAD to review the Y2K readiness of CAD's ATC services. The IATA expressed satisfaction with the CAD's organisation and execution of Y2K work. CAD had adopted sound Y2K rectification approach and methodology and strong testing method.

(c) The Information Technology Services Department (ITSD) inspected CAD's Y2K test programme and methodology in April/May 1999. Its assessment was that the CAD Y2K rectification work had progressed well and that CAD handled the Y2K programme seriously and recorded the work with full details.

8. CAD has put in place contingency plans and backup measures which are based on the framework recommended by the ICAO for the Asia/Pacific region. These have been promulgated to the airlines and aviation authorities. They include contingency air routes and ATC coordination procedures. Existing communications arrangements with the neighbouring ATC authorities have also been tested. Tests and drills on these plans and measures have been ongoing since August 1999. In addition, extra facilities/equipment such as alternative communications systems including satellite phones, personal computer-based message switching system and standalone backup radar display will be put in place by mid-November this year.

9. Although each organisation is responsible for the Y2K compliance of its own systems, the CAD Y2K Compliance Task Force continues to keep track of the Y2K compliance status of the safety and

security related systems of Hong Kong's key aviation related organisations, including the Airport Authority (AA), Hong Kong-based airlines, helicopter operators and aircraft maintenance service agents. The compliance work of AA is reported in detail in a separate paper. The other Task Force members have reported that all their mission-critical systems had been tested and found to be Y2K compliant as from June 1999. These systems include the aircraft of the three major Hong Kong-based airlines. The Y2K compliance work for these aircraft is subject to the sample audits of CAD. The CAD Y2K Compliance Task Force is now focusing on the contingency plans developed by various Task Force members.

10. As regards the Y2K status of foreign airlines which regularly operate to or overfly Hong Kong, most of them have confirmed to CAD that their aircraft will be Y2K compliant before end 1999. For the few airlines which have yet to reply, CAD is seeking clarification from the relevant aviation authorities. The Department will also consider the mechanism to handle aircraft of foreign airlines which have not confirmed Y2K compliance before the end of 1999, taking into account any advice from the ICAO and the practice adopted by other major aeronautical authorities.

11. Since the civil aviation sector involves a large number of organisations in different disciplines, it would not be possible to have one single contingency plan to cover the entire sector. Sector-wide contingency plans are coordinated in two forums – one by CAD for the safety and security related systems and regional air traffic control and the other by the Airport Authority for the core airport operations. These contingency plans have been drawn up and drills have been conducted. More drills will be held in the next two months.

12. As part of the 9 September 1999 ("9999") rollover exercise, all key organisations in the aviation sector set up Y2K coordination centres to oversee the transition and report operational status to CAD for a consolidated 'aviation sector' report to the Government's Central Coordinating Centre. Drills to rehearse some of the contingency plans, e.g. the back-up communication arrangements, were conducted by individual organisations and witnessed by CAD as appropriate. No

malfunctioning occurred on that day. Based on the experience gained, the Y2K contingency plans are being reviewed or fine-tuned by individual organisations. Further tests and training will also be carried out in the next two months.

13. As far as transparency is concerned, CAD has kept the members of the Y2K Compliance Task Force informed of the progress of its Y2K compliance programme and contingency planning. CAD has also disseminated information on the preparation of the aviation sector for Y2K transition to the public through various means such as press and TV interviews. CAD will set up a dedicated website on Y2K transition by end October 1999.

***Marine Department (port management)***

14. Marine Department has completed the rectification work of all their mission-critical systems since September 1999. An internal audit team is performing further audits on its Y2K project.

15. The Y2K Port Management Sector-wide Contingency Plan to deal with port operation disruptions being induced by Y2K problems has been completed since June. The plan was further refined following the tests and exercises held in July and August 1999. Emergency strategies have been developed with the objective of maintaining the safe and continuous operation of the port. All practical measures have been taken to minimise the risk of Y2K failures so that the Department will be in a position to react swiftly to any Y2K induced marine incident. This includes the activation of a crisis management team, reservation of emergency anchorages and setting up a backup traffic monitoring system together with an emergency port communication channel.

16. Large scale internal and external trials of the contingency plan were successfully conducted on 2 July 1999 and 12 August 1999 respectively. The Y2K Port Management Contingency Plan had also been implemented during the critical period on 9 September 1999 and the result is satisfactory. Further trials will be conducted before the millennium rollover.

17. To promote awareness and transparency to the public and shipping community, a dedicated website has been launched and a number of seminars have been organised to introduce the progress of the Y2K compliance programme, the port management sector-wide contingency plan, container terminal sector contingency plan and International Maritime Organization's recommendations to local shipping industry. These seminars have covered contingency arrangements and special port operation procedures.

***Electrical and Mechanical Services Department (energy supply, electrical and gas safety)***

18. The Electrical and Mechanical Services Department has completed rectification work on all mission-critical systems. EMSD has also drawn up an Energy Sector Y2K Contingency Plan, incorporating the industry-wide contingency measures of the power, gas and oil companies. Two drills have taken place and the plan was tested during the rollover to 9 September 1999.

19. EMSD has engaged two consultants to review its Y2K programme and to verify the Y2K test results. EMSD had applied the methodology similar to the consultants' and performed further internal Y2K audits.

20. Since mid 1998, EMSD has been regularly updating the development of Y2K issues in the department's Y2K web-site on the internet.

***Hong Kong Observatory (meteorological service)***

21. The Hong Kong Observatory has completed all rectification work on its mission-critical systems and these systems are now fully Y2K compliant. Further review is being carried out for added assurance. Contingency plans are in place to cater for any unforeseen problems with any of the department's operational systems, including meteorological services to the public and the aviation community, before, on or after 1 January 2000. The contingency measures include manual observation with conventional sensors; weather prediction based on HKO

observational data and other meteorological information obtained via other means such as satellite broadcast from overseas centres and the internet; and dissemination of weather information, forecast and warnings by fax/hand to the Information Services Department, radio and TV stations, Civil Aviation Department and airlines. Progress of the Y2K programme has been made available in HKO's web page since early 1999.

***Agriculture and Fisheries Department (supply of fresh food produce)***

22. Rectification work for all the mission-critical computer, embedded and line communication systems in Agriculture and Fisheries Department (AFD) has been completed where necessary. All these systems are tested and verified to be Y2K compliant.

23. AFD assesses that the potential effect of Y2K-induced system failures on the supply of fresh food produce is expected to be minimal. It is because the majority of the fresh food produce consumed in Hong Kong are imported from the Mainland by road, railway and river boats or supplied by fishing vessels and the related operations do not rely heavily on computerised processing. However, the supply of fresh fruit, eggs and vegetables imported from overseas would hinge largely on the Y2K compliance of the systems at the container terminals and partly on that of the airport.

24. AFD has formulated a contingency plan to co-ordinate the various actions of the concerned Government departments and major fresh food produce importers and wholesalers to avoid possible disruption to the supply of fresh food produce in the event of Y2K-induced system failures. The contingency plan mainly involves close monitoring of the supply of fresh food produce, reporting of malfunction of computer systems, if any, at import points, and arranging for alternative sources of supply of fresh food produce. If there are indications that shortage of certain types of fresh food produce may develop, the Food Control Committee chaired by the Director of Agriculture and Fisheries and involving the concerned departments will be activated to implement appropriate measures to increase supply.

25. In early August, AFD briefed the major importers and wholesalers on the Y2K issue and asked them to stock up and explore alternative channels of supply in case of need. It will arrange similar meetings with them prior to the next high-risk dates (i.e. 1 January 2000 and 29 February 2000). AFD has provided information on the contingency plans at its website to enhance transparency.

26. AFD and the concerned departments tested the contingency arrangements through a simulated exercise on 12 August 1999. The test went on smoothly. The contingency plan was refined in the light of experience. Additional drills will be conducted on the contingency plan in the run-up to the millennium.

27. AFD runs a sector-wide coordinating centre on food supply at its headquarters during the rollover periods. The sector-wide coordinating centre collects feedback and assessment from various sources related to the supply of fresh food produce and reports the most up-to-date situation to the Central Coordinating Centre led by the Information Technology and Broadcasting Bureau. During the rollover period of the last high-risk date of 9 September 1999, the communication and assessment arrangements worked smoothly and effectively.

***Hongkong Post (postal service)***

28. Rectification work for all the mission-critical computer, embedded and line communication systems of the Hongkong Post (HKP) has been completed where necessary. All these systems are tested and spares verified to be Y2K compliant.

29. HKP assesses that the risk of a Y2K induced system failure in the department impinging on its services to the public is low. Nevertheless, it has formulated a contingency plan to ensure business continuity. The contingency plan mainly contains definitive criteria for activating contingency actions, which involve either transfer to back-up systems or switch to manual operation. The testing of the contingency plan, mainly through simulation, was completed on 15 August 1999 and the result was considered satisfactory. HKP has provided information about the contingency plan at its web site to enhance transparency.

