CHAPTER 9

THE GOVERNMENT OF THE
HONG KONG SPECIAL ADMINISTRATIVE REGION

GENERAL REVENUE ACCOUNT

GOVERNMENT SECRETARIAT

Information Technology and Broadcasting Bureau

The Year 2000 Problem

Audit Commission
Hong Kong
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THE YEAR 2000 PROBLEM

Contents

THE YEAR 2000 PROBLEM

Summary and key findings

A.   **Introduction**.   The practice of using a two digit year in computer systems has created what is known as the Year 2000 Problem (Y2K Problem) or the " Millennium Bug" . The Y2K Problem is not just a computer issue; it is a business problem that could threaten the effective functioning of the global community in the next millennium. In our daily lives, computers and microchip-embedded equipment control diverse and wide-ranging operations such as flying and navigation of aeroplanes, salary payments and medical equipment. If the bugs in these computers and equipment are not corrected, the Y2K Problem will result in system failure, errors and widespread disruption to both the Government and the community (paras. 3 and 12).

B.   **Risks to government services.**   Government services and operations could be seriously affected if the Government does not take adequate steps to ensure that its critical systems are Y2K compliant. The Y2K Problem could affect key government functions such as health care, emergency services, immigration controls and revenue collection systems (para. 14).

C.   **Audit review.**   Audit carried out a review to provide an independent   check   to   ascertain   whether   the   Administration   is addressing this issue adequately and effectively. The audit set out to primarily assess government organisations' preparedness for the Y2K Problem and, to a lesser extent, the awareness of and preparedness for the problem in the private sector. Audit conducted a survey of policy bureaux and government departments through a detailed questionnaire. To assess awareness and preparedness within the private sector, questionnaires   were   also   issued   to   private   sector   organisations, including non-government organisations funded or regulated by the Government (paras. 26 and 27).

Government organisations

D.   **Government   action.**   Government   action   has   not   been comprehensive, coordinated or systematic. Until the establishment of the Information Technology and Broadcasting Bureau in April 1998, there was no dedicated body with responsibility for the coordinated whole-of-government approach to the Y2K Problem (paras. 50 and 69).

E.   **Slow progress.**   Audit considers that the overall rate of progress in the public sector has been slow, with the majority of government organisations behind schedule in their Y2K programmes.   Of the 74 government organisations which are affected by the Y2K Problem, 40 organisations (54%) were still in the process of completing their impact assessments as at 31 January 1998 and three (4%) had yet to start the task.   If the current rate of progress is maintained, there is a risk that many government organisations will be unable to convert all of their systems and equipment by year 2000, including many which are critical to the Government's operations (paras. 59, 132 and 133).

F.   **Audit   recommendations.**   To   ensure   that   the   Government's critical operations are not adversely affected by the Y2K Problem, Audit has recommended that the Administration should urgently address a number of issues, as follows:

    (a) approach Y2K as a business problem and introduce a top-down
        approach   by   critically   examining   its   whole-of-government

strategic direction (first inset of para. 154);

(b) prepare a strategic plan to underpin its Y2K activities on a whole-of-government basis for the critical period ahead (second inset of para. 154);

(c) determine and prioritise whole-of-government business-critical systems and equipment to be converted (para. 134(h));

(d) establish appropriate mechanisms to monitor the progress of the whole-of-government Y2K programme (fourth inset of para. 154);

(e) set a strict timetable for the completion of each phase of the Y2K compliance programme (third inset of para. 154);

(f) provide urgent assistance and guidance to those government organisations which are behind schedule (para. 134(a)); and

(g) direct all government organisations to commence planning for contingencies (para. 134(j)).

Private Sector

G.   **Y2K preparedness.**   The results of Audit's survey of private sector organisations indicate that, although awareness of the issue is high, there is still a long way to go in addressing the Y2K Problem. Almost 90% of the organisations want more initiatives from the Government to enable them to solve the Y2K Problem.   The Government has failed to address the Y2K Problem in the private sector in a comprehensive, coordinated and systematic way (paras. 206 and 207).

H.   **Audit recommendations.**   To ensure that Hong Kong's economy is not seriously affected by the private sector's Y2K Problem, Audit has recommended that the Administration should:

— critically re-examine the Government's goals, role and responsibilities for helping the business community to manage the Y2K Problem (para. 208(a));

— perform a stock-take of its efforts to date and use the results to determine the best way forward (para. 208(b));

— consider strengthening regulatory control to ensure that providers of essential services are Y2K compliant in order to avoid major disruptions to the community (para. 208(d)); and

— consider establishing monitoring and reporting mechanisms to oversee the Y2K compliance programmes of providers of essential services, for example, health, transport and utilities (para. 208(f)).

I.   **Response from the Administration**. The Secretary for Information Technology and Broadcasting welcomes the audit report and appreciates its usefulness to the Y2K work of the Administration.   He has accepted most of the audit recommendations.   He has advised that the establishment in March 1998 of the Steering Committee on Year 2000 Compliance has enabled Y2K rectification work within the Government to be taken forward in a more coordinated manner.   It has also resulted in a more focused approach to promoting awareness and understanding of the Y2K Problem on a community-wide basis (para. 210).

PART 1 — INTRODUCTION

1.   This PART describes the background to the audit and outlines its objectives, scope and methodology.

The Year 2000 Problem

2.   At midnight on 31 December 1999, many date-dependent devices could fail causing widespread disruption across the world. While most people will be welcoming in the new millennium, many information technology (IT) professionals will be working to address major system failures across the global community.

3.   The practice of using a two digit year in computer systems has created what is known as the " Year 2000 Problem" (Y2K Problem) or the " Millennium Bug" . The Y2K Problem is not just a computer issue, but a business problem that could threaten the effective functioning of the global community in the next millennium.

> " The failure to get it right will affect the integrity of the payment system, financial markets, and the performance of the domestic and the global economies …." (Note 1)

4.   Information technology is the tool that will shape the twenty-first Century. As clocks tick towards 1 January 2000, the time remaining to ensure that systems are free from the Y2K Problem is rapidly disappearing.

5.   For more than three decades, computer programs have used only two digits rather than four to represent the year. This is because, when computer systems were being built in the 1960s and 1970s, computer memory was expensive and using only the last two digits to represent the year, with no " 19" in front, could save space. For instance, 1998 is represented as " 98" and most business applications represent the date in the form DDMMYY; 31 January 1998 is normally represented as " 310198" . No one anticipated the longevity of computer systems designed in the 1960s and 1970s. Therefore, no one ever expected to have to face the Y2K Problem.

6.   When internal clocks tick over to the year 2000, only " 00" will appear and many computers with time-sensitive functions or

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Note 1:   *Business Week 1997, President of the Federal Reserve Bank of New York.*

programs may assume that the year is 1900. As a result they could shut down, refuse to accept valid data, or produce errors that are not easily detectable, if they assume that "00" comes before "99". Others may revert to a different date, such as the date when the systems were initially programmed. The Y2K Problem is not just a date problem, 1 January 1900 was a Monday whereas 1 January 2000 will be a Saturday. Some computers may incorrectly assume that the first day of the next millennium is a weekday.

7.   Systems which calculate interest rates, mortgages, payroll and superannuation, determine use-by dates for perishable foods, and systems which produce invoices or purchase orders may all be susceptible to the Y2K Problem. Consider a system which calculates interest on a loan in year 2000. If the computer treats year 2000 as 1900, it will conclude that the loan taken out in 1998 is now 98 years old (00 – 98 = –98). If the minus sign is ignored, the system will record an enormous interest bill for the customer. If the computer recognises the minus sign, it will generate a large negative credit. Either way, errors will occur leading to a time-consuming correction exercise and a large number of complaints from customers.

8.   Correcting the Y2K Problem is not complex but may require a substantial amount of time to locate the large number of fields which contain dates. These are randomly located in masses of non-date related fields. Locating them may require a comprehensive search of an entire software library which may contain millions of lines of code.

9.   The Y2K Problem not only affects computers but all equipment and machinery using microprocessors (microchips). The problem arises because many microchips have a restricted capacity and the software and data stored usually use only two digits to specify the year. This date processing logic resides as a component of an array of equipment that we use on a daily basis such as security systems, communication equipment, heating and air-conditioning systems, and medical equipment.

10.   An additional problem is that the year 2000 is a leap year, whereas 1900 was not. Due to the complicated rules regarding the definition of a leap year, many programmers may have failed to define 2000 as a leap year. As a result, many computers may not recognise 29 February 2000 resulting in errors, rejected data or system failure. At midnight on 1 January 1997, 660 process control computers, which ran the smelter potlines at an aluminium smelter in New Zealand, could not account for an extra day stemming from the 1996 leap year and crashed. Five pot cells were ruined leaving the company with a repair bill equivalent to HK$2.5 million.

Possible consequences of non-compliance

11.   The British Standards Institution has developed a formal definition of Y2K compliance:

> "Year 2000 compliance shall mean that neither performance nor functionality is affected by dates prior to, during and after the year 2000. In particular:
>
> —   no value for current date will cause interruption in operation;
>
> —   date-based functionality must behave consistently for dates prior to, during and after year 2000;
>
> —   in all interfaces and data storage, the century in any date must be specified either explicitly or by unambiguous algorithms or inferencing rules; and
>
> —   year 2000 must be recognised as a leap year."

12.   The year 2000 is an immovable deadline and the consequences of non-compliance are potentially disastrous. In our daily lives, computers and microchip-embedded equipment control diverse and wide-ranging operations such as flying and navigation of aeroplanes, salary payments, and traffic lights. Insurers have warned that airlines worldwide will be grounded if they fail to protect their computers from the Y2K Problem. A large international insurance company has said that it will withdraw cover for any airline which does not adapt their systems before year 2000. Organisations cannot delay addressing this issue or risk possible system, or even business, failure. Although not all system failures will endanger our lives or result in business failures, they will cause considerable inconvenience.

13.   For some organisations in Hong Kong and overseas, the Y2K Problem has already emerged. Organisations that are required to enter year 2000 dates prior to the next millennium, for example credit card expiry dates, loan calculations and stock control of perishable goods, have already experienced problems with year 2000. In Hong Kong, the Government has also experienced the Y2K Problem. The Electrical and Mechanical Services Department (EMSD) noted in May 1997 that its Computerised Costing and Management Information System (CMIS) was affected when maintenance scheduling dates extended to dates beyond the year 2000. One manufacturer in the United Kingdom (UK) had to recall a heart defibrillator because its built-in safety feature would shut it down if it had not been serviced recently. It thought 2000 was 1900, and would therefore register that the machine had not been serviced for over 90 years.

14.   Government services and operations could be seriously affected if the Government does not take adequate steps to ensure that its critical systems are Y2K compliant. Some examples of risks to key government functions are:

  —   public safety being put at risk;

  —   government revenue not being received;

  —   business functions being disrupted, including the delivery of key services such as health care, emergency services, immigration controls, and postal services;

  —   delay in paying vendors and suppliers for goods and services provided to the Government; and

  —   delay in payment of salaries to government employees.

The role of the Government

15.   The Government functions for the well being of the whole community. The Government has a responsibility to ensure the continuity of essential public services such as health services, public transport and the provision of utilities.

16.   The Government also has a role to play in facilitating the competitiveness of Hong Kong in order for it to compete effectively with the rest of the business world:

> " To promote the well being of the people is the most fundamental task of a responsible government. In the increasingly open and competitive world market, all governments will have to maintain the economic vitality of the community as a whole to create rising prosperity …. My Administration … has to plan with specific focus on adding value to our economy, and seriously considering our ability to compete in the world market." (Note 2)

Note 2:   *Policy Address by the Chief Executive of the Hong Kong Special Administrative Region on 8 October 1997.*

17.   The Y2K Problem is a potential threat to both the business sector and the Government and, consequently, to the competitiveness of Hong Kong.   Failed systems, delays and errors on customer accounts will affect the efficiency and competitiveness of organisations.   Raising awareness of the issue would assist the community in recognising and overcoming this common, and foreseeable, threat.

18.   The correction of an organisation's own computers will not necessarily be enough if its customers and suppliers have not fixed their own problems.   They can seriously affect an organisation's business.   For example, an organisation's computers may be Y2K compliant but they will not work if the electricity supplier has failed to solve its problems by the deadline.   With complex supply chains and the increasing use of computers to exchange data between the private sector and the Government, it is important to ensure that government systems are protected from non-compliant private sector organisations.   No organisation, including the Government, operates in isolation:

> " Year 2000 isn't a computer problem ... it isn't a company, industry or U.S. problem either - it's a global interdependency problem." (Note 3)

Costs of achieving Y2K compliance

19.   A US-based research firm (Note 4) estimated that the worldwide cost to companies and governments to fix the Y2K Problem could be as high as US$600 billion (HK$4,700 billion).   Another international software research firm (Note 5) estimated that the software repairing cost for Hong Kong would be approximately HK$10 billion.

20.   Many organisations have not yet identified their costs for achieving Y2K compliance.   It is likely that as organisations firm up on the tasks required, and as IT skill's shortages lead to higher salaries, Y2K project costs could soar.

Note 3:   " *Welcome to 2001, see you in court" , Computerworld Hong Kong, 28 August 1997.*

Note 4:   *Gartner Group (source: " Year 2000 Date Problem Guidebook" published by the Hong Kong Productivity Council, August 1997).*

Note 5: *Software Productivity Research (source: " Year 2000 Date Problem Guidebook" published by the Hong Kong Productivity Council, August 1997).*

Audit review

Audit rationale

21.   The Y2K Problem represents a significant potential risk to the delivery of the Government's key services and operations. The day-to-day operations of the Government are highly computerised, with critical systems sometimes complex or integrated within government departments. Audit carried out a review to provide an independent check to ascertain whether the Administration is tackling this common threat adequately and effectively in a coordinated and timely manner.

22.   Audit has added value by bringing to the attention of the Administration issues where greater efforts may be required, and by prompting the Administration to expedite action to resolve the Y2K Problem. Audit designed a comprehensive questionnaire which could also serve as a self-assessment tool for government organisations to ensure that they have addressed all critical aspects of the Y2K Problem such as impact analysis, compilation of project plans and prioritisation of the conversion exercise.

