



RESEARCH PAPER 98/72
30 JUNE 1998

The Millennium Bug

Many computer systems, programmes and electronically controlled equipment are unable to perform correct calculations involving dates which fall after 31 December 1999. This is a result of the common practice in the 60s and 70s of using two digits to indicate the year, e.g. 98 for 1998, to save valuable computer memory space. Unless reprogrammed, bypassed or replaced these systems will malfunction at the turn of the century, if not before, with wide ranging consequences. This problem has been dubbed the “millennium bug” or Year 2000 computer problem (Y2K).

This paper provides a current analysis of the situation as outlined in last year’s POST Note No.98. It explains what the millennium bug is and considers the range of systems that it could affect both within the public and private sector. It also examines the action being taken by Governments and organisations, both in the UK and around the world, to tackle the problem.

Emma Downing

SCIENCE AND ENVIRONMENT SECTION

HOUSE OF COMMONS LIBRARY

Recent Library Research Papers include:

98/57	Northern Ireland: political developments since 1972	11.05.98
98/58	Unemployment by Constituency - April 1998	13.05.98
98/59	The local elections of 7 May 1998 and the London Referendum	12.05.98
98/60	Unemployment by Constituency: Welfare-to-Work Groups - April 1998	13.05.98
98/61	Parliamentary Pay and Allowances: Current Rates	18.05.98
98/62	The <i>Registration of Political Parties Bill</i> Bill 188 of 1997-98	01.06.98
98/63	Bovine Tuberculosis	01.06.98
98/64	GDP per capita in OECD countries: the UK's relative position	04.06.98
98/65	Northern Ireland: The Release of Prisoners under the <i>Northern Ireland (Sentences) Bill</i> Bill 196 of 1997-98	15.06.98
98/66	Council Tax Capping in 1998/99	16.06.98
98/67	Unemployment by Constituency - May 1998	17.06.98
98/68	'Age of Consent' for Male Homosexual Acts	19.06.98
98/69	Rent levels, affordability and housing benefit	22.06.98
98/70	Agriculture and the Environment	24.06.98
98/71	Economic Indicators	01.07.98

Research Papers are available as PDF files:

- *to members of the general public on the Parliamentary web site,
URL: <http://www.parliament.uk>*
- *within Parliament to users of the Parliamentary Intranet,
URL: <http://hcl1.hclibrary.parliament.uk>*

Library Research Papers are compiled for the benefit of Members of Parliament and their personal staff. Authors are available to discuss the contents of these papers with Members and their staff but cannot advise members of the general public.

CONTENTS

I	Introduction	7
II	What is the Millennium Bug?	8
III	What systems will be affected?	9
	A. Embedded systems	9
	1. Personal Computers	10
	2. Building systems	11
IV	What could go wrong?	12
	A. Economic Impacts	12
V	Government Action	14
	A. Ministers and Government Departments	14
	1. Ministerial Group (MISC 4)	15
	2. Year 2000 Team	15
	B. Action 2000 and Taskforce 2000	15
	C. Contingency plans	16
	D. Training	17
VI	International Action	18
	A. Europe	18
	1. Commission Communication	18
	2. EU Conference	19
	B. G8 Summit	20
	C. Case Studies	20
	1. America	20
	2. Canada	21
	3. Asia	22
VII	How can the problem be fixed?	24

VIII	Public Sector	26
A.	Local Authorities	28
B.	The NHS	29
IX	The Private Sector	32
A.	Utilities	33
B.	Major hazard sites	34
C.	Financial Services	35
1.	Banking	35
2.	Insurance	36
3.	Accounting	37
D.	SMEs and the supply chain	38
X	The Legal Situation	41
A.	Companies (Millennium Computer Compliance) Bill	42
B.	Year 2000 Conformity Standard	42
XI	Skills	44
XII	Future outlook	46
	Appendix A: Cabinet Group – Membership	47
	Appendix B: Ministerial Sub-Group on the Millennium Date Change	48
	Appendix C: Milestones	49
	Appendix D: Useful Contacts	51
	Appendix E: Further Reading	52

I Introduction

The onset of the year 2000 is eagerly anticipated around the world as a time for great celebration. However, although the forthcoming century date change is a certainty, in an ever-changing world, it is not an event that many of our computer systems were programmed to anticipate.

Many computer systems, programmes and electronically controlled equipment are unable to perform correct calculations involving dates which fall after 31 December 1999. This is mainly due to the common practice of using two digits to indicate the year e.g. 98 for 1998. Unless reprogrammed, bypassed or replaced these systems will malfunction at the turn of the century, if not before, with wide reaching consequences for industry, government, financial markets and many aspects of our everyday lives. The first warning of the problem was sounded by Bob Bemer, a programming expert working for IBM in 1979.¹ It has since been dubbed the “millennium bug” or Year 2000 computer problem and many people refer to the Y2K issue.

This paper explains what the millennium bug is and considers the range of operations that it affects both within the public and private sector. It also examines the action being taken by Governments and organisations both in the UK and around the world.