30. The major business partners of HKP are postal administrations of other places/countries insofar as international mail is concerned. To HKP's knowledge, many of them are Y2K-ready. HKP will monitor the situation.

***Hong Kong Tourist Association (promotion of inbound tourism)***

31. The Hong Kong Tourist Association (HKTA) achieved full Y2K compliance for its internal critical business components in end June 1999 as targeted. HKTA had involved Y2K consultants from the beginning of its Y2K Programme. Moreover HKTA has been publishing its Y2K position in the HKTA's website since April 1999. Contingency plans for its identified business components have been completed and tested. These contingency plans include, for instance, pre-arranging alternative means of communications, putting in place back-up personal computers and equipment, printing back-up hard copies of important database information, as well as switching to manual operation if and when necessary. Moreover, an overall Y2K contingency plan for these business components has also been developed and was tested in September. An Internal Y2K Command Centre was also set up in the same month. An Incident Management Information Centre which aims to handle visitor enquiries during the rollover is targeted to be set up by the end of October and tested by mid-December this year. Both centres would be activated during the Y2K critical dates.

**CONTAINER TERMINALS**

32. The container terminal operators are responsible for ensuring Y2K compliance of their mission critical systems. Hongkong International Terminals Ltd (HIT), COSCO-HIT, Modern Terminals Ltd (MTL) and Sea-land Orient Terminals (SLOT) have all attained Y2K compliance for their mission critical systems as from July.

33. Each of the container terminal operators has formulated their own contingency plans for each of their mission critical terminal operation systems. They have successfully tested their contingency plans, which include carrying out terminal operations without computer system

support. In addition, all terminals have their own emergency procedures to handle various types of emergency to ensure a rapid return to service after disruptions, such as typhoons, in about three to ten hours time, depending on the severity of the storm.

34. In conjunction with the Port Management Contingency Plan (PMCP) prepared by the Marine Department, ESB has formed a port industry wide Task Group and formulated a subsidiary sector wide contingency plan focusing on the Container Terminal Sector and integrated with the PMCP. The plan has evaluated the potential Y2K risks and formulated emergency response strategies, such as spillover between terminals and diverting vessels to mid-stream or buoys to handle cargo. The contingency plans have been endorsed by the task group and distributed to the industry since June 1999. The plans have been tested on 12 August and executed on the first Y2K critical date on 9 September 1999 together with the port management contingency plan. No difficulties were experienced during these exercises. A contingency centre has been set up and will be put into operation on all Y2K critical dates to provide immediate response to any Y2K disruptions. Further exercise is planned for later in the year before the rollover to increase Y2K contingency readiness as the critical date approach.

35. The plan has been launched on Marine Department's dedicated Y2K web-site and introduced to the marine community in seminars.

**ENERGY SUPPLY SECTOR**

36. This section covers the following companies -

- The Hongkong Electric Co., Ltd (HEC)
- CLP Power Hong Kong Ltd (CLP Power)
- Hong Kong Nuclear Investment Co. Ltd (HKNIC)
- The Hong Kong and China Gas Company Ltd (HKCG)
- The five oil and liquefied petroleum gas (LPG) suppliers.

37. The electricity, towngas and oil suppliers have reported that their mission-critical systems are fully Y2K ready. They are confident

that their systems will operate during the Y2K period, however, contingency plans have also been in place to cope with unexpected difficulties.

38 Officers of the Electrical and Mechanical Services Department (EMSD) are maintaining close liaison with all of the companies concerned over Y2K compliance and have visited the companies to examine their compliance programmes and contingency plans. Regular progress reports are sent to the Information Technology and Broadcasting Bureau in line with the standard reporting procedures. Relevant information about the power and towngas companies could be found on their respective websites.

**The Hongkong Electric Co., Ltd**

39. HEC reported that all rectification work on their computer systems and embedded systems had been completed and that these systems were Y2K compliant as of 30 June 1999. The compliance status of all of the systems concerned has been verified through thorough testing. The tests included setting forward the system clocks of generating units to December 1999 and operating the units in normal production use for more than 60 days.

40. HEC's contingency plans against Y2K-induced problems in different functional areas have been in place since May 1999. They have been tested in August 1999 and their validity has been confirmed. An integrated company-wide contingency plan to deal with any Y2K-induced incidents has also been drawn up and was tested for its validity in August 1999. Additional drills and training will be conducted in the next few months. HEC will run four generating units during the rollover period, providing more capacity than is needed to meet normal demand in winter time. Of these, three have analogue controls (which have no digital components), and are therefore not at risk from Y2K. During the rollover period, HEC will set up a Y2K co-ordination centre equipped with diversified communication systems, double the operational staff at Lamma Power Station and have engineers standing by at all zone substations to ensure fast response to any unforeseen events.

41. All aspects of HEC's Y2K preparations have been reviewed by independent consultants. The review concluded that HEC's compliance programme was appropriate and satisfactory and that the risk of having serious disruption of operations due to date-related failure of any of HEC's systems was very low.

**CLP Power Hong Kong Ltd**

42. CLP Power reported that all rectification work had been completed and that all of their electricity supply and delivery and other operational and business systems were Y2K ready as from 22 June 1999. The compliance status of all of the systems concerned has undergone thorough testing, including the setting forward of the system clocks of generating units. The preparations have been reviewed by the company's internal auditors and independent consultants. The independent consultants concluded that CLP were 100% Y2K ready and were in a position to effectively deal with any Y2K-induced issues that might arise.

43. CLP Power have put in place contingency plans against Y2K-induced problems in different functional areas and an integral company contingency plan since end-June 1999. Training and drills have been carried out. Demand on CLP's system during the rollover period is expected to be about one-third of the available generating capacity. The demand will be met from separate power stations, using a variety of fuels and generating technologies, so as to minimise the risk of a single failure causing a major reduction of electricity supply. Standby spinning reserve will be increased substantially. Engineers will be on standby at critical system facilities. On-site and standby engineering and operational staff will exceed 1,500 people. Diversified communication systems will be used.

44. CLP Power have also maintained close liaison with HKNIC, with whom they are interconnected, on Y2K readiness efforts at the Guangdong Nuclear Power Station.

**Hong Kong Nuclear Investment Co. Ltd**

45. HKNIC reported that the Y2K readiness programme for the Guangdong Nuclear Power Station (GNPS) has been prepared by specialist teams with support from technical, internal audit and quality assurance teams within the Guangdong Nuclear Power Joint Venture Company (GNPJVC) and is based on international guidelines and practices. According to HKNIC, the GNPS is 100% Y2K ready. HKNIC also reported that nuclear safety at the GNPS would not be affected by the Y2K issue. Whereas Y2K is a computer-related issue, the operation of the nuclear safety protection functions in the GNPS does not require a computer. The protection function is activated by events and not by time. Y2K issues, therefore, could only affect plant availability, not safety. The Y2K readiness work at the GNPS have been reviewed by the International Atomic Energy Agency, the National Nuclear Safety Administration and an independent consultant from the United States of America. The reviews endorsed the Y2K readiness programme and the quality of the work at GNPJVC.

46. An integrated contingency plan has been in place since June 1999 and was satisfactorily tested in September 1999. Again, the plan has been reviewed by the International Atomic Energy Agency and the National Nuclear Safety Administration. During the millennium rollover, one of the generating unit will be on a scheduled shutdown for refuel and maintenance, while the other one will operate at reduced power. The station will have 100 more staff on standby and have multiple means of communication. Work will continue to train GNPS personnel, conduct drills and refine the contingency plan throughout the remainder of 1999.

**The Hong Kong and China Gas Company Ltd**

47. HKCG reported that their compliance programme was planned and implemented based on international standards. All rectification work on systems relating to the safe and reliable supply of gas, customer services and internal systems has been completed and these systems were Y2K compliant from 30 June 1999. The compliance status of all of the systems concerned has been verified through testing.

The tests included setting forward the clocks of critical systems in the gas production plant, the pressure monitoring system of the gas distribution network and the information systems. HKCG's Y2K compliance programme has been reviewed by the company's internal auditors, EMSD and independent consultants and assessed to be appropriate and satisfactory.

48. HKCG have produced contingency plans to cope with any Y2K-induced problems in different functional areas. Under the witness of EMSD, the validity of these plans was tested in May and June 1999 and the testing result was satisfactory. The company-wide contingency plan has been in place since August 1999. It has been drilled and confirmed adequate on the first Y2K critical date (i.e. transition from 8 September 1999 to 9 September 1999). HKCG have arranged for additional supplies of fuel for their back-up power generators in the unlikely event of loss of electricity supply. During the rollover period, an emergency control centre will be set up and more than 1,100 staff will be on standby at different critical points in the towngas network. A recovery plan for resumption of gas supply has been prepared for use in the unlikely event that gas production is interrupted as a result of Y2K-related problems.

