

For Discussion  
on 10 May 1999

**LegCo Panel on Health Services**  
**Year 2000 Compliance**  
**in Public and Private Health Sectors**

***Background***

‘The Y2K Problem’ refers to problems in computer systems arising from the use of two digits to denote the year. Computer systems and computer-aided systems could be affected when the date rolls over from the year 1999 to 2000. It is thus essential that health care providers work on this problem to ensure that the concerned systems can deliver safe medical service to patients at the turn of the Millennium.

2. This paper provides Members with information on the progress of Y2K compliance work undertaken by the Hospital Authority (HA) as well as private hospitals and nursing homes, which are registered under the Hospitals, Nursing Homes and Maternity Homes Registration Ordinance (Cap. 165).

3. The Information Technology and Broadcasting Bureau (ITBB) is overseeing the Y2K compliance status and progress of all government departments and non-government organisations which provide essential services to the public. In the health sector, the Health and Welfare Bureau (HWB) monitors the Y2K compliance progress of the HA and private hospitals and nursing homes through the Department of Health (DH), which is their licensing body.

4. HWB set up a Steering Committee on Y2K Compliance in the Health Sector (the Steering Committee) in 1998 to closely monitor the Y2K compliance progress in the health sector. The Steering Committee is chaired by Deputy Secretary (Health and Welfare) with members from the HA, DH and the Electrical and Mechanical Services Department (EMSD). Progress reports on Y2K compliance status from HA and DH are examined and discussed by the Steering Committee at its regular meetings.

## **Public Health Sector**

### **Year 2000 (Y2K) Project in the Hospital Authority**

5. The Hospital Authority (HA) attaches great importance to and has made substantial progress in resolving the Y2K problem and in ensuring that all mission-critical services and facilities will not be affected by the “millennium bug”. As at mid April 1999, 96% of all mission-critical equipment/systems in HA are Y2K compliant. Rectification for the remaining equipment/systems is targeted to be completed by June 1999.

6. At the Hospital Authority Head Office (HAHO) level, a Y2K Steering Committee headed by a Deputy Director (Operations), who reports to the Chief Executive of HA directly, has been set up and empowered to formulate work plans for timely resolution of all Y2K problems. The committee comprises representatives from EMSD, IT staff, a Senior Physicist, Engineers and Senior Managers from HAHO and hospitals. Day-to-day monitoring of the Y2K project is undertaken by five Y2K Sub-Committees, responsible for the implementation of the work plans for IT Systems, Line Equipment, X-ray Equipment and non X-ray Medical Equipment, Paging Systems, and Engineering Systems respectively. At the hospital level, Y2K Committees have been established with designated Y2K coordinators to monitor the progress of the Y2K project.

7. Apart from implementing work plans to solve the Y2K problems, raising staff awareness on the problem is also an important aspect of work under the HA’s Y2K project. The HAHO has undertaken a number of initiatives to raise staff awareness on Y2K problem through the organization of Y2K seminars and briefing sessions for Clinical Specialty Coordinating Committees, doctors and other staff groups’ Consultative Committees as well as placing Y2K information on the intranet. At the hospital level, similar activities have been initiated through local seminars and briefing sessions to the Clinical Management Teams.

### **Affected Equipment/Systems in HA**

8. The following mission-critical equipment/systems may be susceptible to the Y2K problems -

(A) Administrative (Information) Systems

- (i) Corporate Mainframe
- (ii) Corporate Non-mainframe
- (iii) Non-corporate Information Systems

(B) Non-Administrative (Computer-embedded) Equipment/Systems

- (i) Medical Equipment (X-ray and Non X-ray equipment)
- (ii) Paging System (Hospital Installed)
- (iii) Engineering Equipment (e.g. Central Control and Monitoring System (CCMS), Fire Alarm System)
- (iv) Line Communication Equipment (e.g. PABX, intercom)

9. For corporate and non-corporate information systems, Y2K testings have been conducted to verify their Y2K status. For computer-embedded equipment/systems, their Y2K compliant status can only be ascertained by the manufacturers, as the embedded chips may not be accessible for testing. Nevertheless, appropriate tests have been conducted on equipment/systems for which Y2K testing is technically feasible. These include most of the non X-ray medical equipment and engineering equipment which have been tested by EMSD and EMSD/consultant firm respectively.

**Administrative (Information) Systems**

10. Administrative (Information) Systems are susceptible to Y2K problems. Y2K non-compliance may result in systems failing to function properly, e.g. failure of the computerised medical records tracing system in tracing medical records.

11. As at mid April 1999, all of the three HA mainframe systems are Y2K compliant, while 98% of the 50 mission-critical non-mainframe systems and 89% of the 150 mission-critical non-corporate information systems are Y2K compliant respectively. The target is to achieve 100% Y2K compliance for all these administrative systems by June 1999.