Audit approach

23.   This audit set out to primarily assess government organisations' preparedness for the Y2K Problem and, to a lesser extent, the awareness of and preparedness for the problem in the private sector. Audit surveyed all policy bureaux and government departments' Y2K preparedness and their management of the problem, including risk management disciplines. In particular, Audit was concerned about the steps taken by government organisations to assess and address the Y2K-related risks to their business and key functions such as service delivery, revenue collection and public safety. With regard to the private sector, Audit was concerned about the steps taken by the Government to help the private sector to overcome the Y2K Problem.

Audit objectives

24.   The objectives of the audit were to:

—   reinforce awareness in the Government and the private sector of the Y2K Problem and the urgency with which compliance must be achieved;

—   review, and assess the adequacy of, government organisations' planning in relation to achieving Y2K compliance;

— review government organisations' strategic risk assessments in relation to the Y2K Problem;

— review, and assess the adequacy of, the implementation, management and monitoring of Y2K compliance strategies in government organisations; and

— ascertain the role of the Government and to assess the effectiveness of the Government's efforts in promoting awareness of the Y2K Problem in the private sector.

Audit scope

25.   The audit focused on the Government's awareness, planning and, to a lesser extent, the implementation of Y2K solutions at a strategic level.   It was not intended to address technical issues regarding the solutions adopted by policy bureaux and government departments to make their systems Y2K compliant.   This approach was considered necessary because this audit should not be perceived as providing a certification of individual government organisations' compliance.

Audit methodology

26.   Audit conducted a broad-based review of policy bureaux and government departments.   This involved the distribution, collection and analysis (on an unweighted basis) of questionnaires to 85 policy bureaux and government departments, as well as field visits to a number of large government organisations.   The analysis contained in this report is based upon 84 completed returns.   One policy bureau submitted two returns and another department submitted three returns.   Details are shown in Appendix A.

27.   To assess how effectively the Government has promoted an awareness of the Y2K Problem in the private sector, Audit issued questionnaires to 363 private sector organisations, covering small, medium and large enterprises.   These covered the majority of business sectors within the community.   Also included in the distribution of questionnaires were non-government organisations (NGOs), funded or regulated by the Government, which provided essential services to the public (Note 6).   The analysis contained in this report is based upon 175 completed returns (a response rate

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Note 6:   *Examples of these organisations are the Airport Authority, the Mass Transit Railway Corporation, the Kowloon-Canton Railway Corporation, the Kowloon Motor Bus Company Limited and the China Light and Power Company Limited.*

of 48%).

PART 2 —   AWARENESS AND RECOGNITION OF THE Y2K PROBLEM

28.   This PART examines the extent and the timing of awareness in the public sector in Hong Kong. It includes a review of actions taken, and the timing by the Government to raise awareness of the issue within government organisations.

Background

29.   Many people may have heard of the term " Y2K Problem" or " Millennium Bug" but may not fully understand what it is and how it could affect them. Despite the considerable amount of publicity on the Y2K Problem over the last few years, many organisations and senior managers may ignore or may not have a good understanding of the nature or size of the problem. Senior managers will be held responsible if non-compliant software and hardware cause major disruption to an organisation's operations.

Y2K misconceptions

30.   There are a number of common misconceptions surrounding the Y2K Problem. If senior management, staff or customers adopt any of the following views, an organisation may be at risk:

   (a) ***There is plenty of time remaining to fix the problem.*** Evidence to date indicates that organisations which have already started to address the problem may have underestimated the time required to identify and convert the many lines of code containing date fields. Also, many organisations may need to input year 2000 dates before 1 January 2000, for example maintenance scheduling or expiry dates on licences. As a result, the problem may have to be fixed several years earlier than anticipated;

   (b) ***The problem is easy to fix.*** This may be true for an organisation which only has a small number of systems and programs but the problem is that many organisations have hundreds or thousands of them;

(c) ***We can review system documentation for location of date codes***. Legacy systems' (Note 7) documentation may be difficult to find, or out of date, making it difficult to understand its design and interfaces and to locate affected codes. This was a problem experienced by a local university during its conversion process when poorly documented programming and the absence of the software's original developers hindered the date-detection task;

(d) ***The problem should not be so bad because we have only bought packaged software in the last few years.*** Many of the packages in use today were originally designed a decade or more ago when two digits were used to specify the year. Over the years, in-house amendments have been made to modify the software (for example, tailor-made program interfaces to other systems). However, the original core, including the two digit dates, has been retained. Therefore, the Y2K Problem still exists. A large computer vendor said that there was a " good chance" that some products produced by his company and shipped prior to 1 May 1997 might not be year 2000 compliant;

(e) ***We have the resources to handle the conversion process in-house***. A survey carried out in the United States by a consultancy firm, which specialises in year 2000 code correction work, found that 82% of companies surveyed which had begun rectification underestimated the amount of time and money that would be needed for the project. More than 70% of the companies had been forced to increase their staff;

(f) ***The responsibility can be outsourced.*** Many organisations may be planning to outsource their Y2K project. There have already been predictions that this will lead to IT resource shortages and soaring costs. Managers must realise that they can outsource the conversion process but not the responsibility for achieving compliance; and

(g) ***We can just replace the systems by year 2000.*** Major systems replacements may take even longer to install than fixing the old system. If there are any problems it may then be too late to convert the old existing system.

Note 7: *Legacy systems are old computer systems that have been in use for some 20 to 30 years. They were written in old programming languages.*

Addressing the Y2K Problem

31.   The challenge in overcoming the Y2K Problem should be addressed, not as a technical problem, but managerially. Senior management support and involvement are essential to ensure that business risks are identified, sufficient resources are allocated to the Y2K project and the issue is addressed in a structured and effective manner. An environment should be created in which a Y2K project can flourish, including communication of the issue to all employees. For an organisation that takes the issue seriously, one would expect to see reference to the Y2K Problem in policy statements or business plans.

32.   The Y2K project is likely to be the largest and most significant technology-based project most organisations will undertake. The Y2K bug can affect all types of hardware, software and microchip-embedded equipment. An organisation should also be aware of the risk from non-compliant external parties such as customers and suppliers.

33.   Many organisations will be affected by the Y2K Problem prior to 1 January 2000. The date when the Y2K Problem will impact must be identified and this information used to determine the priority with which potential problems will be addressed. It is also important for organisations to recognise year 2000 as a leap year and to ensure that their systems recognise 29 February 2000.

The Y2K programme

34.   Addressing the Y2K Problem requires government organisations to apply a whole-of-business focus, rigorous risk management and sound project management. Based on recognised industry guidelines, Audit has categorised the phases of the Y2K programme, as follows:

- Awareness

- Assessment and planning, in which systems are identified and prioritised for repair or replacement

- Conversion, in which affected systems are repaired or replaced

- Testing and implementation of converted systems

35.   Figure 1 below illustrates the timetable that Audit would expect organisations to be actively working towards. This timetable is based on recognised industry guidelines.

Figure 1

Y2K Programme Timetable
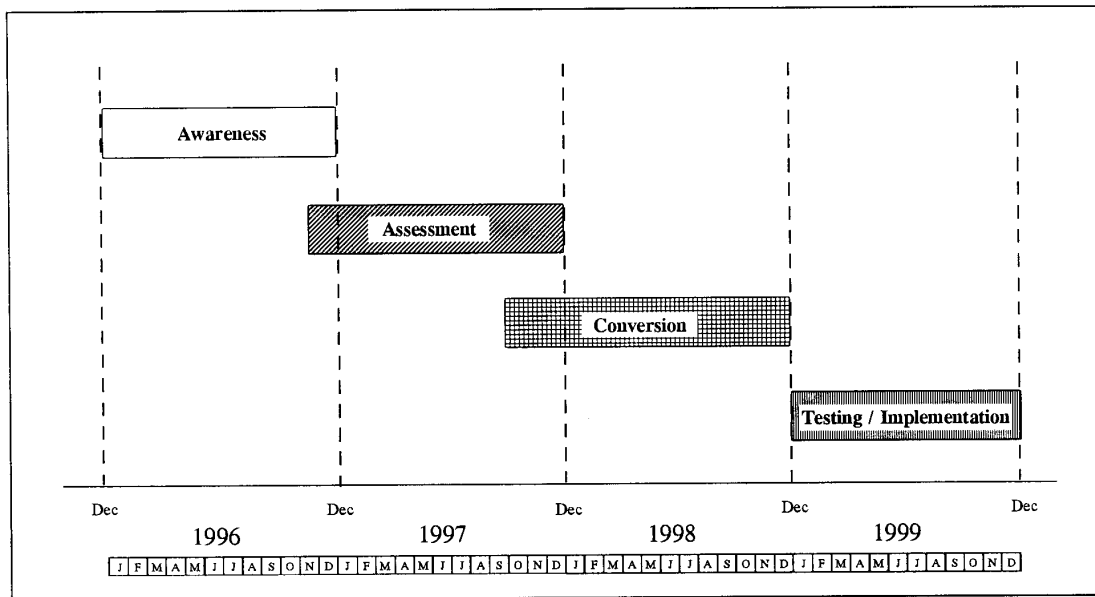
Source: Audit Commission

36.   Awareness of the Y2K Problem is the crucial first step towards achieving compliance. The key stages in the awareness phase are as follows:

- Define how the problem impacts on the organisation and its operations

- Conduct an awareness campaign within the organisation for senior managers and staff

- Develop a Y2K strategy that includes key year 2000 issues, including project management structure, reporting requirements and initial resource estimates

- Convince senior management that the problem exists and obtain their support

- Establish a senior management group with responsibility for overall control and coordination of the project

- Establish a Y2K project team and project manager with senior management involvement or regular reporting to management

37.   The timing of the awareness phase is also critical to the success of a Y2K project. To achieve compliance by year 2000, it is suggested that an organisation should have completed an awareness campaign by the end of 1996 (Note 8). Indeed, in a memorandum to the Director of Information Technology Services dated 31 March 1998, the Judiciary Administrator stated that:

" With the benefit of hindsight, I consider that the Y2K awareness should start in early 1997 at the latest, giving departments some time to figure out the totality and seriousness of the problem."

Awareness and recognition of the problem by the Government

38.   The Government classifies computer systems as either administrative or non-administrative. Broadly speaking, administrative systems provide decision-making support to

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Note 8:   *Year 2000 Computing Crisis: An Assessment Guide, United States General Accounting Office, September 1997.*

management and assist in performing the administrative and operational duties in departments (Note 9). Non-administrative systems use computers to support professional, technical and educational disciplines in performing non-administrative tasks (Note 10). The Y2K Problem not only affects the Government's administrative computer systems, but also affects non-administrative systems and equipment with embedded microchips. Government organisations must realise the full extent of the problem and assess all types of systems and equipment that could be affected.

39. The Information Technology Services Department (ITSD) is responsible for the development, implementation and maintenance of the Government's administrative computer systems. It also provides advisory services and common IT facilities for government departments and helps them acquire standard computer hardware, software and related services. The ITSD has taken an active coordinating role to tackle the Y2K Problem in respect of the administrative computer systems in the Government.

40. Promotion of awareness among government organisations began in late 1996 through an ITSD exhibition in November 1996, which included Y2K awareness as one of its seven topics. As attendance at the exhibition was voluntary, it could be inferred that not all senior managers were aware of the issue by the end of 1996.

41. The Year 2000 Compliance Programme Management Group (YPMG) (Note 11) was set up within the ITSD to oversee the Y2K work on systems that were supplied by the Department or through its contractors. Its remit also includes a responsibility to raise awareness. The first meeting of the YPMG was held on 10 March 1997, with the Group meeting once a month to review progress.

42. In May 1997, six months after the ITSD exhibition, the ITSD issued a circular to Policy Secretaries and Heads of Departments

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Note 9: *Administrative systems use computers for the collection, processing, utilisation, storage and distribution of information in order to provide decision support to management and to assist in performing the administrative and operational duties of departments.*

Note 10: *Non-administrative systems can be categorised into sensor-based systems, computer-aided design and computer-aided manufacturing systems, educational computing and technical and scientific computing.*

Note 11: *The YPMG, chaired by the Director of Information Technology Services, includes Branch Heads and the Y2K technical project team of the ITSD.*

containing background information on the Y2K Problem and the proposed actions on the part of the ITSD and users. This was followed by a series of circulars in September and December 1997 and March 1998 and a letter to all Policy Secretaries and Heads of Departments on 30 September 1997.

43. On 26 November 1997, the ITSD issued a letter to all Policy Secretaries and Heads of Departments requesting them to complete a survey detailing their plans for rectification of all types of computer systems. Respondents were asked to complete the survey by December 1997 for all administrative, non-administrative and end-user developed systems, and personal computers (PCs). The survey did not specifically mention equipment with date-sensitive elements such as medical equipment, elevator control systems and telephone systems.

44. The results of the survey indicated that of the 665 administrative systems identified, 356 (53.5%) required remedial work to ensure compliance. For the 195 non-administrative systems identified, 80 (41%) required remedial work, and for 38 systems (19.5%), the status of compliance had not yet been established. For the 699 end-user developed systems, 392 (56%) were assessed as non-compliant. The ITSD's preliminary observations in its report to the Computer Strategy Group (CSG) (Note 12) meeting on 9 January 1998 stated that:

— the ITSD had no information on hand to assess the size of the problem for non-administrative systems in the Government or how well equipped government departments were to handle it. The result of the quarterly survey seemed to suggest that the number was much smaller than administrative systems, so was the size of the problem. **" However, it could also reflect a gross understatement of the situation due to a general lack of sufficient knowledge."** ; and

— the ITSD did not have the technical expertise to advise government departments on how to identify such elements, to ascertain Y2K compliance, or to take the necessary action. No department had published guidelines to address the Y2K Problem on non-administrative systems.

Note 12: *The CSG, chaired by a Deputy Secretary for the Treasury and comprising officers of the Finance Bureau, the ITSD and the Efficiency Unit, is tasked to formulate service-wide IT policies and strategies, prioritise computerisation projects for funding purposes and monitor the overall IT expenditure of the Government.*

45.   The CSG:

—   shared the ITSD's concern that the reportedly small number of non-administrative systems confirmed to be non-compliant might be an under-statement of the size of the problem;

—   urged the ITSD to liaise closely with the EMSD and Office of Telecommunications Authority (OFTA) on electrical/mechanical systems and telecommunications instruments which formed the majority of the non-administrative systems in order to size up the problem and to solicit their assistance on what more could be done to promote departments' awareness of the Y2K Problem;

—   suggested that the ITSD should issue to departments a circular/letter on non-administrative systems, with more readily understandable examples of what systems should be classified as non-administrative, to enhance their awareness on the potential implications of the Y2K Problem and to publicise the assistance available to them; and

—   noted that the Director of Information Technology Services would raise the issue with the Director of Electrical and Mechanical Services and the Director-General of Telecommunications and would also liaise with other departments.