**Oil and LPG Suppliers**

49. All the five oil/LPG suppliers operating in Hong Kong reported that they achieved 100% Y2K compliance and their business contingency plans were ready as of 30 September 1999. EMSD have attended drills carried out by the oil companies in connection with simulation of Y2K rollover and their contingency plan. In addition, during August and September 1999, EMSD approached and visited the oil companies on their Y2K contingency plans and examined the reports of the audits conducted by their parent companies to assure that the coverage of the contingency plans and audit reports are in order. The whole assurance exercise is scheduled to be completed by the end of October 1999.

**Sector-Wide Contingency Planning**

50. EMSD will set up the Energy Sector Co-ordination Centre (ESCC) at its Headquarters during the Y2K critical periods to facilitate communication within the energy supply sector and to assist the Central Co-ordinating Centre of the HKSAR Government to monitor the sector.

51. To further enhance the reliability of supply of energy for the whole community, companies of the same industry have got together to develop sector-wide Y2K contingency plans. The two electricity supply companies have developed a plan with the objectives to maintain uninterrupted supply of electricity in Hong Kong and, in case of power outage, to resume the services as quickly as practicable. For towngas supply, as HKCG is the sole supplier in Hong Kong, their contingency plan forms the sector-wide contingency plan.

52. In mid-August 1999, EMSD assisted the oil industry to work out the sector wide contingency plan for the industry. During the meetings, the oil industry agreed to incorporate the oil industry's current "borrow and loan" practice in the sector-wide contingency plan for several critical petroleum products. As for LPG supply, the usual stock cylinder LPG and bulk LPG supply in housing estates would last for more than 2 weeks and 4 days respectively. However, all oil companies have agreed to keep one-day additional stock at their terminals to meet emergency requirement.

53. The industry would also advise their customers to top up the diesel tanks for standby generator sets before the rollover. To cater for the scenario of prolonged power supply outage, contingency plan for diesel fuel delivery would be put in place and such a plan is being finalised by the industry, Government and parties concerned.

## Annexes

54. Detailed progress reports provided by the various energy supply companies concerned are attached as Annexes to this paper.

Economic Services Bureau

October 1999

List of Annexes

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| Annex C | Hong Kong Nuclear Investment Co., Ltd. (HKNIC) |
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# Progress Report on Year 2000 Compliance

The Hongkong Electric Co., Ltd.
香港電燈有限公司

## CURRENT Y2K COMPLIANCE STATUS

As of 30 June 1999, all our computer systems and embedded systems are already Y2K compliant. Different divisions within Hongkong Electric (HEC) have compiled and validated their own contingency plans which have also been approved by the top management. The integrated corporate-wide contingency plan is now in place to deal with any unforeseen Y2K-induced incidents. Electricity industry-wide contingency plan has also been established with CLP Power to provide mutual support. Rehearsals of these plans have been conducted to ensure that all employees understand their roles and responsibilities during the Millennium rollover.

## CONTINGENCY PLANNING

Despite the efforts we have made and the fact that every Y2K compliance project is on track, nobody can guarantee that systems that have been renovated and tested will not suffer from unanticipated Y2K-induced problems. To facilitate our planning work, the Nuclear Utility Year 2000 Readiness Contingency Planning (NEI/NUSMG 98-07) from the Nuclear Energy Institute and Nuclear Utilities Software Management Group has been adopted as the planning methodology. References have also been made to the NERC (North American Electric Reliability Council) Contingency Planning Guide Version 1.0 over the course of our planning. By May 1999, all functional units have devised their contingency plans to deal with different failure scenarios. A set of our contingency plan has been submitted to EMSD for their reference.

A series of drills to evaluate the validity of our contingency plans were started in February 1999 and were completed in August. For example, the execution of contingency plan to cater for the scenario where the Energy Management System fails to operate and engineers have to be deployed to zone substations to assume local control have been rehearsed two times by the end of April 1999. These exercises not only offered excellent opportunities for us to verify our plans, but also helped our employees get familiar with the alternative ways of supporting our critical operations.

## KEY Y2K RISK MITIGATION MEASURES

As a responsible essential service provider, we are committed to providing our customers with reliable supply of electricity before, during and after Year 2000. We are currently equipped to handle unexpected disruptions and already have extensive backup facilities in place. Our key Y2K risk mitigation measures include:

# Progress Report on Year 2000 Compliance

The Hongkong Electric Co., Ltd.
香港電燈有限公司

## Generation Capacity

Based on the current forecast of electricity demand in the coming New Year's Eve, we will run four generating units and the total capacity will be more than the normal demand in winter time. Besides, of all the units to be run, 3 are units with analog control (i.e. no digital components, including real-time clock) and therefore do not have any date-related problem.

## Material

Materials like water, coal, oil, gases, chemicals, limestone, sulphur, etc., will be stocked up to the maximum level prior to the transition period(s). For example, our coal yard will be filled to its highest permissible level that is adequate to support more than 6 weeks of consumption. Besides, we will arrange a fully loaded coal ship at our jetty during the key rollover periods. For water, we will fill up all reservoirs to maximum operating level that is sufficient to supply the Lamma Power Station for 10 days.

## Manning

To cater for any unforeseen situation, a total of 900 employees will be either on duty or standby at home during key rollover periods. Specifically,

1. Operation staff at Lamma Power Station will be doubled during critical transition periods. In addition, a special Y2K emergency response team will be on-site to resolve any unanticipated date-related problems. Engineers stand by at home will be contacted and, when necessary, return to the power station immediately.

2. To minimise the impact of Y2K-induced problem on our transmission and distribution network, we will have engineers stand by at all zone substations during critical dates. If necessary, they will take switching and operational instructions from system control centre and monitor the network through local alarm panels. When necessary, we will mobilise stand-by engineers at other strategic locations such as North Point Electric Centre to handle emergency repair works.

## Critical Venues

Critical venues such as hospitals will be put into our "Supply Priority List". In addition, our engineer will standby at the Hong Kong Jockey Club Happy Valley Race Course where the Millennium Celebration will be held.

## Transmission & Distribution Network

Interconnection circuits between HEC and CLP Power are in proper working condition and electricity can always be exported to or imported from CLP Power when necessary. No maintenance works on these interconnectors will be performed on critical dates in order to maximise the resilience of the power grid of Hong Kong.

### Y2K Co-ordinating Centre

A Y2K co-ordinating centre will be set up and management representatives at the centre will be responsible for co-ordinating internal operations and communicating with external organisations during critical dates. We will employ different communication facilities such as PABX, trunk radio, fixed telephone line, mobile phone, and in-house video conferencing facilities for both external and internal communication. In the event of communication failures we will be able to switch to alternative means while continuing to receive and disseminate information.

We will establish direct telephone lines to the Y2K co-ordinating centres of the Fire Services Department, and EMSD to facilitate effective communication.

## EXTERNAL COMMUNICATION

Keeping our customers, investors, business partners, and the Hong Kong SAR Government abreast of the progress of our Y2K programme is critical to the success of our strategy for Y2K compliance. As Year 2000 looms closer, public concern about the Y2K vulnerability of essential service providers is growing. As a co-operative and responsible utility company, we are not only exercising our due diligence to ensure the Y2K compliance of our systems, but also doing our very best to keep our stakeholders informed. Specifically,

- We are reporting to the Hong Kong SAR Government on our Y2K compliance progress on a monthly basis.

- We have participated in Y2K seminars organised by the Hong Kong SAR Government, the Hong Kong Productivity Council, and other professional organisations such as Hong Kong Institution of Engineers (HKIE) and Institution of Electrical Engineers (IEE).

- We are also disclosing information about our Y2K programme in the format of progress report and FAQ (Frequently Asked Questions) through our corporate website (www.hec.com.hk) to help customers understand our approach to achieving Y2K compliance and boost the Y2K awareness of the general public. A leaflet informing our customers of our Y2K readiness was also distributed in August.

- We have attended experience-sharing meeting organised by industry bodies such as the Hong Kong Retail Management Association, and major customers such as the Mass Transit Railways Corporation and Hospital Authority.

- We will continue to inform the public and other organisations of our Y2K position. For example, a presentation for the Hong Kong Police Force will be conducted in November to help the police officers understand the comprehensiveness of our Y2K contingency measures.

## INDEPENDENT REVIEW

Arthur Andersen has performed an independent review to assist the management in evaluating the Year 2000 preparations of Hongkong Electric. The review covered the following aspects of our Year 2000 compliance process:

- Management & organisation awareness
- Inventory list
- Impact analysis and project planning
- Rectification & resolution
- Testing
- Contingency planning

The result of the review concluded that the Y2K compliance programme is on track and the risk of having serious disruption of operations due to date-related failure is very low.

## CONCLUSIONS

As a responsible essential service provider, we have invested financial and technical resources to implement our strategy for Year 2000 compliance. Our Y2K compliance programme is based on best practices. To date, all our systems are already Y2K compliant and we have also devised contingency plans to deal with different credible failure scenarios. We believe that the Y2K issue will not have impact on our ability to maintain a reliable supply of electricity and quality customer services before, during and after Year 2000.