It is interesting to note that it is not only computer gadgets of the modern world which are not prepared for the new millennium. The oldest machine found to-date which cannot recognise the new century is 400 years old and currently housed in Liverpool museum. The instrument, known as an equatorium, predicts the positions of the planets but was designed only to function to the end of 1999.² An excusable design feature perhaps considering that at least two previous century-date changes were catered for.

¹ What's bugging you?, The Guardian, pg 8 (On line), 21.05.98

² 400 year old machine hit by 2000 bug, Daily Telegraph, pg 6, 05.06.98

II What is the Millennium Bug?

The Central Computer and Telecommunications Agency has called it the biggest crisis the information technology (IT) industry has ever faced.³

The House of Commons Science and Technology Committee report on the issue comments:⁴

The combination of the immutable deadline, the worldwide context and complex inter-dependencies makes managing the century date change “ a challenge without precedent”.

But what exactly is the millennium bug?

Since the early days of electronic computing, almost universally, only 2 digits have been used in computer systems to denote the year in date fields. For example, 1998 is denoted as 98. This practice was adopted to save expensive computer memory storage space and programming time. In the 60s and 70s, adding two century digits to a date field would have required storage space probably five times more expensive⁵ than that required for two - a cost difficult to justify when the general opinion was that most systems would be obsolete before the end of the century. As a result, in many applications the Year 2000 could be interpreted as 1900 because the computer is unable to distinguish between these years which would be both be denoted as 00.

An additional complication is that many older computer systems use old operating codes that were developed and modified without documentation. Consequently very few people have any idea how to reprogramme them!

³ Tackling the Year 2000: An executive overview, pg 4, CCTA, May 1997

⁴ HC 342 1997/98, The Year 2000 – Computer Compliance, Second Report of the House of Commons Science and Technology Committee, pgv, 01.04.98.

⁵ Ibid, pg 16

III What systems will be affected?

Any electronically controlled equipment with a date dependent element is likely to be affected including computer mainframes and those machines with embedded chips. (These are discussed below). Failure to recognise the century date-change could cause system failures, corruption of data, or shutdown.

Obvious signs of a date dependent system are those that:

- Display the current date
- Generate dated printouts
- Carry out specific functions on specific days
- Store information for averaging or trending purposes

Examples of the type of machines that could be affected include:⁶

- Personal computers
- Surveillance equipment
- Lighting systems
- Entry systems
- Barcode systems
- Clock-in machines
- Vending machines
- Dating equipment
- Switchboards
- Safes and time locks
- Lifts
- Faxes
- Vehicles
- Process monitoring systems
- Production line equipment

A. Embedded systems

There are many systems where susceptibility to the millennium bug is not immediately obvious. For example, microprocessors controlling lifts have date dependency in terms of timing and maintenance control. “Embedded systems” like this are very important. Embedded systems contain “programmed” instructions running via processor chips. Over the years, the production capability of chip manufacturers has become more sophisticated and the price of chip-based memory has fallen so microprocessors are now almost stand-alone computers buried inside other equipment.⁷

⁶ Action 2000, Millennium bug campaign brochure, February 1998

⁷ Sticky millennium challenge for oil, Scotland on Sunday, pg 5, 10.05.98

Research Paper 98/72

These microprocessors are programmable devices generally used to control or monitor things like machinery, environments, equipment and communications. They can be found in all personal computers (PCs) and perform control, protection and monitoring tasks in factories (drug and car manufacture), utility industries (water, gas and nuclear) and the home (washing machines, video recorders, alarm systems). They are used extensively to control and monitor engineering and manufacturing processes and therefore underpin the whole of the world's manufacturing and engineering base.

Embedded systems tend to consist of many layers of interacting systems and any one of these layers may have a millennium compliance problem. An example of an embedded system is navigation equipment which uses the Global Positioning System (GPS). This is a network of satellites orbiting the earth and transmitting position, date and time information to GPS receivers. These receivers may be handheld devices used by mountaineers to determine their location. These have date and time counters which will be unable to correctly recognise the Year 2000.⁸

There is also a particular concern in the oil sector which relies on "real time systems" which make use of the embedded chip technology.⁹ One oil operator has estimated that it has more than 40,000 microprocessors offshore.¹⁰ Real time systems have been used because the "time stamped" data can be used to generate reports on performance and for accurate financial monitoring of oil and gas supply. These systems may also perform safety functions such as fire and gas alarms on oil platforms, or emergency plant and machinery shutdowns as well as governing activities such as drilling, pumping and pressure and temperature control and monitoring.