46.   Following their first meeting on 26 January 1998, the Director of Information Technology Services issued a memorandum to the Director-General of Telecommunications and the Director of Electrical and Mechanical Services on 20 February 1998 saying that:

" We agreed at our last meeting that there is a need to assist bureaux and departments in identifying and assessing the Y2K compliance status of non-administrative systems … as well as instruments and equipment that contain date-sensitive elements. We also agreed that information circulars from the EMSD and OFTA would be useful. The circulars could provide guidelines to bureaux and departments, supported by examples to illustrate how they can identify such systems and equipment."

47.   In his memorandum of 3 March 1998, the Director-General of

Telecommunications requested policy bureaux and government departments to verify details of the line communication equipment under their control. This would enable OFTA to secure the necessary funding and liaise with the contractors with a view to solving the Y2K Problem.

48.   On 6 March 1998, the Director of Electrical and Mechanical Services issued a circular to all Policy Secretaries and Heads of Departments on sensor-based non-administrative computer systems and microprocessor-based equipment.   The circular recommended departments to carry out inspections and simulated tests on such equipment in order to identify the Y2K Problem and to assess its impact on their operations. An enclosed appendix gave a list of typical systems that could be affected.

49.   As part of the ITSD's effort to assist policy bureaux and government departments in planning their year 2000 rectification projects, a workshop specifically aimed at Directorate staff was held on 31 March 1998. The objective was to provide a comprehensive framework and methodologies for bureaux and departments to follow in order to expedite the implementation of their Y2K projects. The content of the workshop also included coverage of the awareness phase of a Y2K programme, including impact on the business, IT and non-IT systems/equipment, steering committees and awareness campaigns.

Establishment of the Information Technology and Broadcasting Bureau

50.   The Information Technology and Broadcasting Bureau (ITBB) was established on 9 April 1998 and its responsibilities include policy matters relating to information technology and telecommunications. The ITBB has taken the lead in coordinating the Government's approach on the Y2K Problem. Prior to the establishment of the ITBB, the designated Secretary for Information Technology and Broadcasting established a Steering Committee on Year 2000 Compliance (Note 13) to monitor progress and to give an overall lead on Y2K issues within the Government and the NGOs. The Steering Committee also has responsibility for the promotion of awareness of the problem in the community. The first meeting was held on 31 March 1998.

Note 13:   *Membership comprises the Secretary and Deputy Secretary for Information Technology and Broadcasting; Principal Assistant Secretary for Information Technology and Broadcasting; Director of Information Technology Services; Director of Electrical and Mechanical Services; Director-General of Telecommunications and representatives from other policy bureaux.*

Audit observations on the Government's Y2K awareness

51.   Through a series of circulars and letters (see paragraphs 42 and 43 above), the ITSD attempted to raise the awareness of the year 2000 issue among government organisations. However, survey results and discussions at the CSG meeting (see paragraphs 44 and 45 above) indicated that, as late as March 1998, there was still uncertainty within government organisations concerning the Y2K Problem affecting non-administrative computer systems and equipment with embedded date-sensitive elements.

52.   It was not until late January 1998 that the ITSD, OFTA and the EMSD met to take a coordinated approach to the Y2K Problem (see paragraph 46 above). Two months later, the Steering Committee on Year 2000 Compliance met for the first time (see paragraph 50 above). With this delay in introducing a coordinated approach, and the absence of expertise in all aspects of the Y2K Problem, by as late as March 1998, government organisations might not have been fully aware of the extent of the problem.

53.   Delays in issuing guidance on equipment with date-sensitive elements may have impacted on an organisation's ability to fully assess the potential effects on its operations and draw up an effective plan of action in time to address these impacts. Comprehensive impact assessments of all relevant assets may only have begun in March 1998. Any delays in the awareness phase will affect the successful completion of the subsequent project phases and, ultimately, may result in system and equipment failures in year 2000.

54.   An ITSD circular, dated 6 March 1998, requested policy bureaux and government departments to compile a second quarterly survey on their progress in identifying and rectifying the Y2K Problem on all types of systems and equipment as at 31 March 1998. The previous survey in November 1997 (see paragraph 43 above) had requested details for **" computer systems"** whereas the latest circular expanded the categories to include **" ALL government assets that will be affected by the Year 2000 Problem"** . It specifically mentioned sensor-based computers and microprocessor systems that are embedded in electrical, mechanical, electronic and medical equipment; and line communication systems (i.e. telephone systems).

55.   **Audit welcomes this clarified and expanded definition of assets that may be affected by the Y2K Problem. The ITSD's primary focus had initially been on the identification of administrative systems, end-user developed systems and PCs and their impact on government operations. The original emphasis on computer systems, rather than on all assets that may be affected, may have jeopardised government departments' ability to draw up an effective plan of**

action in time to meet the threat of Y2K and its immovable deadline.

56.   The ITSD-sponsored workshop (see paragraph 49 above) may have helped senior managers of government organisations to understand and address their Y2K problems. However, the delay in holding such an event is further evidence of a lack of awareness at a sufficiently early date by the Government. An awareness seminar for senior civil servants was held in the UK in March 1996, two years before the similar workshop in Hong Kong.

Analysis of responses to Audit's questionnaire

57.   In order to gauge the level of awareness of the problem in the public sector, Audit conducted a survey of policy bureaux and government departments through a detailed questionnaire during January 1998.   The analysis is based upon 84 returns (see paragraph 26 above).

58.   The survey results indicate that, with 74 (88%) government organisations affected, the Y2K Problem represents a significant risk to the Administration. The ten government organisations which have stated that they are not affected by the Y2K Problem are listed in Appendix B. To gauge their awareness of the implications of the problem, Audit asked respondents whether they had addressed the key stages of the awareness phase as detailed in paragraph 36 above.

Impact assessment

59.   **Of the 74 government organisations which are affected, 31 (42%) had completed an assessment of how the Y2K Problem impacts on their organisation. Forty (54%) were still in the process of completing their impact assessments as at 31 January 1998 and three (4%) had yet to start the task.**

60.   The response suggests that a significant number of government organisations are behind schedule in respect of their Y2K programmes. Without assessing the potential impacts of Y2K on business operations, an organisation will be unable to proceed to plan their approach to solving the Y2K Problem. Any delays in this initial stage will impact on their ability to successfully address the issue by the deadline.

Awareness campaign

61.   An awareness campaign is a crucial first step to raise the

awareness of both senior managers and staff about the potential impact of Y2K on an organisation's operations. Only 36 (49%) respondents had conducted an awareness campaign within their organisation, despite the fact that 52 (70%) claimed to be at risk of their employees being unable to perform their duties because of year 2000.

Management

62.   Management commitment and involvement are essential to ensure that the Y2K Problem is addressed effectively. Audit asked whether there was senior management involvement in a steering committee or project team responsible for Y2K matters. Forty-two per cent of respondents did not have senior management involvement and did not submit regular progress reports to senior managers. The Y2K Problem is a business, not a technical issue, and it is essential that senior management are kept aware of developments in an organisation's Y2K project. Senior managers have a responsibility to ensure that operations are not disrupted and should therefore play an active role in ensuring that any Y2K risks are addressed effectively.

63.   It is essential that organisations appoint a project manager and establish a project team to manage and coordinate the Y2K project activities. Fifty-three (72%) respondents had established a project team. Of those with project teams, 18 (34%) had not drawn up formally defined roles for those individuals responsible for resolving the Y2K Problem. Only 30 (41%) respondents had appointed a project manager.

External parties

64.   With complex supply chains and the increasing use of computers to exchange data, it is important for government organisations to identify external parties, the failure of whose systems would expose the organisation to unacceptable risk. To avoid disruption to their key services and operations, assurances should be sought from critical external parties, such as utilities and banks that they are compliant and will not disrupt the organisation's operations. Contingency plans to deal with possible external party non-compliance should be prepared.

65.   Respondents were asked whether the Y2K Problem presented a risk of their operations being impacted by another organisation. Although 52 (70%) respondents stated that this was a risk, only 2 (3%) had included plans to address this risk in their contingency plans. To ensure that the continuity of their business is protected against non-compliant external parties, it is vital that organisations are aware of external party threats and consider how they will address this risk.

Other issues

66.   The analysis of the survey results showed that 28 (38%)

respondents had not considered the leap year issue as part of their Y2K programme. If the leap year issue is not addressed, some computers may not recognise 29 February 2000 resulting in errors, rejected data or system failure.

67. Audit asked respondents whether they had considered the issue of year 2000 dates which might need to be input prior to 1 January 2000. Seventeen (23%) had not considered this issue. System failure can occur at any time between now and 1 January 2000. Organisations must address this issue as soon as possible or risk disruption to their operations in the near future.

Audit conclusions on the Government's Y2K awareness

68. Since May 1997, the ITSD, on behalf of the Administration, has attempted to raise the awareness of the Y2K Problem among government organisations through a series of circulars and letters. Unfortunately, Audit's survey results suggest that a significant percentage of respondents were not fully aware of the Y2K Problem, and may not be managing and coordinating their Y2K projects effectively. As late as March 1998, there was still uncertainty within government organisations as to the nature and extent of the Y2K Problem, especially on equipment with date-sensitive elements.

69. **Initially, there was no coordinated whole-of-government approach to the Y2K Problem. Without such an approach, government organisations may not have a clear understanding of the full implications and may therefore be at risk. Any delays in the awareness phase will affect the successful completion of the subsequent project phases and, ultimately, may result in system failures in year 2000.**

70. As at 31 March 1998, all but four of the policy bureaux and government departments had submitted their returns. These are set out in Appendix C. Considering the high percentage of returns, and the comprehensive nature of Audit's questionnaire, it is reasonable to assume that there is now a high level of awareness within policy bureaux and government departments. Audit's questionnaire has directed government organisations' attention to those areas connected with awareness such as impact assessment, risks to the business and management of the project. In a memorandum to the Director of Information Technology Services, dated 31 March 1998, the Judiciary Administrator said that:

> " After we have received Director of Audit's memo on
> 24 December 1997, I began to realise the width and depth
> of the problem."

71.   After using Audit's comprehensive questionnaire, government organisations should then be in a much better position to refine and complete their awareness campaigns. This will allow them to focus on the other critical phases of the Y2K programme.

72.   Late awareness of the extent of the problem could affect an organisation's progress towards achieving Y2K compliance by delaying the assessment and conversion phases of the programme. The progress in the assessment and conversion phases (see paragraph 35 above) is discussed in PARTS 3 and 4 below.

Audit recommendations on the Government's Y2K awareness

73.   **Audit has *recommended* that the Administration should:**

- — **ensure that the ITBB continues to take a pivotal role in managing the whole-of-government Y2K Problem;**

- — **continue to actively promote Y2K awareness, including the latest Y2K information, through circulars and e-mail;**

- — **provide urgent assistance to those government organisations that are still in the process of completing the awareness phase of their programme; and**

- — **obtain Y2K compliance assurance from essential service providers, for example telecommunications and electricity, to ensure continuity of service for the whole Government.**

74.   **Audit has also *recommended* that policy bureaux and government departments should:**

- — **continue to use Audit's questionnaire as a practical guide to assist them in raising awareness of the scope of the problem within their organisations; and**

- — **ensure that senior managers receive regular progress reports on their Y2K projects.**

PART 3 — SLOW RATE OF PROGRESS IN GOVERNMENT ORGANISATIONS

75.   This PART outlines the Administration's progress towards the resolution of the Y2K Problem. It discusses a number of key issues that the Administration should have considered in addressing the problem.

Background

76.   The Y2K Problem is a business survival issue and, as such, requires the application of rigorous project management disciplines. Sound project management requires well-defined plans encompassing a clear definition of objectives, roles and responsibilities; assessment of risks; and estimated resource requirements. Supervision and regular monitoring are essential to ensure that the project is progressing on time and within budget.

77.   The assessment phase is a crucial aspect of an organisation's Y2K project. It is during this phase that organisations establish what must be done and the timeframe for completion. They must assess the Y2K risks to the business, identify resources and begin to put into place the strategies and framework that will direct their Y2K project to completion.

78.   The key stages in the assessment phase of the Y2K programme are as follows:

- Assess the severity of impacts on business operations from Y2K failures

- Compile an inventory of computerised systems and equipment

- Prioritise systems and equipment to be repaired or replaced

- Draw up a Y2K project plan

- Identify and secure resources

- Develop and document test and validation plans for Y2K compliance

- Address interface and data exchange issues

- Develop contingency plans

79.   There are a number of phased timetables that are recommended by national audit offices. The United States General Accounting Office (USGAO) states that the assessment, analysis and planning phase of a Y2K project should be completed by Autumn 1997 (Note 14). To ensure that all information systems can cope with the millennium, the UK National Audit Office reports that organisations should have audited (assessed) all systems for compliance by January 1997 and have a programme of action in place by October 1997 (Note 15).

80.   A recognised industry expert on the Y2K Problem stated that, at the very least, organisations should have a detailed Y2K project plan in place as of 1997.

81.   Industry estimates indicate that organisations may need over a year to adequately test and validate converted systems for Y2K compliance. Testing and validation could consume up to half of an organisation's project resources and budget. It is therefore essential to conduct the assessment phase within the timetable to ensure that it does not adversely affect the subsequent phases.

Note 14: *Year 2000 Computing Crisis: An Assessment Guide, USGAO, September 1997.*

Note 15: *Report by the Comptroller and Auditor General, UK National Audit Office, May 1997.*

82.   By 31 January 1998, Audit would expect government
organisations to have identified the risks arising from Y2K;
assessed the impact of potential system failure on their business
operations and mission-critical processes; and developed a timed,
costed and prioritised project plan.   By this date, organisations
should also have started the conversion phase of the Y2K programme.