**Non-Administrative (Computer-embedded) Equipment/Systems**

12. Medical equipment can be classified into the following levels of risks as a consequence of the Y2K problem:

<u>Level of Risk</u>	<u>Potential Problems</u>
(i) Level I (Fatal)	- Life threatening, immediate and direct harm to patients or essential services could not be provided
(ii) Level II (Critical)	- May produce incorrect results leading to wrong treatment decision but no direct or immediate harm to patients
(iii) Level III (Marginal)	- May cause minor inconvenience or annoyance, mainly recording errors
(iv) Level IV (No impact)	- No problem since the equipment has no date function or known use of the date function

### **X-Ray Equipment**

13. All X-ray equipment are being classified as fatal and critical in their risks of developing Y2K problems. This is because many X-ray equipment have embedded computers chips which control the function of the equipment and perform high-speed calculations during image reconstruction and analysis. Computers are also indispensable in transferring data from one X-ray equipment to another in planning and treatment processes. As a result, Y2K non-compliance may affect diagnostic and treatment accuracy. For example, since images of organs may not be properly produced or captured by non-compliant Gamma Cameras, the patient's organs functions may not be accurately assessed.

14. As at mid April 1999, 88% of the 751 mission-critical pieces of X-ray equipment are or have been rendered Y2K compliant. There is some slippage in the original programme for rectification of X-ray equipment because of delay by suppliers in providing upgrading kits due to global demands. One X-ray equipment classified at Level I/II risk is scheduled for replacement by a new machine in the third quarter of 1999. The replacement of this equipment is not critical to the operation of the hospital, as there is a second machine which is Y2K compliant in operation in the same hospital. All the remaining Y2K non-compliant equipment will undergo rectification according to schedule for completion by June 1999.

### **Non X-Ray Medical Equipment**

15. HA has analysed the criticality of all 80,000 non X-ray medical equipment. None of these equipment was found to pose level I (fatal) risks. About 18,000 pieces were classified as having level II (critical) risk. As at mid April 1999, 96% of these mission-critical non X-ray equipment are Y2K compliant. The rectification of all non-compliant equipment will be completed by June 1999.

### **Implant & Home-use Equipment**

16. HA has identified around 500 items in 50 types of implant and home use equipment being used by HA patients, such as pacemakers, haemodialysis machines and nebulizers, which have potential Y2K problem. Following enquiries to the concerned manufacturers/vendors for confirmation on the Y2K status, all but one of these equipment were found

to be Y2K compliant. The non-compliant equipment was identified with a date display problem which would not adversely affect patient safety.

17. HA will issue a pamphlet in June 1999 to inform the general public and the health care professionals of the progress of the Y2K project in HA as well as some of the Y2K compliance status information on implants and home-use equipment.

### **Paging Systems**

18. Based on vendors' confirmation, out of a total of 25 mission-critical paging systems in HA, only two are found to be Y2K non-compliant. The two non-compliant systems had been rectified.

### **Engineering Systems**

19. Hospital engineering system, such as lifts/escalators, air-conditioning units, fire services installations, central control & monitoring system are potentially affected by the Y2K problem. Y2K non-compliant equipment may affect the normal functioning of the systems, e.g. faulty room temperature control or false alarms of the fire alarm system. Y2K testing and assessment for Schedule I and II hospitals were conducted by EMSD and an engineering consultant firm respectively. As at mid April 1999, 98% of 2376 mission-critical engineering systems in HA are found to be Y2K compliant. All non-compliant engineering equipment will be rectified by June 1999.

### **Line Communication Equipment**

20. Y2K status assessment by major equipment vendors and the Office of the Telecommunications Authority (OFTA) were collected by HAHO. As at mid April 1999, 90% of 180 mission-critical line communication equipment have been rendered Y2K compliant. All Y2K non-compliant line communication equipment will be rectified by June 1999.

### **HA Funding Arrangements**

21. The estimated one-off Y2K project budget is \$165.95M comprising \$33.5M for Administrative (information) Systems and \$132.45M for Non-Administrative (Computer-embedded) Systems. A

total provision of \$385 million is available under Head 514 Hospital Authority Subheads 977 and 978 in the 1999-2000 Estimates for HA to rectify before 1 January 2000 critical IT, medical, engineering and communication equipment which are not Y2K compliant.

### **HA Contingency Planning**

22. The HA Y2K Contingency Planning Task Force was established under its Y2K Steering Committee in January 1999. Its role is to formulate detailed HA-wide contingency planning framework covering all key clinical and non-clinical areas to deal with all unforeseen and uncontrollable events, such as sudden influx of patients or other Y2K induced problems. The Task Force has also initiated contingency preparation by requesting suppliers of drugs, essential supplies and public utilities to confirm that their services would not be affected by the Y2K problem. Based on these HA-wide contingency plans, hospitals will be completing the development of their own detailed Y2K contingency plans tailored to their specific environment by June 1999. As an integral part of the contingency plan, alternate mode of operations are being developed to ensure the provision of essential hospital services during the Y2K rollover.