In 1996, the number of embedded systems distributed worldwide was around 7 billion.¹¹ According to research conducted in 1997, around 5% of embedded systems were found to fail millennium compliance tests. More sophisticated embedded systems have had failure rates of between 50% and 80%. In manufacturing environments, Action 2000 reports that an overall failure of around 15% is typical.¹²

1. Personal Computers

During 1995, more than 200 million personal computers (PCs) were sold world-wide. Every PC has a mixture of clock and chips communicating with them (**basic input-output system – bios chip**) so individual testing is often necessary. IBM and Microsoft are amongst a range of

⁸ Embedded systems, A guide to evaluating how this problem could affect your business, Action 2000, Millennium bug campaign brochure, February 1998

⁹ Sticky millennium challenge for oil, Scotland on Sunday, pg 5, 10.05.98

¹⁰ Ibid

¹¹ Embedded systems, A guide to evaluating how this problem could affect your business, Action 2000, Millennium bug campaign brochure, February 1998

¹² Ibid

software companies offering a test program and some fixes are provided on their Web sites.¹³ The Windows operating system runs on about 90% of all personal computers and is generally millennium ready. Microsoft have admitted that two dozen of its products have problems with the millennium bug including the Windows 95 operating system. Although these are mainly minor issues, three older software programmes apparently have serious flaws. Windows 98, launched in June 1998 is designed to be millennium compliant.¹⁴ Businesses tend to replace their PCs every three years so are less likely to have a problem but schools and individual users are likely to be especially vulnerable.¹⁵

Many retailers are offering free upgrades for customers. For example, The Dixons Group which operates the Dixons, Currys and PC World Stores ensures that PCs available in their stores since May 1997 meet the BSI standard (see Chapter X). For those customers who have a problem with a PC bought before May 1997 Dixons provides a free bios upgrade or tries to get the manufacturer to provide one. The company also operate a millennium bug hotline and conducts free Year 2000 health checks whenever they visit a customer.¹⁶

This action is in line with that recommended for all systems by the House of Commons Science and Technology Committee in its recent report on Year 2000 millennium compliance:¹⁷

- (v) We do not accept that it is right to charge for upgrades necessitated by non-compliance of existing equipment. Depending upon the age of the current system and the terms under which it was supplied, companies have an obligation to provide suitable upgrades or replacements free of charge.

2. Building systems

All buildings built between 1984 (the year when building services started to computerise) and 1996/7 (the period when most new buildings were fitted with systems that were millennium compliant) are likely to be affected by the millennium bug.¹⁸ Bovis Construction Group, one of the biggest building contractors has written to the owners of 870 buildings it has built since 1984 warning them integral systems ranging from ventilation and heating to intruder alarms and connections to the electricity supply network may fail.¹⁹ This is because many building systems use microchips to identify dates for switching machinery on and off, and to alert maintenance staff to the need for servicing.

¹³ What's bugging you?, The Guardian (On line), 21.05.98

¹⁴ Microsoft bug-infested, Guardian, pg 25, 17.04.98

¹⁵ Information from Mrs Jane Wainwright, Director of Information (House of Commons Library), 29.06.98

¹⁶ Ibid

¹⁷ HC 342 1997/98, The Year 2000 – Computer Compliance, Second Report of the House of Commons Science and Technology Committee, pg vii, 01.04.98.

¹⁸ Energy and Environmental Management, pp 16-7, May/June 1998

¹⁹ Bovis warns of computer threat to buildings, Financial Times, pg 6, 06.06.98

IV What could go wrong?

The full consequences and chain reactions of system failures cannot be known until the millennium. It is very difficult to predict knock on effects of minor failures happening at the same time. There are some 20 billion embedded chips in use around the world as components in industrial process equipment, transport systems, hospital equipment, and domestic consumer goods. By the law of probabilities some are predicting that even if only a small percentage of these chips are left unaltered and only a few of these unaltered chips cause an incident, potentially around 20 Bhopal scale disasters could result around the world.²⁰

The most “doom and gloom” predictions foresee: planes tumbling from the sky, governments falling as national stability is threatened, runs on cash forcing banks to close as people anticipate problems with their accounts, all automatic doors refusing to open, industrial machinery automatically shutting down, no electricity or water supply and traffic lights going out of sequence causing crashes. In the event of such calamity, the UK will be relying on its contingency planning to save the day.

The British Computer Society provides the following typical examples of likely problems:

- Bills not paid
- Older stock never being used because it appears to be younger than newer stock or newer stock being scrapped because it appears to be past its use-by date
(Marks and Spencer came close to destroying a consignment of corned beef dated to expire in 2005, when their computer system read the date as 1905).
- Incorrect interest calculations on deposits and loans
- Future scheduled actions never getting triggered e.g. subscription renewals, vaccination recalls, warranty expiry notices or any other “due” date events.

Some credit card expiry dates are already failing and systems with forecasting applications used to anticipate future trends or stock control systems monitoring sell by dates are already vulnerable.