Annex B

中華電力
CLP Power

# CLP Power Hong Kong Limited

# Year 2000 Readiness Programme

# Progress Report

# October 1999

Presented to the Economic Services Panel
Legislative Council, HKSAR

15 October 1999

# CLP Power Year 2000 Readiness

## 1. Progress of Y2K Readiness Programme and rectification work

A total of 1516 systems covering the company's entire business operations, ranging from IT-related systems to process control systems in generation and power systems, were certified as 'Y2K ready' on 22 June 1999.

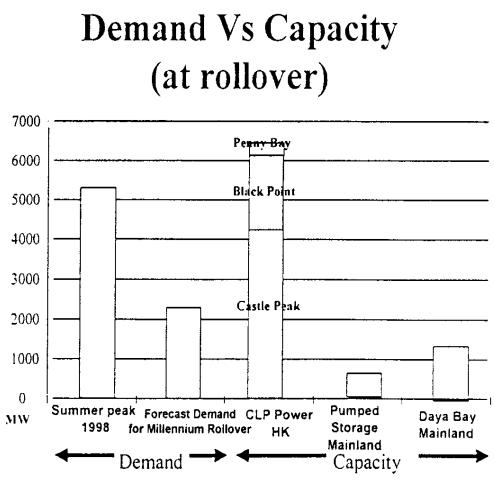
## 2. Contingency Planning

On 29 June 1999, CLP Power completed its Y2K Contingency Plans. Y2K Operational Plans associated with GPHC and HEC were also agreed and approved by appropriate interconnection parties.

All drills have been conducted with some of them witnessed by third parties including an external auditor and EMSD of the government. The drills included: loss of Automatic Generation Control, loss of telecommunication, loss of Energy Management Systems and loss of load. Other related tests included mutual transfer and decoupling test.

Interconnected parties have been consulted on the readiness of their systems. Specifically, Guangzhou Pumped Storage Power Station and Guangdong Nuclear Power Station have been reporting their progress, which appears to be satisfactory so far. In addition, CLP Power has maintained close contact with Hong Kong Nuclear Investment Company – 25% shareholder of Guangdong Nuclear Power Joint Venture Co., Ltd. – on Y2K readiness efforts at Guangdong Daya Bay Nuclear Power Station. Hong Kong Electric has also reported satisfactory progress. Notwithstanding that these interconnected parties have reported to have made good progress on their Y2K programme, CLP Power has normal Operational Plans so that in the event of a supply disruption by an interconnected party, CLP Power is able to disconnect rapidly, and rely on its own generated power.

CLP Power generation demand over the New Year and the Leap Year periods is expected to be about one third of its internally available capacity. The demand will be met from separate power stations, using a variety of fuels and multiple technologies. This will reduce the risk of a single failure causing a major disruption of electricity supply. Additional man-power located at strategic locations combined with adequate stockpiles of fuel and spares have been planned to further mitigate the short to medium term risks.



## 3. Sector-wide Contingency arrangements

A meeting was held with ITBB/EMSD on 23 July 1999, with representatives from both CLP Power and HEC, to discuss the energy sector-wide arrangement during the New Year Eve rollover. The arrangement on the sector-wide organisation, communication channels and reporting format to HKSAR was finalised and tested successfully on 9 September 1999.

CLP Power will also take into consideration the priority list to be prepared by ITBB/EMSD in an event of a supply disruption.

## 4. Transparency

A number of meetings with customers and community representatives were organised by CLP Power. A Y2K communication seminar for the financial community was held in May 1999 and another seminar for major customers was held on the 29 September 1999, with over 200 participants. Mr. William Tang of ITBB attended this seminar and made a presentation on the Government's sector-wide preparation. Customer liaison, begun in 1997 on the Y2K issue, has continued to be a key focus of the CLP Power Y2K programme.

The CLP Power's Y2K web page has been constantly updated to give current development on CLP Power Y2K Readiness Programme. Bill inserts on Y2K information were also sent to customers together with their bills.

A third party audit was carried out in the period 5th -29th July, 1999 by an external consulting company, ICS. Based in Australia, ICS is a renowned Y2K auditing expert. It has undertaken Y2K audits for over 20 power companies around the world. Their audit report was delivered to CLP Power in August 1999. A copy was also sent to ESB and ITBB. The following Y2K audit findings are extracted from ICS's report, which is very positive.

"The level and detail of CLP Power's Y2K project including contingency plans and testing work done to date shows that CLP Power is in a position to effectively deal with any Y2K issues that may arise. The threat to supply reliability has been dramatically reduced through the project. When compared to similar Y2K programs within the power industry, CLP Power is well advanced. The overall or integral Y2K contingency plan development process is one of the best seen by the auditors."

Close communications with the EMSD and major customers will be maintained during the affected Y2K periods.

## 5. Conclusion

With the satisfactory completion of all readiness tests, CLP Power is confident that it will continue to provide reliable electricity services to the Hong Kong community over all Y2K-critical dates.

Even in the unlikely event of a Y2K-related incident affecting any part of our supply chain, CLP Power's contingency plans are in place to ensure that resources will be available to maintain supply reliability.

Annex C

***HKNIC***

**An update on Year 2000 readiness work for**
**Guangdong Daya Bay Nuclear Power Station**

For Presentation to the Legislative Council Panel on Economic Services

on

25 October 1999

by
Hong Kong Nuclear Investment Company Limited

(19 October 1999)

## EXECUTIVE SUMMARY

- The paper is a revision to an earlier paper provided to the Legislative Council Economic Services Panel Meeting on 19/7/1999, to provide an update mainly on contingency planning activities completed since mid July 1999.

- Hong Kong Nuclear Investment Company (HKNIC) is a minority investor owning 25% of the Guangdong Nuclear Power Joint Venture Company (GNPJVC), which operates the Guangdong Daya Bay Nuclear Power Station (GNPS).

- Despite its minority shareholding, HKNIC has actively carried out its role in monitoring the safe and efficient operation of GNPS, by contributing managerial expertise and monitoring GNPS operation. HKNIC keeps Hong Kong SAR Government and the public informed of all events of safety significance following its policy of transparency.

- The objectives of the Year 2000 (Y2K) readiness work at GNPS are to ensure that nuclear safety is not affected by the Y2K issue, and that the issue will not affect business continuity and in particular electricity generation at GNPS.

- GNPS has been working to international guidelines in its Y2K readiness programme and contingency planning. The work is supported internally by quality assurance and audit activities, and externally by overseas peer utilities, IT consultants and equipment suppliers. The work has also been reviewed and endorsed by established national and international organisations, including International Atomic Energy Agency (IAEA) of the United Nations, Commission of Science Technology and Industry for National Defense of the State Council and in August, National Nuclear Safety Administration (NNSA).

- The expertise of HKNIC at GNPJVC has contributed to the technical management of the Y2K programme, and HKNIC has engaged a US based consultant to review progress.

- All work to achieve Y2K readiness for the station has been completed in early July 1999 and GNPS is 100% Y2K ready.

- The work leads to the conclusion that nuclear safety at GNPS will not be affected by the Y2K issue. This is because Y2K is a computer-related issue, but the protection operation of safety systems in GNPS does not require a computer, and the protection function is activated by events and not by time. The findings are consistent with the findings in Western countries using similar reactor equipment.

- GNPJVC completed an Integrated Contingency Plan by the end of June 1999. The purpose of the plan is to mitigate or restore from the consequences of a potential Y2K induced event and to maintain smooth operation. The plan has been reviewed by IAEA and NNSA, and has been exercised during the rollover to 9/9/1999 with satisfactory results. Work has been continuing since July 1999 to train station personnel, conduct drills and refine the plan, so that GNPS will be ready for the millennium rollover and other computer sensitive dates.

## 1 BACKGROUND

Hong Kong Nuclear Investment Company Limited (HKNIC) is a member of the CLP Group and owns 25% of Guangdong Nuclear Power Joint Venture Company (GNPJVC). GNPJVC owns and operates Guangdong Daya Bay Nuclear Power Station (GNPS). HKNIC buys 70% of the electricity from GNPJVC, for sale to CLP Power Hong Kong Limited which supplies electricity to customers in Hong Kong.

As an investor and a corporate citizen, it is in HKNIC's interest to monitor the safe and efficient operation of the nuclear power station. HKNIC has been actively carrying out this role by contributing managerial expertise through its experienced assignees in key managerial positions at GNPJVC. HKNIC also monitors the operation of GNPS by obtaining regular reports from GNPJVC. HKNIC reports the operation of GNPS to its Board of Directors, which includes two senior government officials, the Secretary for Security and the Secretary for Economic Services.

In keeping with its policy of transparency, HKNIC also keeps the Hong Kong SAR Government and public informed of all events of safety significance at GNPS. This has been done through reports to the Government and a monthly operational bulletin to the media and community leaders. The bulletin has been replaced by an internet website (www.hknuclear.com) earlier this year for reaching out to a wider audience. Information on the website is updated on a monthly basis.