Impact assessment

83.   Audit asked respondents whether they had conducted an
examination of the impacts of Y2K on their operations.   For the
31 (42%) respondents who had completed an impact assessment (see
paragraph 59 above), Audit's analysis shows that these assessments
were not comprehensive and that they excluded a number of important
aspects such as impacts on service delivery or their staff's ability
to perform their duties. Details are shown in Figure 2 below.

Figure 2

**Percentage of respondents whose assessments
had excluded important aspects of Y2K impacts on their operations**
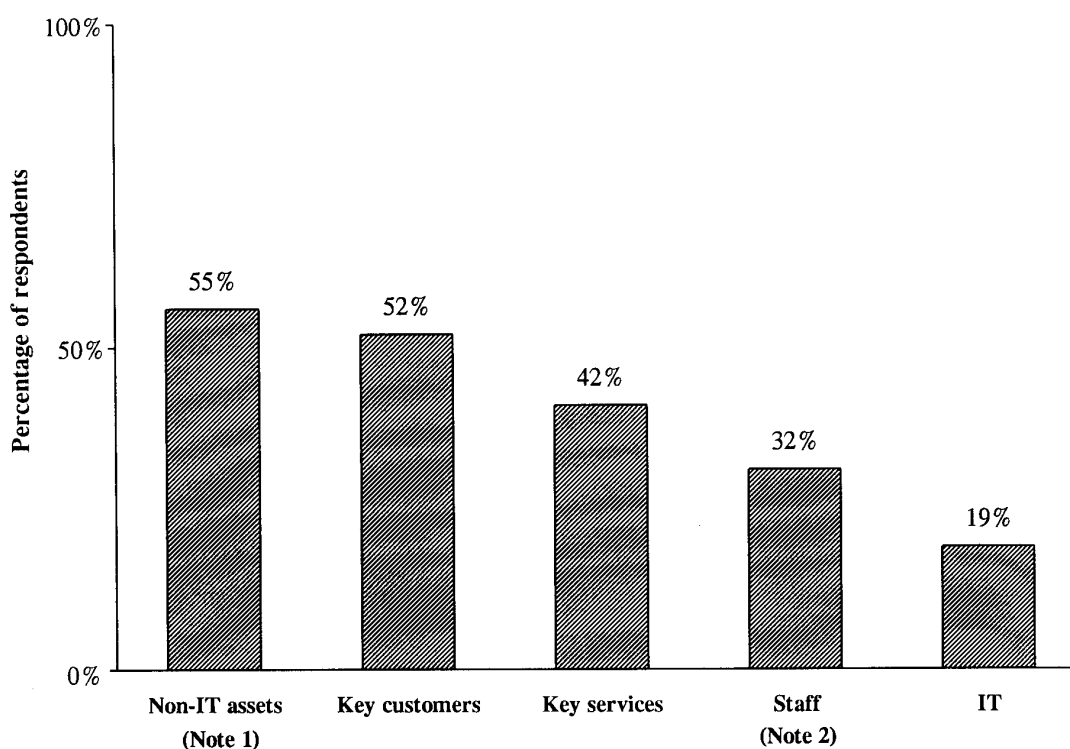
Source: *Audit's survey in January 1998*

Note 1: *Non-IT assets refer to machinery and other equipment with embedded date-sensitive elements.*

Note 2: *"Staff" refers to their ability to perform their duties.*

84.   These results indicate that a significant number of government organisations did not fully appreciate the potential scope of the impact of year 2000.   The failure to carry out a comprehensive impact assessment may leave some key areas of business exposed to the risks from Y2K-induced failures.

85.   The analysis of the 40 (54%) respondents who were still in
the process of completing their impact assessments (see paragraph 59
above) shows that a significant proportion had still to assess a
number of important aspects. Details are shown in Figure 3 below.

Figure 3

**Percentage of respondents who had still
to assess important aspects of Y2K impacts on their operations**
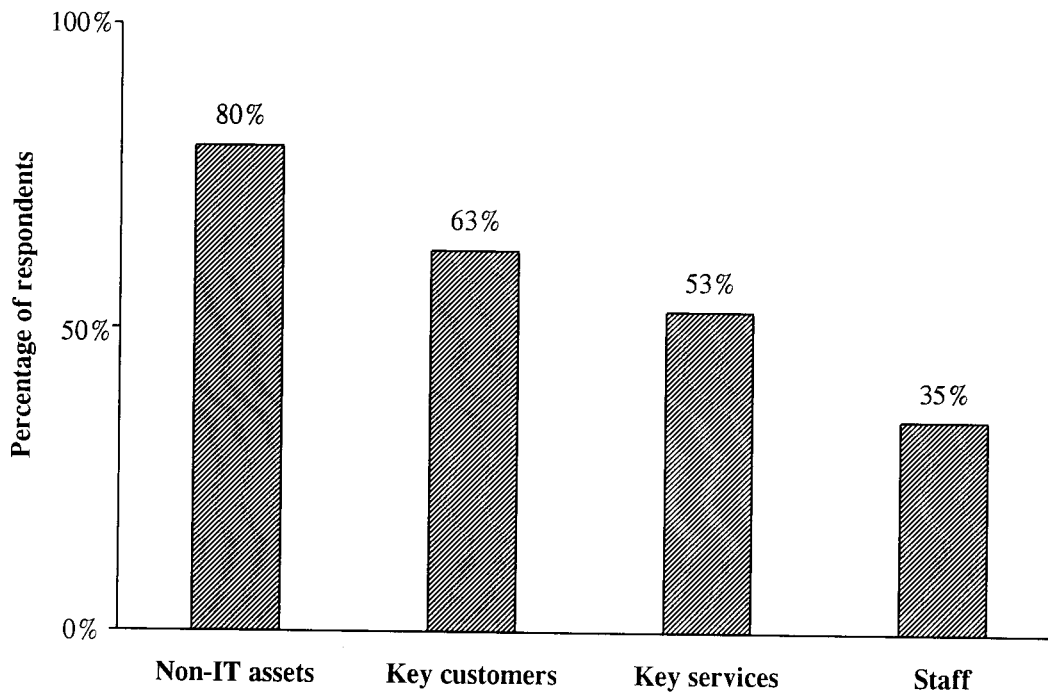
Source: Audit's survey in January 1998

86.   Overall, the results show that government organisations are
behind schedule, with a significant number of organisations which
had still to complete their impact assessments as at the end of
January 1998. For those which had completed this task, the analysis
shows that they failed to address a number of critical issues that
may impact on their business operations. **The results of Audit's
survey clearly indicate that there is still a significant amount of
work to be carried out in this initial assessment phase of the Y2K
programme.**

87.   It was not until March 1998 that the EMSD and OFTA issued
year 2000 guidance to all bureaux and departments on instruments and
equipment that contain date-sensitive elements (see paragraphs 47
and 48 above). The ITSD only issued an expanded clarification on
the definition of non-administrative systems to bureaux and
departments in the same month (see paragraph 54 above). The delay
in alerting government organisations to this element of the Y2K
Problem may have been a factor in organisations' poor impact
assessments.

88.   Government organisations have not received sufficiently clear
and detailed guidance from the ITSD or any other government
department detailing how to carry out an impact assessment. Without
this guidance, many respondents remain unclear as to how to address
this important step in the process. In addition, government
organisations have not received guidance on the crucial aspect of
the timing of their Y2K programmes. There is a considerable amount
of literature available that emphasises the criticality of timing to
the successful achievement of Y2K compliance.

Planning

89.   A project methodology highlights where efforts need to be
concentrated and where efforts can be minimised. The Y2K Problem
has the following unique and important elements which make it
essential that organisations draw up a plan to manage their project:

- The immovable deadline

- The need to manage complex interfaces and application coordination that will arise as individual systems are made compliant

- Little or no scope for error in changes that are made

- The need to maintain close integration with other organisations in respect of interfaces

90.   In their project plans, Audit would expect government organisations to have examined and documented the following:

- An assessment of business and technical risks

- A prioritised list of systems to be repaired or replaced

- An evaluation of options available to resolve the Y2K Problem

- Clear and specific milestones for all tasks

- Procedures for testing and documenting compliance

- Resources required for the project

91.   Only 32 (43%) respondents had drawn up a project plan. Of those respondents who had a project plan, only 14 were able to supply Audit with a copy. A further 20 respondents aim to prepare their project plans during the period from February to October 1998. This leaves 22 government organisations with no plans to prepare a project plan.

92.   With regard to those organisations who had prepared a project plan, Audit's analysis of their responses shows that the plans were not comprehensive and lacked essential elements. For example:

    —   16 (50%) had not included business and technical risks;

—   10 (31%) had not included procedures for testing and documenting compliance; and

—   5 (16%) had not included a prioritised list of the systems to be converted or replaced.

93.   The analysis shows that, due to their failure to develop well-defined plans, the majority of government organisations had not adopted a sound project management approach.

94.   Evidence from questionnaires, and telephone enquiries received by Audit during the survey, indicate that many respondents were uncertain as to how to prepare a project plan. A review of those project plans submitted to Audit revealed that several were not comprehensive and lacked crucial elements. These results may be a reflection of inadequate guidance given to government organisations at the early stage of their Y2K programmes.

95.   The ITSD-sponsored Year 2000 workshop on 31 March 1998 (see paragraph 49 above) included a section on how to set up a Y2K project. The following day's workshop had a slightly more in-depth treatment for the benefit of officers who were likely to be the Y2K project managers. Consultation sessions in early May 1998 aimed to provide consultancy services to address the needs, questions and issues encountered during the planning of the Y2K project. The UK Government held a similar workshop in September 1996, prior to the commencement of the UK government departments' Y2K projects, and 18 months before Hong Kong.

96.   Early guidance issued prior to 1998 may have avoided the situation whereby 57% of government organisations had not prepared a project plan as late as 31 January 1998.

Inventory

97.   A detailed inventory of information systems and non-IT assets is a basis for establishing the nature and extent of the Y2K project. Its completion is essential. Respondents were asked whether they had compiled an inventory of their IT applications, software and hardware. Although 64 (86%) respondents stated that they had compiled an inventory, a significant proportion had not addressed all elements of their IT and non-IT systems. Several deficiencies were noted. These are shown in Figure 4 below.

Figure 4

**Percentage of respondents who had not
addressed elements of their IT systems in their Inventory**
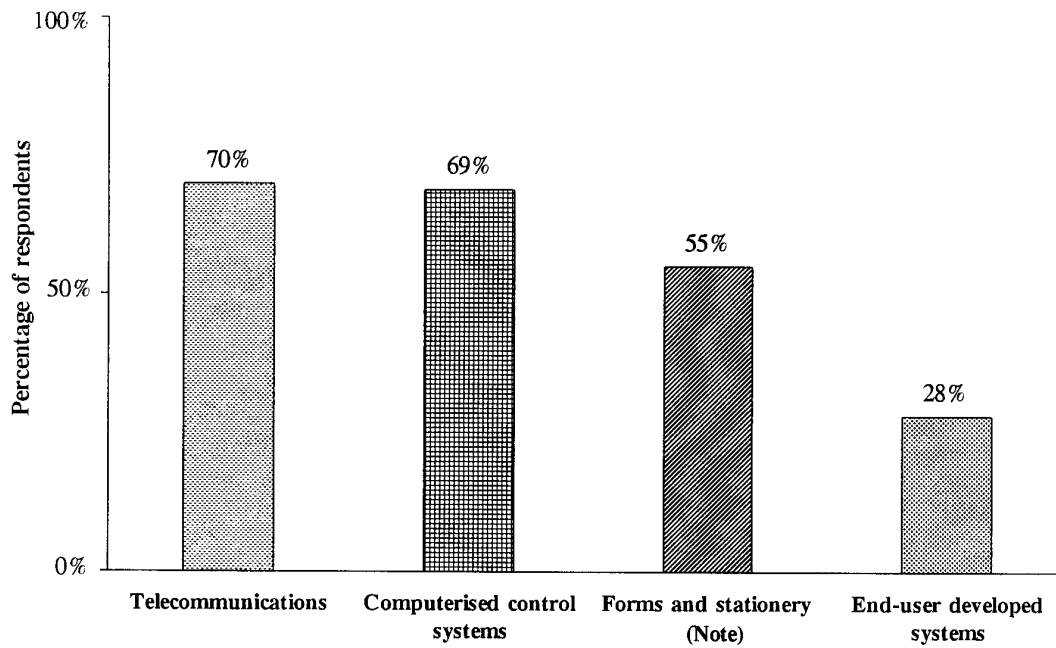
Note: These refer to forms and stationery which have dates entered automatically by
the computer system, for example cheques and demand notes.

98.   Audit also asked respondents whether they had compiled an inventory of non-IT assets (i.e. machinery and other equipment with embedded date-sensitive elements). Fifty-four (73%) respondents had not prepared an inventory of equipment that can potentially be affected by the Y2K Problem.

99.   The failure to identify systems and equipment that could be impacted by the Y2K Problem may ultimately affect the continuity of key business processes. Without a complete and accurate inventory of systems and equipment, an organisation will be unable to effectively prioritise its conversion process and prepare comprehensive contingency plans.

100.   It was only in November 1997 that the ITSD requested government organisations to identify their systems, ten months behind the recommended industry timeframe (see Figure 1 in paragraph 35 above). The lateness of the ITSD's stock-take of systems may also be a factor for the delay by government organisations in compiling a complete inventory of their systems. Furthermore, the ITSD's request for a detailed list of systems did not require organisations to identify priorities for the conversion of non-compliant systems.

Evaluation of options and prioritisation

101.   Organisations should determine the options and priorities for dealing with non-compliant systems immediately after the initial inventory. Key factors such as business impacts, anticipated failure date and whether systems can be fixed or replaced should be taken into account when establishing options and priorities. There may be insufficient resources or time available to repair or replace all information systems and equipment. Therefore, organisations should identify systems whose conversion can be deferred to a later date. When prioritising, it is also important to consider interfaces between systems.

102.   Audit's survey results indicate that, of those who had a project plan, 16% had not included a prioritised list of systems to be repaired or replaced. Nineteen per cent had not documented the options available to resolve the problem.

103.   Part of the prioritisation process should include an assessment of whether other technology-based projects can be deferred or cancelled due to Y2K remedial work. Audit's review of a sample of government organisations revealed that a number of government organisations, for example, Immigration and Inland

45

Revenue Departments, had deferred other less critical IT projects in order to concentrate their resources on Y2K projects. Audit appreciates the need for this

prioritisation and deferral of such IT projects to a later date to enable the organisations to concentrate their resources on solving the Y2K Problem.