A. Economic Impacts

The worldwide cost of fixing the millennium bug problem has been estimated to be as much as £400bn.²¹ There are some concerns that the problem could trigger a world recession as economies slow down with companies diverting resources to cope with computer

²⁰ BBC 2 “Disaster” Series, 09.06.98

²¹ Year 2000 brought to book, Independent, pg 22, 05.03.98

breakdowns. Leo Doyle, an economist at Dresdner Kleinwort Benson has studied millennium bug spending patterns and has estimated that even modest knock on effects of the bug are likely to slow economic growth by between 0.5 and 2%. He estimates that spending on computer experts to tackle the bug is boosting economic growth by around 0.25 % this year. This is expected to accelerate next year, but collapse in 2000 and 2001 after most of the problems are solved. Doyle anticipates the main economic effects will come from the disruption to industry. He predicts that even if only 15% of UK plant and machinery is hit by the millennium bug and 80% of those bugs are solved, economic output will still be reduced by more than 2%. Mainland Europe could be hit twice as hard as the UK and the outlook is even worse in Japan. Analysts from the Gartner Group predict that in Western Europe the Year 2000 bug will cause 8% of all companies to fail. In some cases that will be because they have not sorted out their own systems, in others it will be because they were dependent on another company who did not have its systems in order.²²

²² BBC 2 "Disaster" series, 09.06.98

V Government Action

The Prime Minister, Tony Blair has said that the millennium bug is “one of the most serious problems facing not only British business but the global economy today”.²³ Over recent months the Prime Minister has personally taken a lead in raising the profile of the issue. This step has been very much welcomed by businesses, many of whom felt that previously the issue was not being given the Government attention or resources which it deserved.

Government action on the millennium computer problem has shifted its focus from initial awareness raising to providing practical support to organisations seeking solutions to the problem. The key players in the Government programme are set out below.

A. Ministers and Government Departments

The Secretary of State for Trade and Industry has responsibility for developing awareness activities to ensure that private companies are prepared for the millennium bug. She also has sponsorship responsibility for a number of related sectors, including the software and communications and many of the privatised utilities sectors.²⁴

All Departments of Central Government are individually responsible for ensuring that their own systems are millennium compliant. They are also responsible for ensuring that organisations in the wider public service sectors that they sponsor have the necessary guidance and information. The Chancellor of the Duchy of Lancaster, Dr David Clark (Office of Public Service) co-ordinates millennium compliance activity in Central Government, assesses progress and provides guidance. He has no authority to compel central Government departments or agencies to take action, but has the “tools of publicity and persuasion at his disposal.”²⁵

The Central Information Technology Unit (**CITU**) of the Office of Public Service and the **CCTA** (Central Computer and Telecommunications Agency) have a monitoring, advisory and co-ordination role, and the CITU provides policy advice to Ministers. The CITU monitoring role has recently been extended to cover the full public sector and a risk assessment across essential services in the national infrastructure. Both the CITU and CCTA have played a part in raising awareness of the problem. They have issued guidance to departments and agencies (available publicly) and set a timescale for action.²⁶

²³ Millennium Bug Campaign Information Booklet, Action 2000

²⁴ Explanatory memorandum on European Community Document, COM (98) 102 final, submitted by the DTI, on 21.04.98

²⁵ HC 342, 1997/98, The year 2000 – Computer Compliance, Second Report of the House of Commons Science and Technology Committee, para 20, pg xiv, 01.04.98

²⁶ Managing the Millennium Threat II, National Audit Office, pg 4, para 9, 15.05.98

1. Ministerial Group (MISC 4)

The Secretary of State for Trade and Industry chairs a Ministerial Group to drive forward action to tackle the Year 2000 problem across the public and private sectors. It looks at key sectors of the nation's infrastructure and undertakes any necessary contingency planning. It had its first meeting in January.²⁷ A ministerial sub-group chaired by Dr David Clark looks at the effects on Government business of the millennium bug and reports to the Ministerial Group. The membership of these groups is set out in Appendices A and B. In March 1998, the remit of the Ministerial sub-group on the millennium Date Change was widened to cover the whole of the public sector as well as government departments.

2. Year 2000 Team

In March this year, a new Year 2000 team was established in the Central Information Technology Unit in the Office of Public Service. The team of 10 is made up of staff seconded from Government departments who will "chase" progress and help to spread best practice across Government departments and the wider public sector. The new team is also managing a study undertaken by Ernst and Young which will initially define and map those processes that are key to the maintenance of essential public services in the United Kingdom, including those run by private sector companies,²⁸ e.g. electricity, telecommunications, gas, water and food supply. The team will report directly to both the President of the Board of Trade and the Chancellor of the Duchy of Lancaster.²⁹

B. Action 2000 and Taskforce 2000

Action 2000 is the government agency charged with making an assessment of the state of preparedness of UK business to cope with the millennium bug, and developing and implementing programmes to encourage business to make suitable preparations. Its creation was announced at the end of September 1997.