It is widely recognised that the Y2K issue comes from the practice of using only the last two digits to express the year in a computer data. The use of such two-digit dates in data processing or computation over the change from 1999 to 2000 will lead to inconsistency, which if not properly allowed for, may give incorrect records or results. This issue may also affect process control computers and instruments containing microprocessors. Since a modern nuclear power station employs computers and instruments in its operation, concerns have been occasionally raised on the extents to which a nuclear power station may be affected.

This paper provides an update of the Y2K readiness work of GNPS since the previous paper for the Legislative Council Economic Services Panel Meeting on 19/7/1999. With Y2K readiness already achieved and a contingency plan in place, GNPS is on-course in its preparation for the millennium rollover and other computer sensitive dates. The work has been performed in line with international practices and timescales, and has been endorsed by independent and authoritative organisations. Salient findings of the work are that the Y2K issue will not affect nuclear safety, and that the Y2K risk to station availability is very low. These findings are consistent with those in the West. Furthermore, business continuity at GNPS is well assured since the station is making good preparations for operations to meet the Y2K issue. This paper will elaborate on these statements.

## 2 THE METHOD

### 2.1 Objectives of the work

A system is Y2K ready if it will function into the next millennium as intended. The Y2K readiness programme for GNPS has two main objectives. The first one is to ensure, through remedial work if necessary, that the issue will not affect nuclear safety at GNPS. The second objective is to ensure that the issue will not have a material impact on business continuity at GNPJVC, in particular the availability of electricity supply from GNPS to Hong Kong and Guangdong.

Nuclear Safety

Nuclear safety requires that the Y2K issue will not lead to an unsafe operation of the station that in turn leads to an unwarranted release of radioactivity, causing a health risk or damage to the environment. It therefore requires that the reactor will shutdown safely if required.

Availability of supply

Availability of electricity supply requires that the Y2K issue will not affect electricity generation at GNPS.

### 2.2 The method

The Y2K readiness programme for GNPS can be divided into two broad categories, namely, Y2K readiness and Y2K contingency planning.

Work on Y2K readiness is based on the guidelines provided by national organisations in the US and UK, namely the Nuclear Energy Institute in the US on Y2K readiness, and of the British Standards Institution in the UK on managing Y2K conformity, and the Institution of Electrical Engineers in the UK on embedded systems. Experience of members of the World Association of Nuclear Operators (WANO) has also been used for reference.

Work on Y2K contingency planning is based on the guidelines of Nuclear Energy Institute on contingency planning.

The work is under the leadership of the general management and is carried out by various specialist teams responsible in their normal duties for the operation and maintenance of the equipment or software. The teams are supported by peer technical groups, internal audit and quality assurance teams within GNPVC, as well as external resources. GNPJVC has used over 600 man-months for the work.

The work is supported by active exchanges with equipment suppliers, members of WANO and Framatome Reactor Operator Group formed by the six utilities who share the same reactor equipment supplier Framatome, and services from local and overseas IT consultants. These exchanges are held regularly and they are useful in bringing in current international experience so that GNPJVC may adopt the world’s best practice.

## 2.3 Y2K Programme for GNPS

GNPJVC began preparation to address the Y2K issue in early 1997 and launched its Y2K programme in February 1998.

The programme covers all system containing process computers or embedded computing devices at the station or related to station operation. There are 214 items and they are classified according to their significance for priority action.

Overall guidance for the work is given in a Y2K project manual developed by GNPJVC, covering the overall approach, work procedures, internal audit, quality assurance programmes and contingency planning guidelines specific to the Y2K activities, based on the references given in section 2.2. The Y2K programme for GNPS is divided into the following main categories:

Y2K Readiness
- Initial investigation, liaison for supplier certification, confirmation and review
- Impact analysis
- Planning, testing and investigation
- System modifications
- Testing for acceptance
- Documentation

Y2K Contingency Planning
- Contingency Plans
- Millennium rollover plan
- Staff familiarisation, training and drills

# 3 STATUS

## 3.1 Y2K readiness

All work to achieve Y2K readiness for GNPS has been completed in early July 1999. The station is 100% Y2K ready.

The detailed Y2K work at GNPS leads to the following conclusions:

- Nuclear safety at GNPS will not be affected by the Y2K issue. This is because Y2K is a computer-related issue, but the protection operation of safety systems in GNPS does not require a computer, and the protection function is activated by events and not by time. Moreover, the station will always be fail-safe, that is, it will enter a safe condition should a failure occur.

- The risk to station availability is very low, since the equipment directly associated with station operation is not affected by the Y2K issue.

The above conclusions are in line with the findings of the international nuclear industry on the Y2K issue.

The Y2K issue is found to affect only systems peripheral to the operation of the station. As indicated above, all rectification work has been completed and the station is now Y2K ready.

### 3.2 Y2K contingency planning

Contingency Planning

By June 1999, GNPS has completed an Integrated Contingency Plan which includes 40 contingency plans. These plans make reference to the relevant GNPS procedures for operations and contingency actions and form an additional layer on to the existing emergency response procedures. They aim at securing the following:

- Electrical and electronic systems under nuclear safety classification or required for station operation
- Off-line monitoring and data acquisition systems
- Power transmission systems
- Telecommunication system
- Key consumables

The aims are achieved by having procedures to recover key systems, maintain diverse means of communication and adequate stocks for key consumables, with the most serious possible consequence of failure being the safe shutdown of a nuclear generating unit.

Operation plan for millennium rollover

With the nuclear power station having achieved Y2K readiness and an Integrated Contingency Plan in place, GNPJVC has been refining plans for safe and normal operation of the station and on the grids during the rollover period. Salient points in the plan are:

- Unit 2 on planned annual refuelling outage
- Unit 1 on reduced power output
- Increasing manning level
- Diverse means of internal and external communication

The millennium rollover coincides with the usual practice of conducting annual refuelling outage for GNPS in winter. With the operating Unit 1 at reduced output, it will reduce the impact of an unplanned loss of generation on the grid and mitigate the consequence of a disruption to the customers.

Increasing the manning level by about 100 will provide additional support to the operators and the emergency response team in monitoring the status of the power station and in effecting measures in the contingency plans, if needed.

Diverse means of internal and external communication will include the provision of separate channels through optic fibre, microwave, power line carrier and satellite phone to supplement commercial telephone services. They will support power dispatch and to secure liaison during an emergency.

Similar level of attention is also given to other computer-sensitive dates such as the leap year problem dates of 29/02/2000 and 01/03/2000.

Preparation

GNPJVC has begun testing and refining the contingency plans. Staff training and preparation for drills have begun in July and will complete by October 1999, with refresher courses to follow. General training will be provided to all technical staff. However, training will be concentrated on the staff for station operation, as well as for electrical, electronic and instrumentation maintenance through seminar and practical work. Operator training will include the use of a full-scope simulator to cover infrequent operations that may be required to mitigate the offect of hypothetical Y2K induced events. The work is on schedule.

Preparation is also being made on a general drill in November 1999 and it is on schedule. The drill will involve all internal parties, in particular the operators of the station and essential maintenance personnel.

Rollover to 9/9/1999

Rollover to 9/9/1999 was accomplished without incidents. The station activated its Y2K contingency team to rehearse the rollover plans for computer sensitive dates, and electricity output from the two generating units were reduced as a precaution. The rollover was completed with stable power generation and no anomaly being observed. The Y2K team stood down a few hours after midnight and the two units were returned to full power.

## 4 VERIFICATION

Verification is an essential element since it provides evidence to the quality of the work and its credibility. At GNPJVC, verification activities are held regularly to lend support to the quality of its Y2K work. In addition, independent third-party verification activities are held to substantiate GNPJVC's programme and its findings.

### 4.1 Internal Verification

GNPJVC's quality assurance and audit teams have held internal inspections according to its quality and audit programmes. The inspections concluded that both the progress and quality are satisfactory.

## 4.2 External Reviews

HKNIC has engaged a US based consultant James Martin & Co to conduct an independent third-party review of the Y2K readiness work and contingency planning at GNPS. The review programme began in mid June 1999 and reported satisfactory findings of the Y2K work. The consultant is presently following the programme to its end in March 2000.

There have been independent, external reviews on the Y2K work at GNPJVC by:

- International Atomic Energy Agency (LAEA) of the United Nations

  The agency is a United Nations organisation for promoting the peaceful use of nuclear energy. It offers review activities to nuclear utilities in the world on best practices in operating nuclear power stations.

- Commission of Science Technology and Industry for National Defence of the PRC State Council

  The Commission reports directly to the PRC State Council and oversees national development in scientific, technological and defence activities.

- National Nuclear Safety Administration of PRC

  The Administration is a regulatory body which issues operating licences and oversees safety at nuclear installations in China.

- Hartford Steam Boiler Inspection and Insurance Company

  Hartford Steam Boiler Inspection and Insurance Company is the largest provider of equipment breakdown insurance in the world. Its parent company, the HSB group, is a leading provider of insurance products and engineering management consulting services in 80 countries. In electricity generation, HSB provides insurance to about one quarter of power generating capacity in the US.