Resources for Y2K rectification

104.   There are already indications that there will be a shortage of external IT resources throughout the world, particularly IT professionals who are familiar with traditional programming languages such as COBOL. This problem is also expected to affect Hong Kong:

> " In the first quarter of next year (1998), you will see organisations flock to look for Y2K services. By then, resources will be scant in supply as many service providers will have already committed their resources to their customers. Owing to the shortages of experienced expertise, the cost will soar." (Note 16)

105.   Indeed, the ITSD warned government organisations in September 1997 that they should make arrangements to secure the necessary resources for corrective work because " as the immovable deadline approaches …. the chances of a run on the IT product/service market are likely to be higher."

106.   As at 31 March 1998, only nine government Y2K projects had received funding approval. Although some organisations may be meeting their Y2K costs from their departmental estimates, there are still a number of government organisations which have still to receive funding approval for significant Y2K projects (for example, the EMSD, OFTA, the Census and Statistics Department and the Education Department). Delays in receiving funding approvals may be indicative of a delay in assessing how the problem impacts on their organisation and how they aim to address these problems. Delays may also hinder the execution of their conversion process.

107.   Respondents were asked whether they expected to have sufficient in-house IT staff to accomplish Y2K compliance on time and within budget. Thirty-eight (51%) did not expect to have sufficient IT resources and will have to obtain some form of external assistance, such as consultants, contract staff, or the ITSD assistance, to complete their Y2K projects.

Note 16:   " *The Passage to Y2K Compliancy" , the IT Magazine, June 1997.*

108.   In its questionnaire response, the Treasury reported that it planned to hire 15 man-years of contract programmers over three years, in addition to the 15 man-years required from in-house resources. The contract for programmers would expire in mid-1998. The ITSD would negotiate a renewal of this contract and it was likely that costs would increase from those estimated by the Treasury, and approved by the CSG, in 1996.

109.   Any delays in obtaining funding approval may affect an organisation's ability to obtain increasingly scarce IT resources from the external market. If external resources are required, organisations must check to ensure that such resources are available and can be afforded. Government organisations will have to compete with private sector organisations for this increasingly scarce resource, and any shortages may impact on the successful completion of their projects.

Non-IT equipment compliance checks

110.   There is a degree of uncertainty regarding the effects of Y2K on non-IT embedded systems. Predicting where failure may occur is not easy. No two identical models of the same equipment are guaranteed to react in the same way to the onset of the year 2000. Although equipment may be of the same model and production batch, testing for compliance may produce different results.   A large pharmaceutical company tested two identical systems that monitor the performance of drug production: one system passed the Y2K test, the second system did not.

111.   Government organisations have already experienced delays in recognising the risks from Y2K on their non-IT equipment.   It is essential that they are aware of the problem with compliance testing and ensure that similar equipment, particularly mission-critical equipment, is tested to ensure that their equipment is all Y2K compliant.

Conversion process

112.   Audit expected to see organisations actively working on the conversion of their non-compliant systems and equipment by the end of January 1998. The analysis of the survey results indicates that, overall, government organisations are behind schedule, with many still at the assessment phase of their Y2K programmes at the end of January 1998 (see paragraphs 59 and 86 above).

113.   According to a recent study by an international software research firm (Note 17), the time to start fixing the problem was 1995. If an organisation did not start its conversion process until 1997, then it could only hope to have corrected 80% of its applications by 1999. The percentage drops to 60% for any organisation that only begins to fix the problem in 1998. A Y2K programme director of a leading US-based computer firm (Note 18) stated that companies which had not started addressing the issue in early 1997 might not be able to completely resolve the problem before the year 2000.

114.   Failing to commence the conversion process by early 1998, organisations are at risk that they will be unable to correct all non-compliant systems and equipment before year 2000. As the cost of system failures is high, both in terms of money and service provision, the preparation of contingency plans becomes essential.

Deadline for compliance

115.   The Hong Kong Monetary Authority (HKMA) (Note 19) has established 31 December 1998 as the deadline by which all licensed banks and deposit-taking companies are expected to be Y2K compliant. The Hong Kong Stock Exchange has also recommended 31 December 1998 as the deadline for compliance for listed companies, allowing them a year for testing of converted systems.

116.   Audit asked respondents when they expected to be Y2K compliant.   Only 18 (24%) aim to achieve compliance by December 1998. Organisations' estimated compliance dates show that many are leaving essentially no margin of error for any unanticipated delays. Eight respondents aim to achieve compliance in December 1999, leaving no time to address any issues that may require more work or to address any unexpected events. A number of these organisations have large and complex computer systems which also integrate with other government organisations. Two respondents have stated that they are planning to finish in January 2000.

Note 17:   *Software Productivity Research (source: Special Technical Bulletin "Year 2000" Series issued by the Hong Kong Society of Accountants in January 1998).*

Note 18:   *Unisys Information Services (source: Computerworld, 13 March 1997).*

Note 19:   *The HKMA is an integral part of the Government under the direct control of the Financial Secretary. Its role is to promote the stability of the Hong Kong banking system and to maintain currency stability.*

117.   The results from the ITSD's survey in December 1997 (see paragraphs 43 and 44 above) indicate that government organisations will leave the conversion of 131 administrative systems until 1999, with 29 of these not addressed until the second half of the year. Thirty-one non-administrative systems and 155 end-user developed systems will not be converted until 1999. More significantly, 67% of the administrative systems to be converted in 1999 relate to five large government organisations - Immigration, Inland Revenue, Census and Statistics and Housing Departments, and the Police Force. Any delays in their respective conversion processes will have a significant effect on critical government operations.

118.   In the Director of Audit's Report No. 27 of October 1996, Audit reported that 64% of government computerisation projects experienced delays in their implementation. The review examined 62 projects, including administrative and non-administrative computer systems. With an immovable deadline, and the Y2K project likely to be the largest and most significant technology-based project most organisations will undertake, the estimated date for achieving compliance becomes even more crucial for Y2K projects.

119.   The HKMA carried out a second survey on the status of authorised institutions' progress with respect to their Y2K programmes as at 31 December 1997. The survey found that there have been cases of slippage in institutions' Y2K projects, with 10% of authorised institutions behind schedule.

120.   In her questionnaire response, the Director of Immigration has stated that her department aims to achieve compliance by September 1999. This has already been revised, as detailed in the Finance Committee Paper of March 1998, to November 1999. It is possible that, as other government organisations begin their conversion process, they may have to revise their compliance deadlines to a later date.

121.   The ITSD has carried out a second quarterly survey of government organisations as at 31 March 1998. Initial findings suggest that there has been a slippage in the conversion process. The new survey shows that 181 administrative systems will be converted in 1999, as opposed to 131 systems in the initial survey (see paragraph 117 above).

122.   To effectively manage their projects, particularly in light of the late estimated completion dates, it is vital that government organisations define clear and specific milestones, with regular monitoring of progress against these targets. The results from Audit's survey indicate that 43 (58%) respondents had not

established such milestones for their Y2K projects. Monitoring of milestones will highlight any slippages and allow corrective action to be taken promptly to keep the project on course.

Test and validation plans

123. Compliance testing is a crucial phase in the Y2K programme and should be carried out as early as possible in the process. It provides an organisation with assurance concerning newly repaired or replaced systems and equipment. Testing will identify any remaining problems and action that may be required to solve them. There may be a need for a year 2000 test environment that is separate from the normal working environment, or additional computers may have to be hired in order to carry out testing. As such, government organisations need to plan ahead for this phase and secure testing facilities.

124. The results of Audit's survey indicate that 42 (57%) respondents had not developed and documented test and validation plans for year 2000 compliance. Without these plans, it will be difficult for organisations to adequately test the converted systems. Audit notes that one common test site for mainframe systems has been established by the ITSD, with other sites for midrange computers and PCs to be set up in June 1998. The availability of these sites should be widely disseminated to all government organisations as soon as possible.

Contingency and business recovery plans

125. Failure to develop contingency plans for critical systems represents a serious risk to business continuity. No matter how well organised a Y2K project is, systems may still fail on 1 January 2000. Respondents were asked whether they had commenced documenting Year 2000 contingency plans that provide workable alternatives in the event that the organisation is impacted by the Y2K Problem. Sixty-three (85%) respondents had not commenced documenting a contingency plan. Only two had completed this task.

126. Uncontrollable risks including the interruption of essential services, such as electricity and telecommunications, should be addressed as part of an organisation's risk management of the Y2K Problem. External parties have the potential to seriously disrupt an organisation's operations. Seventy-two (97%) respondents had not addressed problems that may arise from external parties' non-compliance.

127. Hong Kong's Y2K progress is currently behind world recognised industry estimates for the completion of Y2K programmes. The UK is widely recognised as one of the most year-2000-ready countries in

the world; yet experts claim that time has already run out to fix everything. The head of the former UK Government body Taskforce 2000 (see paragraph 183 below) recently stated that " it is now fanciful to pretend that the problem will be solved. It is quite simply too late." . Organisations must now concentrate on developing contingency plans to ensure that the bug's impact is minimised. The Director of Action 2000 (see paragraph 184 below), the UK Government's new Y2K taskforce, has also acknowledged that it is now too late to fix everything.

128. In the Government, for example, the Immigration Department has no contingency plans for any of its critical systems due to the absence of any manual systems to which it can revert. The Department has a large number of complex systems, some of which interface with a number of other government organisations. Delays in achieving compliance will therefore affect several critical operations within the Government. Despite this, the Department is not aiming to complete its project until November 1999. Any delays in their project will have a potentially chaotic effect on Hong Kong.

Internal audit

129. Audit examined a sample of government organisations' internal audit plans for 1997-98 and 1998-99. Examination of these revealed that only one organisation's internal auditors had plans to review the Y2K Problem.

130. Internal auditors can play a vital role in assessing an organisation's risk assessments and project plans. The lack of involvement by internal auditors is a lost opportunity to gain assurance that departments are addressing the issue effectively.

Assuring customers

131. Government organisations receive increasing enquiries from both their customers and the media concerning the Government's position and timescales for achieving Y2K compliance. By early 1998, the Government was receiving approximately one call per week from the media, enquiring specifically about which services would be disrupted and how this would affect the general public. This level of interest is expected to increase as the deadline approaches. People will want to know what steps the Government is taking to address the issue and if these are the right steps.

Audit conclusions on the Government's Y2K progress

132.   **The overall rate of progress in the public sector has been slow.   With many government organisations still only at the assessment phase of their Y2K programmes at the end of January 1998, the Government's progress is well behind the industry-accepted Y2K programme timetable.   At the current rate of progress, it is highly likely that many government organisations will not be able to convert all systems and equipment by year 2000.   The Administration should carry out a stock-take of its Y2K whole-of-government progress to date, and critically examine its strategic direction for the whole-of-government for the critical period ahead.**

133.   Audit has noted a number of significant deficiencies in government organisations' assessment of the Y2K Problem, as follows:

Impact assessments

(a) impact assessments were not comprehensive showing a lack of appreciation of the scope of the impact of Y2K. As a result, some key areas of business may be exposed to risks from Y2K-induced failures;

Project management

(b) the lack of a sound project management approach is evident from the absence of well-defined plans;

(c) there was a delay in holding the Y2K workshop - ideally, this should have been held prior to organisations' commencement of their Y2K programmes;

Inventory

(d) there was failure to compile a comprehensive inventory, and this could result in critical systems and equipment not being identified.   This in turn may adversely affect the prioritisation of conversion work;

Resources and funding

(e) there was delay in seeking funding approval and this may be

indicative of a delay in assessing the problem. In addition, government organisations which do not secure external IT resources at a sufficiently early date may be impacted on by expected IT resource shortages;

Test and validation plans

(f) test and validation plans had not been prepared by the majority of government organisations. This could result in a lost opportunity to share testing facilities and reduce costs;

Contingency plans

(g) it may already be too late to rectify all non-compliant systems and equipment. Therefore, organisations must develop contingency plans to ensure that the impact of the Y2K Problem is minimised. At the time of the audit survey, 85% of respondents had not commenced preparing contingency plans;

Project completion

(h) many government organisations do not plan to complete their projects until the second half of 1999. This may be too late. Any unexpected or uncontrollable events may impact on their schedule, resulting in delays and a failure to achieve compliance; and

Internal audit

(i) internal audit's review of Y2K plans offers a good opportunity for an organisation to gain assurance that the issue is being addressed effectively. The failure to carry out such reviews is a lost opportunity.

Audit recommendations on the Government's Y2K progress

134.   **Audit has *recommended* that the Administration should consider taking the following actions immediately:**
   Impact assessment

   (a) continue to keep in view the current status of the

whole-of-government Y2K compliance progress; and then accelerate the assessment phase of their compliance work plan and formulate a strategy to assist those government organisations which are behind schedule;

(b) assist government organisations with impact assessments by developing and disseminating detailed impact assessment guidelines, covering all key areas of business;

Project plan

(c) assist government organisations with their project plan preparation by developing and disseminating detailed guidelines. The Administration may consider using the Audit Commission's questionnaire as a practical guide;

(d) establish a whole-of-government Y2K dedicated helpline to assist government organisations with project planning and management;

Inventory

(e) establish a checking mechanism to ensure the accuracy and completeness of the whole-of-government inventory;

Resources

(f) undertake a stock-take of Y2K resource requirements for the whole government; and then, if required, secure external resources to ensure that there are sufficient resources for the whole-of-government Y2K programme;

(g) encourage and assist government organisations to quickly and accurately calculate the resource requirements; and then seek funding approval to enable the immediate commencement of the conversion of critical systems;

Prioritisation

(h) determine and prioritise whole-of-government business critical systems and equipment; and set a strict timetable

for individual systems and equipment to be repaired or replaced, tested and implemented;

Testing

(i) to avoid any foreseeable shortages of IT facilities, ensure that government organisations have identified their requirements and that these have been secured from suppliers. In addition, the Administration should notify all government organisations of the availability of common test sites and monitor the use of these sites;

Contingency plans

(j) direct all government organisations to commence planning for contingencies and set strict timetables for their completion;

Internal audit

(k) use internal audit in the quality assurance and monitoring process; and

Public assurance

(l) establish an Internet site to enable the public to ascertain the latest government position. This would also serve as a means of assuring the public that the Government is addressing the problem seriously.