23. The HAHO and Hospitals Y2K Contingency Response Teams will be in operation from the evening of 31.12.1999 till 2.1.2000. Headed by senior HAHO/hospital staff and other supporting/clinical staff, the team serves to coordinate and monitor the emergency response actions in all HA hospitals. Depending on the scale and seriousness of the Y2K-related incident, activation of the Y2K emergency plans will be triggered off by either the HAHO Control Room, the Hospital Chief Executives (HCEs), Y2K Co-ordinators, Ward/Department Managers etc. Inter-hospital networking and support arrangements will be in place to cater for large scale emergency situations.

24. In preparation for the Y2K rollover, contingency drills involving government departments, e.g. FSD and EMSD, will be arranged from July to December 1999 to test the effectiveness of these plans. Furthermore, HA will participate in the Government's overall inter-departmental contingency preparations to cater for the Y2K rollover. Between now and the Y2K rollover, the standing emergency procedures of HA will enable HA to deal with all emergencies, including those related to the Y2K high risk date.

### **HA Y2K Project - Progress Reporting**

25. HAHO's Y2K Contingency Planning Templates have been submitted to the Health and Welfare Bureau (HWB) in late March 1999 and detailed hospitals' Y2K contingency plans will be submitted in June 1999. HWB will monitor further progress of HA's contingency planning work through the monthly Y2K progress reports as well as reporting in HWB's Y2K Steering Committee meetings.

## **II. Private Health Sector**

### **Extent of Y2K Problem in Private Hospital and Nursing Homes**

26. As at 15 April 1999, there are 12 private hospitals and 21 nursing homes registered under the Hospitals, Nursing Homes and Maternity Homes Registration Ordinance (Cap. 165).

27. As most of the services in nursing homes do not rely on computerized systems, the Y2K problem is not a major issue in most nursing homes. Only two nursing homes reported that rectification works were required in their institutions.

28. On the other hand, the management of all the 12 private hospitals recognize that any failure of administrative systems and medical equipment arising from Y2K compliance problem will have significant impact on patients. In fact, all private hospitals have responded promptly to the call for action.

### **Liaison between Department of Health and the institutions**

29. DH maintains a close liaison with the private hospitals and nursing homes on Y2K compliance. In 1998, the private hospitals and nursing homes were advised by DH to initiate Y2K rectification works in respect of all systems and equipment maintained by their institutions. Guidelines to raise the awareness of the Y2K problem in medical devices and embedded systems have been circulated to these institutions.

30. The 12 private hospitals and 2 nursing homes requiring rectification work are required to submit a progress report on the progress

of the rectification work. Since January 1999, the frequency of these progress reports has been increased to once a month.

**Action taken**

31. In order to accord prime importance to the issue, supervisory staff is appointed to co-ordinate the Y2K compliance work in each institution. They were asked to draw up an inventory of all medical and non-medical equipment and systems, and assess the risk level to the patients of each equipment in case it fails.

32. Written confirmation would be sought from suppliers for all equipment and systems on their Y2K compliant status. Technical staff of the hospital and the maintenance firms would perform rollover testing on equipment to confirm the Y2K status. For equipment found to be Y2K non-compliant, replacement or upgrading would be carried out.

33. DH carried out inspections in all private hospitals to validate the progress reports. During these inspections, confirmation letters from suppliers and the Y2K compliant labels on the equipment were examined.

**Contingency Plans**

34. Each private hospital and nursing home was required to develop a contingency plan identifying and addressing possible areas of emergencies so as to better prepare for any unexpected equipment failure during the transition from 1999 to 2000. Examples of such emergencies are power failure, water and gas shortage, failure of whole computer system or stand-alone electronic or laboratory equipment, shortage of supplies and communication failure.

35. Strategies such as manual mode operation, use of back-up machines or service, deployment of additional manpower and acquisition of additional stock of drugs and medical supplies would be applied. All private hospitals have been advised to provide support to each other and public hospitals in case there are excessive demand arising from system failure elsewhere.

**Latest Position**

36. As at 15 April 1999, the 14 institutions requiring Y2K rectification work, namely the 12 private hospitals and 2 nursing homes, reported that on average 88% of their critical systems are confirmed and tested to be Y2K compliant. For the remaining 12%, as at mid April 1999, 68% of the required rectification work has been completed. As most of these Y2K non-compliant equipment are stand-alone systems and there are alternatives in the hospitals, it is envisaged that the operation of these private hospitals would not be seriously affected should there be any delay in the delivery of replacement items.

37. The remaining nursing homes have been reminded to develop contingency plans to deal with problems arising from failures of public utilities. All the 14 private institutions are confident that they will achieve Y2K compliance on the critical items by September 1999.

Health and Welfare Bureau

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