- Electricite de France and Framatome

  Electricite de France (EdF) is the national electricity utility in France. Its 58 nuclear power generating units supply about 75% of the electricity in France. Framatome is the designer/supplier of the nuclear power stations for France and has a number of exports to five countries.

- American Nuclear Insurers

  American Nuclear Insurers is an underwriting organisation created by some of the largest US insurance companies. It has been providing insurance and re-insurance services to the nuclear industry for more than forty years.

All these reviews endorsed the Y2K readiness programme and the quality of the work at GNPJVC.

### 4.3 Relevant international experience

Various international bodies have confirmed that the Y2K issue is not a nuclear safety risk to their nuclear power stations. The experience is relevant to GNPS and is consistent with its findings.

Since GNPS shares the same reactor supplier with France, favourable findings in France offer assurance to the reactor equipment at GNPS.

In addition, since the Y2K work at GNPS is based on the guidelines of the US and UK, favourable reviews of the Y2K readiness work carried out in these countries support the method adopted for GNPS.

Relevant experience in France, the US and UK is presented in Appendix 1.

## 5 Conclusions

Year 2000 readiness work at GNPJVC has been carried out to international practices, to comparable level of quality assurance and along a similar time scale as in the West. The work has been reviewed and endorsed by established national and international organisations. GNPS is now 100% Y2K ready.

The above work leads to the conclusions that nuclear safety will not be affected by the Y2K issue at GNPS, and that the risk to its station availability is very low. These findings are consistent with findings in Western countries using similar reactor equipment or similar Y2K work methodology.

In addition, GNPJVC has put in place a set of contingency plans and is refining operational plans for the millennium rollover and other computer-sensitive dates, to ensure business continuity and to mitigate the impacts of unlikely disruptions. These plans have been developed based on Western practices and have also received the endorsement of international and national authorities. Staff training and preparation for the effective implementation of the plans are on schedule, with a successful rehearsal of the plans on 9/9/1999.

Information on the issue is regularly updated and is available to the public on HKNIC's website, www.hknuclear.com.

**APPENDIX 1**

## RELEVANT INTERNATIONAL EXPERIENCE ON Y2K READINESS ACTIVITIES

France

In France, the national electric utility EdF announced in April 1999 that "in case of failure of data processing systems, the safety of nuclear power plants is ensured by mechanical safety devices (such as rod cluster control assemblies) which are not concerned by the changeover to the year 2000."

The EdF finding is consistent with and gives support to the finding at GNPS on the nuclear safety of its reactor equipment. EdF declared Y2K readiness in July 1999.

The US and UK

In the US, the North American Electricity Reliability Council reported to the United States Department of Energy in April 1999 that "no utility has found a Y2K problem that would have prevented safety systems from shutting down a plant, if conditions required after the turn of the century. Thus, Y2K problems in nuclear facilities do not represent a public health and safety issue."

The United States Nuclear Regulatory Commission (NRC) has carried out audits to evaluate the effectiveness of the measures undertaken by the operators of US nuclear utilities to identify and correct Y2K problems. In April 1999, it announced that "the NRC has no indication that significant Y2K problems exist with safety-related systems in nuclear power plants for those systems that directly affect the ability to safely operate and shut down the plants. All plants can be shut down safely, if necessary, after January 1, 2000." Though 30 of over 100 operating units in the US were not yet Y2K ready at the end of July 1999, their safety systems were all Y2K ready and with good programmes in place, NRC judged that it did not warrant exercising its jurisdiction of shutting down these units.

British Energy is the main operator of the nuclear power stations in the UK, supplying some 25% of its electricity. 99% of its "essential" and "business-critical" systems were completed in May 1999, with the remaining 1% completed by October 1999. It announced earlier that it "has not identified any residual problems or issues that will interfere with our objectives of ensuring that we achieve safe and continuous operation."

In addition, the Director of the Nuclear Safety Directorate in the UK reported in September 1998 that "a UK nuclear installation would safely shutdown if a serious date-related failure were to arise."

Consistent findings of the utilities and the regulators in these two countries offer confidence in the thoroughness in their Y2K readiness programmes. Since the GNPJVC Y2K work is based on their guidelines, favourable reviews of the Y2K readiness work carried out in these countries support the method adopted for GNPS.

Annex D

## Introduction

The Hong Kong and China Gas Company Limited (Towngas) launched a comprehensive corporate-wide Year 2000 (Y2K) programme in 1996 and achieved 100 percentages Y2K compliance in June 1999. We aim to eradicate the Y2K problems in all the systems and equipment, especially the mission-critical computer and embedded systems related to the safe and reliable supply of gas. At the same time, we have developed a contingency plan and gas supply recovery plan to prepare for, albeit the remoteness, some part of our business being affected by the Y2K problem, including those experienced by third parties such as customers, suppliers, contractors and business partners.

## Purpose of this Report

This report addresses four areas of Y2K concern:

1. The latest position of Towngas' Y2K programme and the compliance work; and
2. The contingency arrangements; and
3. Independent third party endorsement; and
4. Transparency to the public.

## Towngas' Priorities in Handling the Y2K Problem

The handling priority is defined in the following descending order of importance:

1. Gas production and gas distribution systems which safeguard a safe and reliable supply of gas.
2. Systems which provide customer services.

3. Internal management and operation systems.

## Critical Dates

Same as those of the Information Technology Broadcasting Bureau (ITBB), Towngas has defined its critical dates as follows:

- 8 September 1999 to 9 September 1999 (which has been successfully rolled over with no exception identified)
- 31 December 1999 to 1 January 2000
- 28 February 2000 to 29 February 2000
- 29 February 2000 to 1 March 2000

On the above critical dates, special risk mitigation and contingency arrangements will be in place to ensure a smooth rollover. These measures have been well proven on 8 September 1999 by the seamless transition to 9 September 1999. The details will be described in the following sections.

## Approach

Towngas has adopted a 4-pronged comprehensive approach to tackle the Y2K problem. It comprises system review and upgrade, contingency planning, gas supply interruption and recovery planning, and supplies management.

### 1. System Review and Upgrade

System review and upgrade is divided into three phases with well-documented results and follow-up actions.

Phase 1 Planning

In 1996, the project methodology and organization were established to form the "backbone" on which comprehensive project plan, milestones, deliverables, resources allocation and framework were devised.

Phase 2 Risk Assessment

In 1997, all the items were reviewed to identify the ones that might be affected by the Y2K issue. This was followed by an assessment of their impact on the business. Each item was classified according to its impact and the above handling priorities while resources were prioritized accordingly. Finally, detailed action plan and resources requirement were established.

Phase 3 Implementation

In 1998, retrofit/upgrade was performed on non-Y2K compliant items. This was followed by due diligence user acceptance tests to confirm the retrofit/upgrade has been properly done. In order to ascertain the supplier's/vendor's written confirmation claiming the item was Y2K compliant, sample verification tests were carried out on critical items. Our handling approach was the more critical the item, the more extensive the test.

Current Status of Y2K Compliance

At of 30 June 1999, all of our systems relating to the safe and reliable supply of gas, the provision of external customer services, and the support of smooth internal operation were already Y2K compliant in accordance with the BSI standard (same as the standard used by the SAR Government).

| Systems relating to: | % of Compliance | Completion Date |
|---|---|---|
| Safe and reliable supply of gas | 100% | 1Q1999 |
| Provision of customer services | 100% | 1Q1999 |
| Internal systems | 100% | 2Q1999 |

## 2. Contingency Planning

The following contingency arrangements were executed on 8 September 1999. The successful rollover to 9 September 1999 proved that these arrangements were both adequate and workable, and the stand-by programme run-down was smooth. The arrangements can be classified into the following areas:

### 2.1 Command, Direction and Monitoring

On the critical dates, Towngas will operate a Corporate Emergency Control Centre (CECC) in the North Point main control centre at 22:00 hours. It is directed by the Corporate Emergency Management Team (CEMT), which consists of the Managing Director, Executive Committee members and senior management, to monitor and control the Y2K transition. The CECC is a command centre which coordinates various departments and aligns their resources. It will receive Y2K readiness report from the line departments at designated times. It will manage internal corporate Y2K incidents and closely monitor external Y2K problems of the community and overseas. After the successful rollover, the CEMT will decide the appropriate time to stand down emergency arrangements.

## 2.2 External Communication

To prepare for the possible failure of the telephone communication systems, Towngas has set up an alternative communication channel using its exclusive radio frequency communication system. During the critical dates, stand-by emergency staff will be equipped with the radio equipment for communication with North Point main control centre. In addition, our dual-channel radio communication system will be backed up by an emergency system to maintain essential and emergency communication in case the telephone network fails totally.

In order to communicate with major business partners, a Y2K Hotline, manned by experienced Y2K personnel, will be set up during the critical dates. It will establish dedicated communication channels, such as telephones, mobile phones, pagers and facsimile, for receiving and disseminating corporate Y2K messages. It will make the communication arrangements with the major business partners in advance and then verify such arrangements on the critical dates to ensure the communication link has been set up.