PART 4 —   OVERALL PREPAREDNESS OF THE GOVERNMENT

135.   PARTS 2 and 3 above examined the preparedness of individual government organisations.   This PART discusses the Government's **overall** preparedness to address and resolve the Y2K Problem.

Background

136.   The delivery of government programmes and services to the public are undertaken by many government organisations.   They are at various stages in their Y2K programme and have different capacities to manage the problem.   While individual organisations are addressing systems that are critical to their own operations, it is also important that specific attention be given to critical systems that support major programmes and essential services of the Government as a whole.

137.   The Y2K Problem is a far-reaching and resource intensive issue that the Administration must resolve in order to avoid severe disruption to Hong Kong's essential services.   The stakes are high if Y2K failure occurs.   Public safety, health and other essential services are at risk, as well as the public's confidence in the Government.   Audit results indicate that, with the current slow rate of progress, there is a serious risk that the Administration will be unable to achieve compliance for all systems and equipment by year 2000.

The Y2K programme - the Government's position

138.   By January 1998, Audit would expect government organisations to have carried out an awareness campaign; assessed the risks and impacts from year 2000 on their critical business processes; and developed a timed, costed and prioritised project plan.   Audit would also have expected them to have started the conversion phase of their Y2K programmes.

139.   According to an industry expert, it was estimated that the typical phases of a Y2K project would consume the following percentage of total project effort (Note 20):

Note 20:   *Mitretek Information Support Centre, USA, 13 August 1996 and 4 September 1996 (Y2K Maillist Contributions).*

- Awareness: 2%

- Assessment, analysis and planning: 25%-35%

- Conversion and testing: 40%-65%

- Implementation: 5%-25%

140.   The majority of government organisations were still only at the assessment phase, with two other important phases still to be progressed, namely conversion and testing/implementation. These two remaining phases of the Y2K programme will consume a high percentage of total project effort and resources. Testing alone may take at least a year and consume approximately 50% of an organisation's project effort.

141.   Audit's review revealed that many government organisations were already experiencing problems with the first two phases, such as a lack of awareness of the extent of the problem, and the failure to compile comprehensive inventories, project plans, and contingency plans. Audit's questionnaire results indicate that the overall position of the Government, compared with the expected industry timeframe, is well behind schedule and it may therefore experience serious problems in achieving compliance by the immovable deadline.

Urgent strategic direction and action required from the Administration

142.   Time is rapidly running out. There is still much to do, and with an immovable deadline, the stakes for the Government are high. Public health and safety and essential services may be seriously at risk. The Government must act now to safeguard against the possible breakdown of government functions and essential services and disruptions to Hong Kong's economy resulting from Y2K-induced failures. A whole-of-government strategic direction is now crucial and urgently required for the critical period ahead.

143.   The provision of essential services and the protection of public health and safety are paramount. To safeguard these, the Government must prioritise the conversion of systems and equipment to ensure that, at a minimum, all mission-critical systems and equipment are Y2K compliant.

144.   Contingency planning should now be one of the top priorities
for the Government. As mentioned in paragraph 127 above, leading
authorities in the UK, one of the most Y2K-ready countries, have
admitted that it is now too late to fix everything. Organisations
must now concentrate on developing contingency plans for their
critical systems. With 64% of the Government's computerisation
projects in Hong Kong experiencing delays in their implementation,
the issue becomes even more critical.

145.   A number of issues that Audit considers to be important are
leadership, commitment, transparency and the application of rigorous
project management disciplines. Factors which could in any way
delay the Government from achieving Y2K compliance for all its
business-critical systems and equipment must be carefully and
thoroughly considered.

Audit conclusions on the Government's overall preparedness

146.   **There has been no whole-of-government strategic direction to
address the Y2K Problem. Individual policy bureaux and government
departments have been left to address the problem without central
coordination and with minimal guidance. Until the establishment of
the ITBB in April 1998, there was no dedicated government body with
a clear mandate to manage the whole-of-government Y2K Problem.** In a
memorandum dated 31 March 1998 to the Director of Information
Technology Services, the Judiciary Administrator said that:

> " I … suggest that the Administration should take a more
> proactive approach to assist departments to survey and
> tackle the problem, instead of relying on departments to
> fight an uphill battle for resources."

147.   The Administration has failed to issue sufficient guidance to
assist government organisations to assess and plan their Y2K
programmes. Guidance on how to evaluate and manage risks, devise
and manage a project and prepare contingency plans to minimise the
impacts are essential if government organisations are to
successfully address the threat of year 2000.

148.   To date, there has been no prioritisation of
whole-of-government systems and equipment to ensure that all
mission-critical systems and equipment are either repaired or
replaced to ensure their Y2K compliance.

149.   The   Administration   has   not   introduced   a   strict
whole-of-government timetable for the completion of each phase of
the Y2K programme to ensure the timely and satisfactory completion
of the Y2K project.   Such a timetable would provide a basis to
monitor and report on the progress of the whole-of-government Y2K
programme.   Effective monitoring will highlight any slippage or
changes, allowing corrective action to be taken as early as possible
in the Y2K programme.

150.   The Administration has not been well prepared to address the
whole-of-government Y2K Problem.   At the end of January 1998, many
government organisations had still to complete the assessment phase
of the Y2K programme.   One organisation plans to complete this phase
by as late as October 1998.   There are still two important stages to
progress in order to achieve Y2K compliance.   The window of
opportunity for the Government to effectively solve the Y2K Problem
is rapidly closing.

151.   At the current rate of progress, it will be difficult for the
Government to achieve full compliance for all its systems and
equipment by year 2000.   Contingency planning should now be one of
the   Administration's   top   priorities.   Any   failure   of
mission-critical systems and equipment could affect public health,
safety and other essential public services.

152.   **Despite the slow progress to date, the Administration could
still achieve its primary goal of achieving compliance for
mission-critical systems and equipment by the year 2000.   This can
only be done by following rigorous project management disciplines
and through improved whole-of-government coordination and leadership
from the Administration.   Audit welcomes ITBB's whole-of-government
coordinating role and its efforts to date to address the Y2K
Problem.   However, more initiatives, and a quicker pace in its
current efforts, are necessary to remove the many obstacles ahead.**

153.   **In view of the substantial amount of expenditure to be
incurred, it is important that management policies, practices and
procedures for addressing the Y2K Problem should demonstrate due
regard to economy, efficiency and effectiveness.**

Audit recommendations on the Government's overall preparedness

154.   **Audit has *recommended* that the Administration should adopt a
whole-of-government perspective in its approach to the Y2K Problem.
It should:**

— approach Y2K as a business problem and introduce a top-down approach by critically examining its whole-of-government Y2K strategic direction. Key business processes should be identified and the Y2K programme directed towards the conversion of these critical processes. The Administration should take a strong proactive and leading role for the whole-of-government Y2K programme to ensure its satisfactory completion by the year 2000;

— prepare a strategic plan to underpin its Y2K activities on a whole-of-government basis for the critical period ahead. The plan should include a full risk analysis, key objectives and milestones, performance measures and desired outcomes;

— set a strict timetable for the completion of each phase of the Y2K compliance programme to ensure the achievement of compliance for mission-critical systems and equipment by the year 2000;

— establish appropriate mechanisms to monitor the overall progress of the Government's Y2K programme, and establish appropriate procedures to enable the Administration to take immediate remedial action to recover the time lost due to delays; and

— closely monitor the use of Y2K funding to ensure that expenditure is incurred with due regard to economy, efficiency and effectiveness. For example, Audit would expect initiatives to be taken on common issues across the Government, such as bulk contracts for outsourcing.

PART 5 — GOVERNMENT PROMOTION AND MONITORING OF THE Y2K PROBLEM IN THE PRIVATE SECTOR

155.   This PART discusses the role of the Government in the private sector including the NGOs funded or regulated by the Government. It examines government action to date in promoting awareness, government measures to ensure the Y2K readiness of essential service providers, expectations from the business community and additional government initiatives necessary to assist the private sector.

Background

156.   In his Policy Address on 8 October 1997, the Chief Executive of the Hong Kong Special Administrative Region said that:

> " The world economy is undergoing a tremendous transformation. It has entered an era of increasingly open, free and borderless competition.   Rapid developments in information technology will change the way mankind works and lives. Hong Kong now faces the challenge of the information age."

To meet the " challenge of the information age" , it is vital that Hong Kong's business community understand fully the implications of year 2000 on their information systems and business operations. If they fail to address the threat from the turn of the century, it will affect their ability to compete successfully in the world economy in the new millennium.

157.   During the last two decades, the business community has placed increasing reliance on information systems for continued operation and for competitive advantage. The computer to computer exchange of business information will continue to increase in the world business community. The policy direction of the Government, administered by the Business and Services Promotion Unit, is to actively promote the use of electronic commerce and data interchange.

158.   Providers of public services have also placed increasing reliance on computers for the day-to-day provision of essential services. Computer systems and equipment such as railway signalling systems, traffic lights, fire detection systems, and power generators rely on date-sensitive elements to control their operations. Any failures in these critical areas will have a catastrophic effect on the community.

159.   Many Y2K experts are concerned about the potential effects of the Y2K Problem on the medical profession.   In its day-to-day operations, the medical profession has come to rely on IT systems, such as computerised patient records, and date-sensitive equipment. For example, CT scanners, chemotherapy equipment, dialysis machines, intensive care, and laboratory equipment all have embedded microchips which control their operations. Australian health-care professionals have already been warned that " how they prepare for the year 2000 may have life-and-death consequences."   They will be unable to rely on professional indemnity insurance policies to protect them if equipment fails to work properly because of the Y2K Problem (Note 21).

The role of the Government

160.   To empower the business community to compete in the worldwide economy, it is essential that it receives government support in removing obstacles and in creating an environment that is conducive to business development.   In the 1997 Policy Address, the Chief Executive of the Hong Kong Special Administrative Region said that:

> " My   Administration   will   strive   to   improve   the environment for business in Hong Kong …. Our efforts will   be   directed   to   increasing   our   external competitiveness ….   We will do everything to remove obstacles and constraints to business development."

161.   The Government's Policy Bureaux are responsible for the overall policy of the Government. Their objectives are part of the Government's economic strategy to maintain the prosperity of Hong Kong and to ensure the continuity of essential public services. For example, regarding the objectives of the following Bureaux, in the 1997 Policy Address, the Chief Executive of the Hong Kong Special Administrative Region said that:

> —   ***Economic Services Bureau:***   " The Bureau's primary objective is to ensure that Hong Kong has the economic infrastructure to   enable   it   to   compete   with   the   rest   of   the   world. Specifically   we   seek   to   ensure   state-of-the-art telecommunications facilities, … and adequate and efficient supplies of energy …." ;

Note 21:   *Chairman of the Australian Stock Exchange and Chairman of the Australian Government's Year 2000 Steering Committee, April 1998.*

- *Trade and Industry Bureau:* " Helping manufacturers and the services sector to remain competitive in international markets …. We will seek to upgrade Hong Kong's industrial and technological infrastructure." ;

- *Transport Bureau:* " The aims of the Bureau are to ensure that public transport services are safe, ... reliable, … and efficient .…" ; and

- *Health and Welfare Bureau:* " The bureau's objective is to safeguard and improve the health of the community. We seek to achieve this goal by … improving the quality of services in our clinics and hospitals."

162. The Government's Trade and Industry Bureau is committed to " providing quality service to facilitate trade and ensure compliance." As part of this objective, the Community Electronic Trading Service (CETS) began commercial operation in January 1997, enabling traders to apply for textile export licences or to lodge trade declarations on-line. To ensure the success of the CETS system, it is essential that computer hardware and software used by traders submitting data are Y2K compliant.

163. A number of public services in Hong Kong, such as the provision of electricity and public transport, are franchised by the Government to private sector organisations. For example, in the Scheme of Control Agreement entered into by the Government and the Hongkong Electric Company, Limited (HEC), it was stated that:

- " … the Government has to be assured that service to all consumers shall at all times be adequate to meet demand, and will be efficient .…" ; and

- " HEC recognises its continuing obligations to contribute to the development of Hong Kong by providing sufficient facilities to meet the present and future demand for electricity …." .

164. Similarly, by law, the Mass Transit Railway Corporation and the Kowloon-Canton Railway Corporation have an obligation to continue operating the railway systems to meet the public transport requirements of Hong Kong.

165. To assess the actions of the Government to overcome the Y2K

Problem so as to maintain the competitiveness of the Hong Kong business community and to ensure the continuity of essential public services, Audit examined:

— policy bureaux and government departments' activities to raise awareness of the Y2K Problem in the private sector;

— policy bureaux and government departments' activities to monitor progress of Y2K compliance of essential service providers;

— the timing of any action taken to raise awareness; and

— the results of government action to date.

166.   Year 2000 is an immovable deadline. It is imperative that organisations are aware of the potential problems of year 2000 at a sufficiently early date. This will allow them adequate time to assess systems for Y2K compliance and then convert, test and implement any amendments. To gauge the level of awareness of the problem in the private sector, and how well these organisations are planning to manage and solve the problem, Audit conducted a survey of a wide range of NGOs and private sector organisations during January 1998 (see paragraph 27 above).

Actions of the Government to promote awareness and monitor progress

167.   The HKMA has taken a number of initiatives to ensure that licensed banks and deposit-taking companies take appropriate steps to address the Y2K Problem. Under its supervisory approach, the HKMA issued letters to the Hong Kong Association of Banks and the Deposit-taking Companies Association in August 1996 informing them of the Year 2000 Problem. This was complemented by surveys in April and December 1997 on how and when licensed banks and deposit-taking companies expected to fully address the Y2K Problem.

168.   In a letter dated 13 March 1998 to the Secretary for the Treasury, the Deputy Chief Executive of the HKMA highlighted their concerns over the " apparent lack of awareness in other business sectors."   The letter also mentioned that a number of banks were concerned   about   the   lack

of awareness on the part of their customers, particularly small and medium-sized enterprises (SMEs). The HKMA advocated the establishment of a specialised task group by the Government to coordinate their Y2K policies and action plans in the private sector.