Action 2000 replaced Taskforce 2000 as the Government-funded body promoting action in the private sector. Taskforce 2000 was set up in August 1996 by the previous Government to promote awareness of the issue amongst senior decision-makers in industry and commerce. Taskforce 2000, was established as a not for profit organisation, partly funded by private companies, but mostly by the DTI. Although Taskforce 2000 did much to increase levels of awareness as it intended there were concerns that more needed to be done to turn these concerns into action. The DTI therefore launched Action 2000 and announced that DTI funding for Taskforce 2000 would cease on 31 March 1998 or when the £350,000 DTI

²⁷ Millennium bug fears prompt Blair to call for contingency plans, *The Independent*, 23.01.98

²⁸ HC Debate, col 702, 06.05.98

²⁹ Year 2000 team set up to drive millennium bug action, Cabinet Office news release cab 90/98, 31.03.98

Research Paper 98/72

funding had been spent, whichever was sooner.³⁰ Taskforce 2000 now continues to raise awareness on the date change issue, but with private sector funding.

Action 2000 has been set up as an independent company and its chairman is Don Cruickshank, (previously Director General of OfTel, the telecoms regulator). He has been appointed until 31 March 2000 in recognition that after 1 January 2000 there are likely to be some businesses who have failed to act in time or whose actions have not proved to be completely successful.³¹ The day-to-day operations of the company are the responsibility of the Director Gwynneth Flower, who is aided by three team leaders and clerical and administrative support.³²

In its first month of operation the Action 2000 hotline received approximately 3,600 calls.³³ Action 2000 launched an information pack earlier this year designed to help businesses understand the scale of the problem and to suggest solutions to suit different size companies. There is also an Action 2000 web site at www.open.gov.uk/bug2000.htm and a hotline (Tel: 0845 601 2000). The hotline provides advice on good practice, case study material and information on training. As of February 1998, there were 6 staff permanently assigned to the hotline with 3 more available to cope with peak demands. Action 2000 is keeping performance under review and will consider expanding resources if necessary.³⁴

Action 2000 was originally allocated a £1 million budget on establishment last year. This budget was widely felt to be inadequate to tackle the problem and the Prime Minister announced in March that the budget would be increased to £17 million.

C. Contingency plans

Mr Blair has said that the millennium computer bug problem might have to be treated as a civil emergency from the end of next year.³⁵ He has asked strategic industries and government departments to draw up contingency plans in the event that the millennium computer problem has not been eradicated from the nation's computer systems by 31 December 1999. The contingency plans will cover key sectors of the economy such as: telecoms, financial services, electricity generation, transport and broadcasting. They will also include Whitehall departments particularly those responsible for large budgets and the payment of benefits.³⁶

³⁰ HC 342, 199798, The year 2000 – Computer Compliance, Second Report of the House of Commons Science and Technology Committee, pg xvi, para 30, 01.04.98

³¹ HC Deb cols 109-10W, 24.03.98

³² HC Deb, col 397W, 393W, 19.01.98

³³ HC Deb, col 71 W, 09.03.98

³⁴ HC Deb, col510W, 16.02.98

³⁵ Millennium bug crisis could trigger national emergency, The Independent, pg 2, 31.03.98

³⁶ Millennium bug fear prompt Blair to call for contingency plans, The Independent, pg 20, 23.01.98

The recognition of the seriousness of this issue was welcomed by the National Audit Office (NAO) who are concerned that over half of the bodies they have examined have yet to develop contingency plans for what they will do if their modified systems do not work.³⁷

Most accept that it is too late to solve the problem completely. Therefore it is widely agreed that the best course of action is to focus on the most important systems and prepare contingency plans to cope with unexpected failures.

In March 1998, Gwynneth Flower, Director of Action 2000 commented that:³⁸

“We are too late to have a totally trouble free transition to the new millennium. The millennium is a problem that will affect every man, woman and child in the world. We must prioritise our actions to make sure that the most vital computer systems are fixed and leave the rest for later.”

D. Training

In this year's Budget, the Government allocated £70 million to help small and medium sized businesses develop their IT skills to assess and fix systems which will be affected by the bug. This issue is discussed in more detail in Chapter XI which looks at the IT skills shortage.

³⁷.Managing the Millennium Threat II, National Audit Office, pg 6, 15.05.98

³⁸ It's too late to halt millennium bug say experts, *The Independent*, pg 6, 27.03.98

VI International Action

The world's computer systems are inextricably linked, and therefore it is important that all nations play their part in tackling the problem, otherwise, the more aware nations will still be at risk. There is general recognition that the four nations in which progress on Year 2000 remediation efforts are most advanced, are; Australia, The United States of America, Canada and the UK.

The UK has been seeking to raise awareness of the problem both in Europe and internationally. The Government has put £10m into a World Bank Trust Fund to provide experts on training to developing countries, in the hope that other Western nations will follow the lead.³⁹ In recent surveys, only 37 out of 128 countries borrowing from the World Bank said they were aware of the problem and only 6 had set up awareness raising campaign organisations.⁴⁰ Areas like Indonesia and Brazil, where there has been an explosion in IT usage in the last 6 years are likely to be hit very badly, as they do not have the skills base to tackle the problem.⁴¹

The UK has identified five priority areas where international connections are particularly important:⁴²

- Power
- Telecommunications
- Finance
- Defence
- Transport

A. Europe

1. Commission Communication

In February 1998 the European Commission introduced a Communication concerning "The Year 2000 Computer Problem"⁴³ at the Telecoms Council. It was also presented to the Internal Market Council and the EU Industry Council.