The published Customer Service Hotline telephone numbers will continue to be available to the public and will be manned by additional Customer Service Officers. To provide additional backup to the existing telephone system, we have also leased temporary mobile telephone numbers from four different service providers to be used on the Y2K critical dates.

Towngas has maintained close relationship and high transparency with the government via the Economic Services Bureau (ESB) and Electrical and Mechanical Services Department (EMSD). Communication arrangements on the critical dates have been made in advance with the EMSD. Communication channels using various means; including facsimile, land-line telephone system (PABX), mobile phones from different service providers, and Towngas' exclusive

radio equipment, will be set up and tested to confirm workable beforehand. On the critical dates, there will be regular communication with the EMSD on Towngas' Y2K status at designated times.

### 2.3 Manpower Stand-by

On the critical dates, there will be more than 1,100 emergency staff standing by at various strategic locations, including Fire Services Department Headquarters Command Centre, Chek Lap Kok Airport, etc.. All the gas production plants, control centres and strategic pressure-reduction stations will be manned with additional trained staff. We will also arrange motorcycle riders to stand by at major depots for emergency message delivery in case other communication means fail.

### 2.4 Gas Production Plants

Three tiers of contingency arrangements for the operational control of the gas production facility have been planned for:

1. Honeywell TDC3000, the main computer system which performs remote monitoring and control of the gas production process.
2. Emergency Operator Stations (EOS), the parallel backup of the Honeywell TDC3000 computer system. The system clocks in the EOS have already been rolled forward to the Year 2000 since the end of Year 1998. To date, the gas production system has been operating smoothly without exception.
3. Manual operation as a last resort. Local monitoring devices have been installed in the Tai Po gas production plants to assist plant operators to perform manual control in the unlikely event that all automatic control systems including Honeywell TDC3000 and the EOS back-up fail.

All the critical gas production equipment (such as pumps, etc.) in Tai Po plant are supported by un-interruptible power supply (UPS), independent electricity generators or diesel prime movers/engines. In order to prepare for prolonged power supply outage, the electricity generators and diesel prime movers/engines will be manually started up before the transition period. They will be running in stand-by mode, in parallel with the main electricity supply from the CLP Power, during the transition period. With these arrangements in place, it is extremely unlikely that the gas production process will be affected in times of electricity supply interruption.

Diesel tanks will be topped up before the critical dates. A stand-by diesel tanker has been arranged with an oil company to provide additional fuel for the electricity generators. Additional tankers will also be available whenever necessary. The on- site fuel will last for twenty six hours of operation if required.

The Ma Tau Kok plant is operated by mechanical-based control systems, and as such is not susceptible to the Y2K problem. All the gas production trains in Ma Tau Kok will be in hot stand-by mode ready to back up Tai Po gas production plants.

### 2.5 Gas Supply Network

On the critical dates, Towngas will activate the Back-up Grid Control Centre in Ma Tau Kok to run in parallel with the North Point Grid Control Centre. The clock of the back-up computer system has, since May 1999, been rolled back one year. The backup system has been tested to confirm that it can properly perform all critical functions as those of the main system.

Two hours before the Y2K transition, we will disable the electronic control devices in all the offtake (regional pressure-reduction) stations. As such, the stations will be operated locally and manually with mechanical control. Electronic clocks in strategic governors (local district pressure-reduction installation) will also be disabled beforehand. Engineering emergency staff will stand by at all the strategic pressure-reduction stations along the entire gas supply network.

### 2.6 Information Systems Supporting External Customer Services

The information systems and computer hardware, which support the provision of customer services, have been successfully retrofitted and was Y2K compliant since October 1998. Nonetheless, the Information Technology Department (ITD) will set up standalone database servers, which are loaded with essential customer data, in the Customer Service Hotline and ITD Helpdesk. Adequate support staff will be standing by in these locations ready to provide data retrieval support. The main data centre in the North Point control centre is fully backed up by a hot stand-by centre in Ma Tau Kok which keeps store up-to-date data at all times.

To prepare for the unlikely event of prolonged information systems outage, a standalone database server will be placed in each of the critical customer centres. With these measures, even under such circumstances Towngas will be able to maintain essential customer service and minimize any impact on customers.

## 3. Gas Supply Interruption and Recovery Plan

In order to make the contingency arrangements complete, Towngas has prepared a load shedding deployment plan and a gas supply resumption plan for the fastest resumption of gas supply to the customers.

Towngas will make every endeavour to maintain a continuous gas supply to critical customers such as hospitals and Chek Lap Kok Airport. Any supply interruption will only be taken as the last resort and carried out in the order of criticality. In the unlikely event that Y2K problem occurs, our stand-by staff will visit the affected critical customers to update them on the gas interruption situation and recovery schedule.

Once the upstream gas supply is resumed, our emergency staff will immediately re-commission the gas supply to individual customers in the order of their criticality.

### 4. Supplies Management

There will be full stock of naphtha (material used to produce town gas) and water reserve on the critical dates to prepare for Y2K contingency. Extra stock buffer of gas appliances has been arranged with the suppliers. We will also monitor the suppliers' Y2K situation on the critical dates.

## Independent Third Party Endorsement

### 1. Independent Assessment by the HKPC

In order to evaluate the adequacy and quality of our Y2K programme critically, we have invited the Hong Kong Productivity Council (HKPC) to engage in an independent assessment of Towngas' Y2K preparedness.

The assessment was carried out in June 1999 and the report was issued in August 1999. The scope of the assessment included the following areas:

1. Whether the management of Towngas has taken the necessary measures to resolve the Y2K issue; and
2. How the internal and external risks relating to Y2K issue are managed within Towngas.

Based on the interview with senior management and review of documentary evidence, the consultants in the HKPC concluded that:

- Towngas has done sufficiently to monitor the progress of the programme.
- Towngas has managed the third-party risks well.
- Due diligence work is very well documented, including correspondence with different parties, meeting minutes, inventory lists and the corresponding action plans.
- The general awareness of the Y2K issue among staff is good, in particular the Executive Committee and senior management are well informed of the status on a regular basis.

All in all, the consultants from the HKPC are confident that Towngas will not encounter major problems during the transition to the next millennium.

## 2. Monitoring by the EMSD

As the Government's agent responsible for assuring the public that Towngas' Y2K problem has been properly dealt, the EMSD has reviewed our major deliverables from each stage. They have reviewed the contingency plans of major functional areas, corporate emergency plan and independent assessment report written by the HKPC. They have also participated in various discussion forums hosted by the Towngas and the ESB to ascertain our Y2K readiness, and witnessed the physical rehearsals of our contingency plans. Based on their review so far, no exceptions

have been identified by the EMSD. The EMSD is content with the information we provided to them.

Based on the positive confirmation from the HKPC and the EMSD regarding the adequacy of our work done, we believe that we are well prepared for the next major Y2K critical date (i.e. 31 December 1999).

Our external auditor Price WaterhouseCoopers has assessed our Y2K programme in the "going concern" perspective and verbally concluded that Towngas has taken the necessary steps to be Y2K compliant. As such, there is no need for a separate in-depth special assessment.

**Transparency to the Public**

**1. High Visibility Maintained with the Hong Kong Government**

Towngas has maintained close and regular contact with the Government via the Economic Services Panel of the Legislative Council (Legco), the ESB and the EMSD. We submit regular status report and attend periodic progress update meeting of the Legco and the ESB. We have taken the initiative to present to the EMSD our Y2K programme in the initial stage. As the programme rolls out, we discuss issues with them openly to seek their opinion. So far, our working relationship has been very satisfying.

**2. Communication with Business Partners**

In order to manage the possible risks from critical vendors and customers in the supply chain, we have extended our Y2K programme to major suppliers, customers and utilities.

We have initiated experience-sharing discussions with major suppliers, customers, insurers and other business partners. We have also attended a number of cross-company meetings organized by major customers and government departments. In order to enhance communication with our major suppliers, our senior managers have paid overseas visits to several major suppliers to share with them our Y2K programme and to access their Y2K readiness.

## 3. Publicity Programme Targetted at Customers

Towngas has a comprehensive communication programme which keeps our customers and the general public up-to-date about our Y2K programme and progress:

- We have set up a Y2K web page on the Internet. It is being regularly updated with the latest Y2K information.
- We have printed Y2K corporate messages on the gas bill.
- We sent Y2K bill insert to all our customers in September 1999.
- We have issued press releases and published articles in professional magazines in the past year.
- We were interviewed by the media and have made presentations in public discussion forums. More than sixty clippings were generated.
- Y2K leaflet will be available for the general public in all the customer centres.
- We have publicized our Y2K preparedness in the customer newsletter Focus.