169. On 2 June 1997, the insurance regulator, the Office of the Commissioner of Insurance, issued a letter to all authorised insurers, authorised brokers and the Motor Insurers' Bureau of Hong Kong. The letter drew recipients' attention to the " magnitude and urgency of the problem", the possible shortage of skilled resources, the need to solve the problem by December 1998 (allowing one year for testing), and guidance on information to be included in project plans. Insurers and brokers were requested to complete a questionnaire detailing their plans to ensure that critical systems were compliant.

170. The Transport Department's actions have been limited to providing assistance to operators of government tunnels. In June 1997, it issued a letter to tunnel operators that highlighted the Y2K Problem and the need for compliance in respect of their computers and any electronic and mechanical systems that have embedded computing elements. The Transport Department and the EMSD are providing assistance to the various tunnel operators to ensure that their systems are Y2K compliant. At a meeting with the tunnel operators in January 1998, the Transport Department and the EMSD requested tunnel operators to submit testing procedures of the tunnel equipment affected by Y2K. These would be examined and validated by the EMSD.

171. During the first half of 1997, with a grant of $360,000 from the Government-financed Industrial Support Fund (ISF), the Hong Kong Productivity Council (HKPC) conducted a survey in the private sector on the impact of the Y2K Problem. Their survey findings indicated that there was a real problem with awareness and understanding on the Y2K issue among SMEs in Hong Kong. Close to 40% of respondents had not heard of the problem. The survey results also suggested that awareness was not the only problem, that SMEs also faced difficulties in actually solving the Y2K Problem. Of those who were affected, 73% did not have any plan to solve the problem and 41% did not have sufficient in-house resources to deal with the problem.

172. In August 1997, the HKPC published a guidebook that aimed to provide guidelines and sources of information for solving the Year 2000 date problem. It also held a Y2K awareness seminar in September 1997.

173.   Based on the results of its survey, the HKPC submitted an
additional funding proposal to the ISF in July 1997 for
$1.13 million.   The objective was to provide both an awareness
programme and technical assistance to local companies to cope with
the   challenges   arising   from   the

Y2K Problem. The funding application was not approved and the HKPC was informed of the decision in January 1998, six months later.

174.   Following its decision on the HKPC's proposal, the Director-General of Industry, who administers the ISF, approved a funding application from the Hong Kong Computer Society (HKCS) on 20 January 1998. The HKCS had submitted a funding application for $495,000 to the ISF to promote Y2K awareness to SMEs in Hong Kong. Under this awareness campaign, the HKCS plans to produce a short video and a pamphlet, and to launch awareness information on the Internet. In its funding submission, the HKCS stated that:

> " If the SME in Hong Kong are not ready for the Year 2000 compliance, they will lose their competitiveness to other competitors in the region such as Singapore and Taiwan. That is why it is important that the SME, especially in the manufacturing and trading industries…should be aware of the Year 2000 issue."

Providers of essential services in the community

175.   The Administration is heavily reliant upon the private sector and the NGOs to provide essential services, for example, power utilities, health and telecommunications, to the community. An efficient and uninterrupted supply of these services is of paramount importance to the welfare of the public and the business community. Proper and effective government monitoring of these service providers' operations is necessary and ensuring Y2K compliance should be an essential part of this control programme.

176.   Audit's survey of private sector organisations and the NGOs (see paragraph 27 above) included 16 organisations which provide essential services to the community. Audit's findings show that all of these are affected and have drawn up a project plan to address the Y2K Problem. A significant proportion (31%) of these providers do not aim to complete their projects until 1999, with 19% leaving completion until the second half of 1999.

177.   Historically, many computerisation projects experience delays. It is important that the Government monitors the progress of essential service providers to ensure that they are addressing the issue effectively and will continue to provide an efficient and effective service in the next millennium.

178.   In a memorandum to the Secretary for the Treasury on
5 February 1998, the Director of Information Technology Services
proposed a Year 2000 action plan for:

—   private sector operators of essential services (e.g. power
      utilities, transport operators);

—   public   corporations   (e.g.   Kowloon-Canton   Railway
      Corporation);

—   service and management contractors (e.g. vehicle examination
      centres); and

—   Build-Operate-Transfer operators (e.g. tunnels).

179.   Under the proposed action plan, the Government would request
compliance action plans and receive progress reports on a quarterly
basis.   In addition, policy bureaux and government departments would
sponsor promotional activities directly or through industry bodies
and consider appropriate forms of assistance to private enterprises,
particularly SMEs.   Since mid-April 1998, Audit has noted an
increase in government action on this proposed plan through the
newly established ITBB (see paragraph 50 above).   Letters were
issued to Policy Secretaries requesting them to monitor the progress
on the Y2K compliance plans of the NGOs within their areas of
responsibility.

Overseas governments - actions to address the Y2K Problem

180.   Our examination of awareness of the Y2K Problem in the
private sector included a review of the role played by overseas
governments in bringing the problem to the attention of the business
community and the initiatives taken by these governments to assist
the business community to address the problem.

Singapore

181.   In late 1996, the Government of Singapore set up a joint
private/public sector Y2K Awareness Taskforce.   Its membership
included representatives from the Singapore Government's National
Computer Board (NCB), the user community and the IT industry in
organising seminars, conferences and exhibitions to raise awareness
of the year 2000.   The Singapore Government has also provided
grants, under the Local Enterprise Computerisation Programme, for

SMEs to help defray the cost of Y2K implementation consultancy.
182. Due to the current regional economic crisis, the Singapore Government has recently announced that it will pay up to 70% of year 2000-related consultancy fees right up to the 31 December 1999 deadline. Previously, the deadline was the end of 1998. Despite this extension, the NCB has stated that it hopes SMEs will not wait until the middle of 1999 to begin their year 2000 conversions.

United Kingdom

183. In 1996, Taskforce 2000 was formed with the objective of raising awareness of the Y2K Problem with senior decision-makers throughout the UK economy. It was sponsored by the Department of Trade and Industry (DTI) and private companies, and included representatives from the Confederation of British Industry, the Computing Services and Software Association, the Federation of the Electronics Industry and the National Computing Centre. UK government bodies, such as the Central Information Technology Unit (which operates from within the Office of Public Service) and the Central Computer and Telecommunications Agency collaborated with Taskforce 2000 to raise awareness in industry and commerce.

184. In 1997, Taskforce 2000 was replaced by a new body, Action 2000. Its role in relation to the private sector is:

    —   to offer direct support for SMEs;

    —   to collaborate with large companies to encourage them to support smaller companies;

    —   to advise the UK Government on where its resources could be best directed to help the private sector tackle the problem; and

    —   to contribute to contingency planning across the public and private sectors.

185. Action 2000 has set up a helpline that handles enquiries from callers wanting to know about the Y2K Problem, how it impacts them and what they can do to minimise their exposure to the problem. It has also set up a web site and published a guidebook and seven factsheets. Another initiative is the BugNet, which is a support group network comprising interest groups, government bodies and industry-support networks that are active on the Y2K issue. Their purpose is to share information, advice and best practice,

particularly within the SME community.

186.   Both Singapore and the UK are considered to be two of the most Y2K-ready countries in the world.   The public/private sector collaboration and availability of information and assistance, in particular the hands-on approach to Y2K compliance among Singaporean businesses, has undoubtedly contributed to this situation.

Other countries

187.   Several overseas governments, for example, New Zealand, Sweden and the United States, have enacted, or are in the process of enacting, legislation to ensure that the business community and government departments adequately address the Y2K Problem. Their objective in introducing such legislation is to prevent possible disruptions to essential services and to protect the competitiveness of their business communities.

Audit observations on the private sector's Y2K Problem

188.   Although the HKCS awareness campaign (see paragraph 174 above) may assist SMEs to recognise the problem, it may be too little and too late for many organisations.   Ideally, to allow sufficient time to achieve Y2K compliance, awareness campaigns should have been completed by the end of 1996, rather than in the first quarter of 1998.   Government funding may be misdirected if it does not address all the Y2K issues affecting SMEs in Hong Kong.

189.   The HKPC survey (see paragraph 171 above) revealed that a large number of SMEs which would be affected by the year 2000 did not have plans or sufficient resources to solve the problem.   This suggests that awareness of the year 2000 is not the only issue affecting SMEs.   Respondents have serious problems in actually solving the Y2K Problem.   An overwhelming majority of respondents thought that the Government should assist organisations to review existing systems and make recommendations for solving the problem, rather than just raising awareness.

190.   The implementation of the Director of Information Technology Services' proposed action plan (see paragraphs 178 and 179 above) by the newly established ITBB is a welcome development.   However, Audit considers that commitment and strong support by bureaux and departments are essential for its success.

191.   The Y2K Problem has the potential to seriously affect the Hong Kong economy and erode Hong Kong's global competitiveness.   It may also have a severe effect on the provision of essential public

services such as transport, utilities and health. It is imperative
that the Administration provides strong leadership, direction and
initiatives to address the problem in the private sector. If
necessary, regulatory control should be strengthened to protect the
community from possible disruption of essential services from Y2K
non-compliant service providers. At present there are insufficient
monitoring mechanisms within the Government to ensure that essential
service providers are actively addressing the Y2K Problem and are on
schedule to achieve compliance.

192.   The Government has failed to address the Y2K Problem in the
private sector in a comprehensive, coordinated and systematic way.
As at the end of March 1998, there was no central policy directive
or one dedicated government organisation with overall responsibility
for managing and coordinating the dissemination of Y2K information
to the private sector. Although a number of government
organisations have conducted their own individual awareness
programmes or introduced their own monitoring mechanisms (see
paragraphs 167 to 174 above), there has been no consistent,
comprehensive coverage of the issue from the Government as a whole.
Audit welcomes the ITBB's new coordinating role. However, the
absence of such an initiative from a dedicated government
organisation until mid-April 1998 could have resulted in possible
duplication of effort and a waste of government resources. It could
have also resulted in sectors of the economy being overlooked with
regard to awareness campaigns. The lack of an effective government
monitoring mechanism to assess the progress of essential service
providers' Y2K compliance may put at risk the welfare of the public
and the competitiveness of the business community.

193.   Unlike a number of overseas governments, such as Canada,
United States and Australia, the Hong Kong Government does not
maintain a web-site on the Y2K Problem for public access. The US
Government's Small Business Administration has created a Y2K page to
help companies decide whether they are affected by the problem and
determine how to address it. Without such a dedicated page, many
SMEs in Hong Kong do not have access to information to assist them
in assessing the impact of year 2000 on their operations and how to
solve related problems.

**Private sector requests for additional initiatives from the
Government**

194.   The results of Audit's survey of the private sector (see
paragraph 27 above) indicate that awareness of the Y2K Problem is
high. Almost 94% of respondents claim to be aware of the issue,
with 92% claiming to understand the implications of year 2000 on
their operations. The considerable amount of publicity in the media

over the last 12 months may have increased awareness among private sector organisations since the HKPC conducted its survey in the summer of 1997.

195.   During Audit's analysis of responses, no significant difference in responses was noted between the NGOs and private sector organisations. As a result, findings for the different types of organisations have been combined in the subsequent analysis.

196.   The Y2K Problem represents a significant and widespread threat to the competitiveness of Hong Kong's private sector with 140 (80%) respondents stating that they are affected by the problem. Of those who are affected:

   —   77% have drawn up project plans for addressing the issue;

   —   39% do not aim to complete their projects until 1999; and

   —   51% do not have sufficient in-house resources to deal with the project.

197.   Although a high percentage of respondents have prepared project plans to address the problem, a number of factors may impact on these plans and lead to a delay in achieving compliance by the deadline.

198.   The majority of respondents do not have sufficient resources to address their Y2K problems. The HKPC survey also recorded a high percentage of respondents with a similar problem. Those with insufficient in-house resources may be impacted by IT resource shortages in the external market. They will have to compete, along with government organisations, for increasingly scarce and expensive resources.

199.   Historically, IT project track records indicate that many organisations do not meet their implementation deadlines. Thirty-nine per cent of respondents are planning to complete their projects in 1999, with many of these in the second half of 1999. For 16% of respondents, this completion date had yet to be determined. To allow for project delays, it is important for organisations to leave a sufficient buffer between completion and 1 January 2000, particularly for those respondents who are reliant on external resources to solve their problem.

200.   It is vital for organisations to assess the risk to their operations from non-compliant external parties and to develop contingency plans to address this threat. Of those who were aware of the Y2K Problem, only 46% had assessed the year 2000 status of external parties (respondents are mainly from the financial,

telecommunications, tourism and transport sectors of the community). Only 35% had developed contingency plans to deal with potential threats from these external parties. Failing to consider the impact from external parties, organisations have not carried out a systematic and comprehensive assessment of the impact of the Y2K Problem on their operations. This may indicate that awareness and understanding of the issue is not as extensive as respondents claim.

201. In the questionnaire, Audit asked respondents what they thought the Government should do to assist the public to solve the Year 2000 Problem. The survey results indicate that:

— 90% of respondents believed that the Government should do more to increase the public's understanding of the Y2K Problem;

— 90% thought that the Government should provide information for the public to solve the Y2K Problem; and

— 71% thought that the Government and private sector should cooperate to address the Y2K Problem by creating a joint public/private sector taskforce.

202. Those surveyed were also asked to provide any additional comments on what they thought the Government should do to address the Y2K Problem. A significant number of respondents supplied additional comments, some of which are detailed at Appendix D. The comments ranged from requests for more seminars and televised coverage of the problem to subsidies to help meet the costs of conversion:

— " The Government must develop a programme to warn the public of the risks, potential damages and the urgency of the issue. The Government must also drive the necessary changes or issue guidance to regulatory bodies so that they can all take a common approach to resolve this problem as soon as possible." ;

— " Y2K is a complicated problem which is beyond the capacity of most small to medium organisations. The Government should formulate an action list and commission a task force, or the Hong Kong Productivity Council, to provide services to these organisations." ; and

— " We are also concerned with the services provided by public utilities…. We certainly hope that these services would not be affected by Year 2000, and would like to have an open channel where we can get hold of their progress in tackling the Year 2000 issue."

203. It is significant to note from the survey that only 23% of respondents were aware of or had received any government publications, correspondence, etc. relating to the Y2K Problem. These were mainly from the financial and transport sectors.

204. In the HKPC survey of private sector organisations, respondents were asked to comment on the Government's role in addressing the Y2K Problem. Their findings, based on 693 respondents, indicated that:

— 86% thought the Government should assist the public to increase understanding of the problem; and

— 90% thought the Government should provide more information for organisations to solve the problem.