The Communication describes the nature and importance of the Year 2000 software problem. It outlines the potential impact of the problem on consumers, competitiveness (especially among SMEs), and the operations of infrastructure and public administration. It concludes

³⁹ Blair to hire 20,00 for millennium bug army, *The Independent*, pg 1, 30.03.98

⁴⁰ *ibid*

⁴¹ Millennium bomb futures, *Financial Times*, pg 8, weekend 04/05 April 1998.

⁴² PM's measures to neutralise computer bomb are welcomed, *Financial Times*, pg 13, 31.03.98

⁴³ Communication 6461/98, *The Year 2000 Computer Problem*, 3 March 1998

by considering the scope for Community action, but it is not a proposal for legislation. The Government strongly supports the arguments in the Communication.⁴⁴

The Communication argues that awareness of the problem across the EU is increasing too slowly, although it notes that preparedness and progress differ across Member States. The Commission is not proposing to require Member States to take particular action. It has made it clear that it feels that public administrations must ensure compliance of their own IT systems and they may co-operate with the private sector to raise awareness of the issue and stimulate action. It also advocates collaboration between Member States' initiatives.

There are a range of awareness campaigns and taskforces in other Member States and these tend to be jointly sponsored by central or local governments, with representatives of local governments and representatives of the private sector (such as employer's federations or chambers of commerce).⁴⁵

Examples of EU initiatives include:

- Millennium Platform (Netherlands)
- Year 2000 Action Plan (Denmark)
- Forum 2000 (Belgium)
- IT Commission (Switzerland)

2. EU Conference

On 9 May 1998, the DTI organised a conference on the millennium bug in London as part of the UK's drive to raise awareness of the problem internationally, making the most of this year's presidency of the European Council of Ministers and the G8. The event was chaired by Don Cruickshank from Action 2000 and delegates included bug and strategic planning experts from all Member States, and where applicable members of national campaigns to tackle the problem e.g. Action 2000 and the Dutch Millennium Platform.

The aims of the conference were to:⁴⁶

- Provide a forum for EU Member States to share information about existing campaigns and programmes to reduce the impact of the Millennium bug.
- Urge those Member States who have not already done so to set up their own national campaigns to highlight the threat posed by the bug.

⁴⁴ Explanatory memorandum on European Community Document, COM (98) 102 final, submitted by the DTI, on 21.04.98

⁴⁵ The Year 2000 Computer Problem, COM (1998) 102 final, Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the regions, 25.02.1998

⁴⁶ Roche chairs Telecoms Council: Announces EU conference to tackle millennium bug, DTI, P/98/145, 26.02.98

Research Paper 98/72

- Exchange best practice on promoting awareness of the bug and converting awareness into action
- Identify the key EU cross-border issues raised by the bug and ways of tackling them.

EU Public Administration Ministers have since agreed to review progress at their next meeting in Vienna, and to exchange information on the action that governments are taking to help ensure continuity of operations in public and private sectors. Dr David Clark, has been invited to take the lead, and has submitted the UK's contribution to the exercise to his European colleagues.⁴⁷

B. G8 Summit

It is estimated that the millennium computer bug problem could knock 2% off the national income of all G8 countries in the year 2000, provoking a £250 billion global recession. Recognising the seriousness of this threat, the issue of the "bug" was on the formal agenda of the G8 summit in Birmingham in May.⁴⁸ The following statement was made in the final communiqué.⁴⁹

25. The Year 2000 (or Millennium) Bug problem, deriving from the way computers deal with the change to the Year 2000, presents major challenges to the international community, with vast implications, in particular in the defence, transport, telecommunications, financial services, energy and environmental sectors, and we noted the vital dependence of some sectors on others. We agreed to take further urgent action and to share information, among ourselves and with others, that will assist in preventing disruption in the near and longer term. We shall work closely with business and organisations working in those sectors, who will bear much of the responsibility to address the problem. We will work together in international organisations, such as the World Bank to assist developing countries, and the OECD, to help solve this critical technological problem and prepare for the Year 2000.

A meeting in Moscow will co-ordinate the action plans of the G8.⁵⁰

C. Case Studies

1. America

America generally has been reported to be well ahead of the game on the millennium bug and certainly ahead of other nations. However, leading congressmen and industry analysts recently urged the White House to take a more active role in combating the millennium bug. A congressional sub-committee on government management has produced a graded assessment of steps already taken by 34 federal agencies to solve the problem. The

⁴⁷ HC Deb, cols 717-718, 08.06.98

⁴⁸ Millennium bug: Blair goes to war, *The Independent*, pg 1, 9.02.98

⁴⁹ The Birmingham Summit, Final Communiqué, Sunday 17 May 1998, <http://birmingham.g8summit.gov/uk/docs/final.shtml>.

⁵⁰ Fears of economic crash shrugged off as countries plan "millennium bug" meeting to avert worldwide computer chaos, *The Guardian*, pg 7, 18.05.98.