## Conclusion

Towngas has long recognized the possible impact resulting from the Y2K problem if it is not attended to, and has been diligently implementing a series of measures to tackle it. In addition to system review and upgrade, contingency arrangements have been established to prepare Towngas for the unlikely occurrence of the Y2K problem. These arrangements have been rehearsed on the first Y2K critical date (i.e. 8 September 1999). The successful rollover to 9 September 1999 has given Towngas added assurance that the contingency arrangements are adequate and workable, inter-departmental coordination is properly aligned and stand-by programme run-down is smooth. We will continue to review the result and streamline the contingency arrangements for the next major Y2K critical date (i.e. 31 December 1999).

With these measures in place and the drill on the contingency arrangements we held on the first Y2K critical date, we are confident that Y2K will not lead to any interruption of a reliable gas supply or affect safety of our gas supply installations. It is also unlikely that customer service will be adversely affected.

# Esso's Year 2000 Programme

## Y2K Compliance Status

The first four steps in the implementation of our Year 2000 programme; namely inventory, assessment, testing and remediation have been underway since 1997. These are designed to locate and correct with all reasonable endeavours potential Y2K problems. As of 31st July 1999, all our critical systems and equipment are Y2K ready.

## Contingency Planning

We have developed various Business Contingency Plans according to our company's guidelines. Firstly, safety, then adequate staffing, communication plans and other considerations are taken into account in developing these plans.

## Command Centre

We will set up a command center in our office located on 19th floor of Central Plaza for the rollover. This command centre will be manned by senior managers who will manage and coordinate rollover activities. Communications with our regional centre and third parties'/EMSD command centres or contacts will be maintained. These include periodic wellness reporting, site verification checks and event reporting, etc.

## Drills

Drills have been carried out by various business units according to their Y2K scenarios. Representatives from GSO were present at one of the drills at piped-in estate. During 8th/9th September, 1999 transition, we conducted a drill for the command centre, which included reporting to GSO's Y2K Coordination Centre.

## Quality Assurance

Our contingency plans have been reviewed by a designated independent assesment team comprising of personnel from affiliates to ensure quality.

## Sector-wide Continuity Measures

We have participated in meetings with representatives from other oil companies with an aim of assuring supply of products to essential services providers. The oil industry presented the draft of the measures to ESB during the sector-wide meeting on 5th Oct., 1999.

# Caltex Companies (Greater China )Limited
# Note on Year 2000 Compliance Progress for the Legislative Council Panel on Economic Services Meeting 25th October 1999

Progress as at 30th September 1999

In Hong Kong Caltex has completed the four steps of its compliance programme:

1) Inventory
2) Business Risk Analysis
3) Year 2000 Risk Analysis
4) Action Plans Including Contingency Plans

The Y2K readiness status of all business systems (IT systems) and technical systems (embedded systems) has been determined and the tasks identified in the action plans have been completed. All systems that were determined to be a high risk to the business have been tested to confirm their Y2K readiness. Systems that have been modified or upgraded as part of the programme have been tested to confirm their Y2K readiness. All systems are Y2K ready now.

In addition, for systems that had been determined to be high business risk, contingency plans are in place to ensure that there are procedures for system recovery in the event of unpredicted failure and that there are business continuity procedures to mitigate the impact of system failure during the system's recovery period.

A business chain review has been conducted and discussions held with key business partners to determine their preparedness for Y2K. For processes involving those business partners determined as high business risk contingency plans are in place to mitigate the impact of any problems experienced by those business partners.

Ends.

# Shell Hong Kong Limited (SHKL) Y2K Readiness
## A Briefing Paper for the Legislative Council Panel on Economic Services

As at 1 October 1999, SHKL has completed Y2K rectification and testing for all its critical and non-critical systems covering the company's entire business operations in the Hong Kong SAR.

Based on the guidelines from our Group, a set of Y2K Business Contingency and Continuity Plans (BCCPs) covered our critical business areas / processes were completed and endorsed by management. Drills covered our Tsing Yi Installation (of which was witnessed by senior officers from EMSD of the HKSAR Government) , LPG outlets and retail filling stations were completed with satisfactory results. Scenarios used for these drills included total loss of electricity power and loss of various computer and automation systems from operations to interface with customers.

On 8 October 1999, SHKL has completed its internal audit carried out by auditors from the Shell Group on Y2K BCCP and Remedial Programme Close-out Review. This is the third audit carried out by Shell Group auditors since 1998. The overall conclusion of this audit was "satisfactory" of which is the highest ranking in the Group's definition.

A Y2K Emergency Response Centre (ERC) will be set up at our Tsing Yi Installation to co-ordinate internal operations and external communications during critical dates. This ERC will be manned with sufficient level of manpower and be in charged by management representative to handle enquiries and emergencies.

Co-ordinated by EMSD, sector-wide contingency arrangements were discussed to facilitate co-operations amongst the oil industry during the roll-over periods.

Communication is a key focus in our Y2K programme. We have been maintaining active communications on our Y2K programme, both internally and externally, with our stakeholders, e.g. employees, customers, suppliers, business partners, media and the HKSAR Government.

SHKL is confident that we are Y2K ready and the Y2K issues will not have impact on our ability to maintain a safe and reliable supply of fuels and other petroleum products to the territory before, during and after the millennium.

Annex H

華潤石化(集團)有限公司
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OUR REF. NO.

發文日期
DATE

# China Resources Petrochems (Group) Y2K progress

With the definition of computer system compatibility toY2K stipulated by Government as fundamental base, China Resources Petrochems (Group) hereby set up the Y2K working target.

Since the beginning of 1998, CRPC has reckoned the potential risk of Y2K, a complete and comprehensive Y2K planning was thereby established, along with the formation of Y2K working group, conducted directly by Director. The working group is specifically organized for practicing, monitoring the proceeding Y2K plan, providing technical support where as needed, as well as reporting the Y2K working progress to the Group.

With huge effort including manpower as well as other resources being input, the existing computer systems, including the computer systems of the Group, electronic systems and automatic monitoring system, were upgraded so as to conform to Y2K. The upgrading process was finished in June 1999.

A thorough Y2K contingency plan was also established in July 1999, so as to minimize any influence on the operation of the Group as much as practically possible, in case any unexpected and uncontrollable emergency is encountered.

In order to ensure against safe and smooth millennium leap, a mimic Y2K practice and testing were performed on 11 September 1999. The practice contained a mimic crossover of year 2000, exercising of contingency plan and test for contingency plan upon electricity termination. No significant problem was indicated nor found in this testing program. We are hence more convinced with successful millenium crossover with having undergone the practice well.

*CRPC Y2K working group*
14 October, 1999

Annex I

**Mobil Oil Hong Kong Limited**

By Fax (2868-4679)

October 20, 1999

Economic Services Bureau
Government Secretariat
Central Government Offices
Lower Albert Road
Hong Kong

Dear Sir/Madam,

The possibility of computers and electronic equipment having problems on December 31, 1999, is the subject of a growing number of news stories. Whether it's called the Y2K bug, the millennium bug, or just the Year 2000 problem, much is being said. Some reports predict that the sky may fall, others say there's nothing to worry about.

Since Mobil Oil Hong Kong Limited's operations in Hong Kong has such a visible presence in the community, and we widely use computers and other electronics in our operations, I wanted to tell you what we've been doing to prepare for the new millennium.

Mobil began its Y2K evaluation in 1996 when a team of technical professionals began to evaluate the company's equipment and systems. Their findings led to the formation of the "Millennium Project" team, which immediately launched an intensive campaign to identify, evaluate, test and fix potential glitches in Mobil systems. Some 250 employees have worked on this project full-time and another 1,500 have made contributions.

Locally, our goal is to ensure that the Year 2000 arrives safely for our employees and neighbors, problem free for our customers, and without an environmental incident. This has been of the highest priority and has received the full cooperation of everyone here.

I'm optimistic that our preparedness has identified and addressed potential concerns that might have caused a problem. The work has been painstaking and thorough. And testing has also been a key component of our program. We've designed and run tests around various scenarios based on what a particular application or process control device does. It's not been easy, but we've given the most critical applications and control systems a very, very high level of attention.

Some people have asked me if we'll have shortages of gasoline or other petroleum products the first week of the year 2000. There will be no problems if Mobil has anything to do with it. The oil industry's supply chain is very efficient. We've proven ourselves able to manage many disruptions, including natural disasters and global disturbances. So without a prolonged disruption - and I really don't see a prolonged disruption - we feel it's highly unlikely that you'll see any shortages as a result of the year 2000.

But what if something happens that's out of our control? To address that situation, we have refined our business continuity and contingency plans, just as we do every day for any emergency situation. In addition, there are many automatic shutdown and safety systems built into our processes that are triggered in case an emergency situation arises.

While the concern generated around the "Y2K bug" may have outgrown its true threat, we determined early on to address it as a real threat in order to be prepared regardless of its impact. As a result, Mobil will be more reliable, will operate more cost-effectively and will have safer systems to carry it into the new millennium.

I hope this information will give you the confidence that Mobil is doing its part to prepare for the year 2000. Should you have any questions about our preparation for the new millennium, please let me know.

Sincerely,

Stephen S. F. Wong
VP - Hong Kong
Mobil Oil Hong Kong Limited