205. Although the HKPC's survey was conducted in early 1997, compared to Audit's survey in January 1998, the findings were consistent. In the opinion of the Hong Kong business community, the Government should be doing more to assist the private sector to understand and address the Y2K Problem.

Audit conclusions on the private sector's Y2K Problem

206. **The results of Audit's survey indicate that, although awareness of the issue is high, there is still a long way to go in addressing the Y2K Problem.** Almost 90% of the organisations want more initiatives from the Government to enable them to solve their problems.

207. **The Government has failed to address the Y2K Problem in the private sector in a comprehensive, coordinated and systematic way. As a result, it has not been fulfilling its role of creating an environment that is conducive to business development.** Until the establishment of the ITBB in April 1998, there was no dedicated government body with overall responsibility for the dissemination of Y2K information to the private sector, to facilitate the private sector to address the Y2K Problem or to monitor the progress of Y2K compliance for providers of essential services in the community.

Without further initiatives from the Government, there is a real danger that the private sector will be unable to cope with this mammoth problem.

Audit recommendations on the private sector's Y2K Problem

208.   **Audit has *recommended* that the Administration should:**

   (a) **critically re-examine the Government's goals, role and responsibilities for helping the business community to manage the Y2K Problem;**

   (b) **perform a stock-take of its efforts to date and use the results to determine the best way forward;**

   (c) **take a pivotal role in creating an environment where the Government and the business community can work together to solve the problem;**

   (d) **consider strengthening regulatory control to ensure that providers of essential services are Y2K compliant in order to avoid major disruptions to the community;**

   (e) **encourage essential service providers in the private sector to complete their Y2K programme by the start of one full business cycle in advance of year 2000;**

   (f) **consider establishing monitoring and reporting mechanisms to oversee the Y2K compliance programmes of providers of essential services. To ensure the overall progress towards Y2K compliance, regular progress reports should be requested detailing any significant delays in their project schedules and the reasons for such delays; and progress in the development of contingency plans. In monitoring the progress towards Y2K compliance, particular attention should be paid to the Hospital Authority and the public transport operators (e.g. Mass Transit Railway Corporation and Kowloon-Canton Railway Corporation), where system and equipment failures may endanger the lives of the patients or put the safety of the travelling public at risk; and**

   (g) **consider creating a web site in the Internet to provide easy access and up-to-date information to the public to enable them to address the Y2K Problem.**

PART 6 — RESPONSE FROM THE ADMINISTRATION

209.   This PART sets out the Administration's comments on the audit report.   The comments are grouped into three categories, i.e. overall comments, comments on the Y2K work of government organisations and comments on the role of the Government in the private sector, including the NGOs.

Overall comments

210.   The **Secretary for Information Technology and Broadcasting** welcomes the audit report which he considers useful to the Y2K work of the Administration.   He has said that:

—   he accepts most of the audit recommendations.   Many of them have already been covered in the action agenda of the Steering Committee on Year 2000 Compliance which was established in March 1998 and chaired by him (see paragraph 50 above);

—   efforts to rectify the Y2K Problem in the Government started long before the establishment of the Steering Committee. Since 1996, the ITSD has been actively promoting awareness of the Y2K Problem within the Government through various channels.   In addition, the ITSD, the EMSD and OFTA have been providing technical assistance to the affected policy bureaux and government departments in their rectification work.   The establishment of the Steering Committee has enabled the rectification work within the Government to be taken forward in a more coordinated manner.   It has also resulted in a more focused approach to promoting awareness and understanding of the Y2K Problem on a community-wide basis; and

—   the Administration is now targeting at completing all Y2K rectification work by mid-1999.   This includes the computer systems of the Immigration Department mentioned in paragraph 128 above.

Government organisations

211.   With regard to Audit's recommendations on the Y2K work of government organisations, the **Secretary for Information Technology and Broadcasting** has said that:

   Urgent assistance to government organisations

(a) on providing urgent assistance to those government organisations which are still in the process of completing the awareness phase of their programme (see the third inset of paragraph 73 above), the ITSD, the EMSD and OFTA provide various forms of assistance to government organisations in relation to the Y2K Problem and the ITBB plays a central coordinating role;

Y2K compliance assurance

(b) on obtaining Y2K compliance assurance from essential service providers to ensure continuity of service for the whole Government (see the fourth inset of paragraph 73 above), the Steering Committee on Year 2000 Compliance is working on this through the respective policy bureaux and government departments which are responsible for the operation of the essential service providers;

Regular progress reports

(c) on ensuring that senior managers of government organisations receive regular progress reports on their respective Y2K projects (see the second inset of paragraph 74 above), all government departments and NGOs funded or regulated by the Government are now required to submit regular progress reports on Y2K rectification work to the Steering Committee which plays a central monitoring role;

Development of detailed guidelines

(d) on assisting government organisations with impact assessment by developing and promulgating detailed impact assessment guidelines (see paragraph 134(b) above), the assessment work is performed by individual government organisations. The Steering Committee and the three central services departments, i.e. the EMSD, the ITSD and OFTA, will continue to provide guidance for work in this respect;

(e) on assisting government organisations with their project plan preparation by developing and disseminating detailed guidelines (see paragraph 134(c) above), the three central services departments are providing such guidelines and will continue to do so. The Administration can forward Audit's questionnaire to government organisations for reference;

Y2K dedicated helpline

(f) on establishing a whole-of-government Y2K dedicated helpline to assist government organisations with project planning and management (see paragraph 134(d) above), the ITSD, the EMSD and OFTA are centrally dealing with Y2K problems relating to computer systems, electrical and mechanical equipment and line communication systems respectively. Government organisations can also approach the ITBB, which plays a central coordinating role, for assistance;

Inventory, resources, prioritisation, testing and contingency plans

(g) on inventory, resources, prioritisation, testing and contingency plans (see paragraphs 134(e), (f), (g), (h), (i) and (j) above), work in these areas is in hand. He will seek external resources where necessary;

Internal audit

(h) on using internal audit in the quality assurance and monitoring process (paragraph 134(k) above), he will recommend to government organisations to adopt this approach;

Internet site

(i) on establishing an Internet site to enable the public to ascertain the latest government position (see paragraph 134(l) above), he will establish a dedicated Year 2000 web site under the Government Information Centre Home Page by the end of June 1998; and

Adopting a whole-of-government perspective

(j) on adopting a whole-of-government perspective in the Administration's approach to the Y2K Problem (see paragraph 154 above), the Steering Committee is working in the direction as suggested by Audit and will continue to monitor the progress of the rectification work.

Private sector

212.   With regard to Audit's recommendations on the role of the Government in the private sector including the NGOs funded and regulated by the Government, the **Secretary for Information Technology and Broadcasting** has said that:

Government's goals, role and responsibilities

— on critically re-examining the Government's goals, role and responsibilities for helping the business community to manage the Y2K Problem (see paragraph 208(a) above), the terms of reference of the Steering Committee include the need for the Government to work out and implement a strategy for promoting awareness of the Y2K Problem on a community-wide basis;

Strengthening regulatory control

— on strengthening regulatory control to ensure that providers of essential services are Y2K compliant (see paragraph 208(d) above), the Government is monitoring, through the respective policy bureaux and government departments, the compliance position of providers of essential services which are regulated by the Government and the progress of their rectification work; and

Various measures

— on performing a stock-take, establishing a monitoring mechanism, creating an Internet web site and creating an environment to work together to solve the problem (paragraphs 208(b), (c), (f) and (g) above), they are already covered by the ongoing work of the Steering Committee.

**Government organisations
which had furnished their returns to Audit's questionnaire**

(The questionnaires were sent out on 24 December 1997 with a request to submit completed returns by 31 January 1998. Only 24 completed returns were received by the closing date and the last return was received on 16 March 1998.)

Agriculture and Fisheries Department
Architectural Services Department
Auxiliary Medical Service
Broadcasting, Culture and Sport Bureau
Buildings Department
Census and Statistics Department
Chief Secretary for Administration's Office
Chief Secretary for Administration's Office, Administration Section, Departmental
    Administration Unit
Chief Secretary for Administration's Office, Government Records Service Division
Civil Aid Service
Civil Aviation Department
Civil Engineering Department
Civil Service Training and Development Institute
Companies Registry
Constitutional Affairs Bureau
Correctional Services Department
Customs and Excise Department
Department of Justice
Drainage Services Department
Economic Services Bureau
Education Department
Education and Manpowers Bureau
Efficiency Unit
Electrical and Mechanical Services Department
Environmental Protection Department
Finance Bureau
Financial Services Bureau
Fire Services Department
Government Flying Service
Government Laboratory
Government Land Transport Agency
Government Property Agency
Government Supplies Department
Health and Welfare Bureau
Health Department
Highways Department
Home Affairs Bureau
Home Affairs Department

Hong Kong Monetary Authority

Hong Kong Observatory
Hong Kong Police Force
Hong Kong Post Office
Hospital Services Department
Housing Bureau
Housing Department
Independent Commission Against Corruption
Immigration Department
Industry Department
Information Services Department
Information Technology Services Department
Inland Revenue Department
Judiciary
Labour Department
Land Registry
Lands Department
Legal Aid Department
Mandatory Provident Fund Office
Marine Department
Office of Telecommunications Authority
Office of the Commissioner of Insurance
Official Languages Agency
Official Receiver's Office
Planning Department
Planning, Environment and Lands Bureau
Printing Department
Radio Television Hong Kong
Rating and Valuation Department
Regional Services Department
Registration and Electoral Office
Security Bureau
Social Welfare Department
Student Financial Assistance Agency
Television and Entertainment Licensing Authority
Territory Development Department
Trade and Industry Bureau
Trade and Industry Bureau - Community Electronic Trading
Service
Trade Department
Transport Bureau
Transport Department
Treasury
University Grants Committee
Urban Services Department
Water Supplies Department
Works Bureau

**Government organisations which have stated that
they are not affected by Y2K Problem in their returns furnished to
Audit**

Agriculture and Fisheries Department

Auxiliary Medical Service

Broadcasting, Culture and Sport Bureau

Chief Secretary for Administration's Office

Civil Aviation Department

Economic Services Bureau

Home Affairs Bureau

Planning, Environment and Lands Bureau

Trade and Industry Bureau (excluding CETS)

Efficiency Unit

**Government organisations which either had not furnished
their returns in response to Audit's questionnaire
or had furnished their returns too late for consideration**

Central Policy Unit

Civil Service Bureau

Intellectual Property Department
(Questionnaire received too late
  for consideration - 23 April 1998)

Management Services Agency

**Some additional comments from
private sector organisations on the role of the Government**

(a)   " The Government should take a proactive role to assist the public to understand the Y2K Problem and where they can get help.   More importantly, because of inter-department dependencies, the Government should ensure that all internal and external systems that interconnect should be free of potential Y2K Problems.   A taskforce should be set up to coordinate and certify all such systems."

(b)   " To set up a unit to coordinate the activities of Government to handle the Year 2000 problem and let the public know the progress and the effect to the public.   Educate the public about the Year 2000 Problem and what steps should be taken to deal with software/hardware vendors to protect from any loss."

(c)   " Provide hotline on Year 2000 acquisition; contract out Y2K experts to organisations; increase public awareness of the Year 2000 problem."

(d)   " Provide enough funding and resources to related organisations to carry out their Year 2000 Programme."

(e)   " The Government may enforce Y2K compliance actions to be taken by organisations, especially those have impact on general public, through legislation."

(f)   " … conduct seminars and arrange experts as speaker."

(g)   " All companies, including Government, affecting the public should be committed that their systems are Year 2000 ready e.g. utility companies, civil aviation.   Appropriate law should be established."

(h)   " To organise discussion meeting/seminar (by industry) for public and private sectors to share and exchange opinions and experience; via Internet.   To organise task force to assist organisation to tackle Year 2000 problems/concerns; via Internet."

(i)   " More publications; more educational programs on TV."

(j)   " In view of the recent financial crisis and losses may be
       expected in a lot of sectors; the prices in installing new
       system may be tremendous for business. Government subsidies
       should be made in order to ensure competitiveness of all
       business sectors."

(k)   " Government should provide subsidy to those organisations who
       may have resource/expertise difficulties in tackling the
       Year 2000 Problem."

(l)   " The Government should provide solid example of Year 2000
       Conversion Projects using typical computer environment so that
       concerned organisations can kick off the project and solve the
       issue in a more efficient and effective way."

(m)   " Promote awareness and understanding of the issues related to
       the Year 2000 problem, especially for small businesses.
       Provide   year 2000   related   guidelines/directives   to
       organisations involved in public services (e.g. similar to
       those given by the Monetary Authority to banks and financial
       institutions)."

(n)   " To provide information for the private sector concerning the
       Year 2000 Problem tackled by the related Government Department
       in similar industry e.g. Hospital Authority."

(o)   " ITSD should take a more active role in advising the IT
       community on Y2K impact relating to Government bodies. What
       has ITSD done so far?"

(p)   " It should do this work a bit earlier. Government should
       provide more information and technical assistance to small and
       medium size firms that would be affected by the problem.
       There are shortages of programmer that Government should
       provide training, out-source programme, and conversion tools."

(q)   " To enhance the public's understanding of the issue and the
       progress made in different key industries in the upcoming
       years, the Government should consider gathering information
       from different sources and publishing periodic status reports
       on the readiness of the different key industries in addressing
       the issue."

Acronyms and abbreviations

CETS   Community Electronic Trading Service

COBOL   Common Business-oriented Language

CMIS   Computerised Costing and Management
Information System

CSG   Computer Strategy Group

DTI   Department of Trade and Industry
                (United Kingdom)

EMSD   Electrical and Mechanical Services Department

HKCS   Hong Kong Computer Society

HKMA   Hong Kong Monetary Authority

HKPC   Hong Kong Productivity Council

ISF   Industrial Support Fund

IT   Information Technology

ITBB   Information Technology and Broadcasting Bureau

ITSD   Information Technology Services Department

NCB   National Computer Board
       (Singapore Government)

NGOs   Non-government organisations

OFTA   Office of Telecommunications Authority

PCs   Personal computers

SMEs   Small and medium-sized enterprises

UK   United Kingdom

USGAO   United States General Accounting Office

Y2K   Year 2000

YPMG   Year 2000 Compliance Programme Management Group