Committee has warned that at least six federal agencies, including the Defence and Transportation departments, are unlikely to fix their computer systems in time.

Stephen Horn, chairman of the committee has said “ It is time for the President to provide a wake-up call and designate the Year 2000 problem as a national priority”.⁵¹

There is no single entity within the US government with the authority or responsibility to take an overall leadership position on the issue. Instead, a wide range of public, private and quasi-public organisations and agencies are assuming responsibility within their particular domains. On the business side, the Information Technology Association of America (ITAA) has been working hard to attract attention to the issue since 1995, whilst public-sector leadership on the issue has come primarily from Congress. Several congressional bodies have held hearings on a broad range of Year 2000 matters and their implications for government and public services. As a result of these hearings, several pieces of legislation have been proposed. Bills currently under consideration include:⁵²

- Millennium Act

This aims to assure the integrity of information, transportation and telecommunications upon the arrival of the Year 2000 (introduced 24.09.97)

- Commission on the Year 2000 Computer Problem Act

This seeks to establish a bipartisan national commission to address the Year 2000 computer problem. (Introduced on 21.01.97)

- Millennium Computer Act of 1997

This would require the head of each federal agency to ensure that the computer systems of the agency are capable of performing their functions after December 31, 1999. (Introduced 20.03.97)

2. Canada⁵³

The Canadian government has been outspoken on its plans to take care of its own departmental computer problems and is making moves in warning the private sector that the problem is important to address. Industry Canada (Canada's DTI equivalent) has set up Taskforce 2000 to assess the state of Canadian Year 2000 private sector preparedness, and to

⁵¹ Action on Year 2000 urged, Financial Times, pg 6, 03.06.98

⁵² International Response to the Millennium Date Change Problem, Section - International Overview - The Leaders, Task Force Year 2000 (Canada), 28.01.98

⁵³ Canada (Update), Joe Boivin, Westergaard Year 2000 International Watch, 24.04.98 at www.y2ktimebomb.com

Research Paper 98/72

provide advice on actions needed to address this issue. The Taskforce is made up of a small group of senior executives from firms in Canada's key economic sectors. The Government of Canada's Chief Information Officer serves as an ex-officio member to facilitate the exchange of information between the private and public sectors.⁵⁴ The Taskforce reported to the Government in February 1998, and confirmed that all sectors of the Canadian economy had a long way to go to be prepared for the century date change.⁵⁵

In March 1998, the Government of Canada announced a federal government "freeze" on non-Year 2000 initiatives. Canada is the first country in the world to do this. This allows all possible resources to be concentrated on Year 2000 problems. At the same time, the Government made the Year 2000 problem its top priority. The same approach has also been used in the Netherlands and Australia. The focus will be on fixing the 42 mission-critical computer systems the government considers "critical to the health, safety and economic well being of Canadians". The Canadian House of Commons Industry Committee has been taking evidence on the matter and is keen to get the Government to step up its Year 2000 campaign.

Officially, \$1billion (Canadian) has been announced as the cost of fixing the Canadian government's critical systems and it is estimated that about 45% of the government's systems have been fixed (mission-critical systems only). To help pay for the repairs, the Finance department has set up a special loan fund allowing departments to borrow from their future technology budgets. Flexible repayment schedules have been set up so departments will not be forced to reduce services to Canadians or lay off workers to pay back their loans.

Provincial and municipal governments all over Canada are slowly releasing information regarding their status. Most of it is quite negative. The same goes for the private sector as only 40-50% of companies surveyed by Statistics Canada have taken steps to address the Year 2000 problem.

3. Asia

The Financial Times recently reported that phone companies in most Far Eastern and Middle Eastern countries do not appear to have spent anything on the problem and awareness of the problem is low to non-existent. This seems to be true for other critical sectors such as: water, electricity, oil, chemicals, banking, food distribution and healthcare. Hardly any large Asian or Arab organisations outside Hong Kong and Singapore have made adequate provision or any provision at all.⁵⁶

⁵⁴ Year 2000 industry Canada Task Force Mandate, Taskforce 2000, 08.06.98

⁵⁵ Business leaders signal SOS on Year 2000: Economic Outlook "At Risk", Task Force Year 2000 News release, 03.04.98

⁵⁶ Some countries infrastructures vulnerable to millennium bomb, Financial Times, pg 20, 08.04.98

An industry commentator in Dubai recently reported that:⁵⁷

Most small- and medium-sized businesses in the United Arab Emirates still have yet to grasp what this problem is all about. Press has been complacent. A few IT companies with American and European connections as well as some international banks and multinationals have only now taken the lead to increase Y2K awareness among businesses.

.....Most international banks & multinationals of American and European origin, which are operating in UAE are aware of the Y2K Problem and may be taking adequate action. However, there is no public disclosure by them about their Y2K compliance status. On 20th May 1998, British Bank organised a seminar to increase awareness of Y2K. Early next month, Unilever Arabia is organising a conference where some top government officials and some known IT consultants are expected to participate.

There has been very little written on this subject in the local dailies. The awareness among most UAE citizens is near zero. Many of those aware of Y2K believe that this lack of public awareness is due to the fact that most government entities, including the government controlled telecommunications company, the electricity and water authorities, the Dubai Ports Authority, and the Airport Authority will be on time with Y2K compliance. This expectation is based upon the fact that these companies have proven high standards of performance and far sightedness. The need for public disclosure has not been felt because of these entities' confidence.

Almost all oil companies are big and use the latest technology. It is not publicly known whether these companies are already compliant or whether they are working on compliance. Oil transportation certainly depends upon shipping and the interdependence of the oil industry and shipping is a matter worth consideration.

⁵⁷ Y2K In Arab Lands: Complacency leads to Panic, Sunil Madhock for Westergaard Year 2000 International Watch, 05.06.98 at www.y2ktimebomb.com/IW/AK/iw9822.htm

VII How can the problem be fixed?

There are a variety of products on the market to aid millennium compliance and Action 2000 has now developed a Year 2000 Support Centre Web site with links to tool kits and information resources (www.support2000.com). There are many software programs available offering to test and fix the Year 2000 problem on computers and software packages. These test-software programs test computer clocks by emulating the roll-over to the next century. Fix software makes any necessary adjustments to the clocks so that, when the century change actually occurs, the computer recognises the date correctly. However, even if the computer is Year 2000 compliant, the software applications on it can still experience problems. 'Audit' software should be able to detect any software problems, but works to varying degrees. Some provide a detailed analysis of the problems while others supply only contact numbers. Which? Magazine has recently produced a best Buy Guide on *Software solutions to the Year 2000 problem for home computers*.⁵⁸

Action 2000 suggests the following basic course of action for those seeking to address the millennium bug problem in their systems:

- **Understand the problem**

Organisations should create an inventory of all computer and electronic systems, including any equipment that might be affected like heating control systems, electronic alarms, telephones, faxes and entry mechanisms. They should also examine supply chains and draw up lists of those organisations on which their operations depend. By estimating the scale of the problem companies are better able to allocate the necessary resources to complete the work.

- **Prioritise**

It is important to prioritise systems and equipment that are business critical. The organisation needs to determine whether it can survive their failure, i.e. is it essential to the day to day running of the operation or merely a useful tool?

- **Assess**

The next step is to assess the extent to which the millennium bug affects the items on the inventory. This is essential and must be undertaken before deciding how to proceed. This can be done by contacting suppliers and older systems can virtually be assumed to be non-compliant, although this does not mean that they will become unusable.

⁵⁸ Which? November 1997

- **Plan and Implement**

Firms may carry out the work in-house or hire specialists. If there is a problem with a system the options are:

- To replace it with a Millennium compliant system (in some cases the software is permanently stored on a chip within the system itself, and cannot be altered).
- Rewrite or modify the system to cope with the date change
- Retain the system on the basis that it can cope with the date change
- Retire the system if it is not essential to the business

Organisations will also have to consider network links. So that healthy areas are not affected by sections of the system still needing attention. Also if millennium compliance techniques are not consistent across systems in a networked environment. Every application program that uses the two digit data and every application program that stores or references this data must be changed.

- **Test**

This is the most time consuming part of a millennium bug programme accounting for 50 – 70% of the effort. Equipment and computer systems have to be thoroughly checked to ensure that they will work correctly before, during and after the change in century and that they recognise that the Year 2000 is a leap year.

For some industries there may be limited opportunities for testing. For example, for the oil industry, testing can only be done during a shutdown of the offshore platform which does not occur under normal circumstances more than once every two years. Platforms in the North Sea therefore may only have one scheduled shutdown before 2000.⁵⁹ In the House of Commons Library Department some systems will be tested during this summer recess. Systems known to be non-compliant will be disconnected and millennium compliant systems tested by changing clock settings to mimic the century date change.⁶⁰

- **Install**

Organisations need to be aware that staff training may be required to work with any new systems.

⁵⁹ Sticky millennium challenge for oil, Scotland on Sunday, pg 5, 10.05.98

⁶⁰ Information from Mrs Jane Wainwright, Director of Information Services (House of Commons Library), 29.06.98

VIII Public Sector

The Prime Minister has said that the estimated cost of dealing with problem across the public sector stands at £3bn.⁶¹ The total cost estimate for dealing with the millennium bug in Government departments is currently estimated at £402m⁶² (an increase of 8% on the original £370m estimated in the first progress report).⁶³ This estimate has risen with every progress report as Departments have firmed up their estimates. In a recent report, the National Audit Office notes the rising estimates in its recent report and comments that “some plans are still incomplete in scope or cost and we consider there is a risk of the overall cost estimates rising again.”⁶⁴

The Office of Public Service’s timetable for action has been:⁶⁵

- January 1997:** All departments to have completed an audit of their information systems for Year 2000 compliance.
- October 1997:** All Departments to have prepared a prioritised, costed and timed programme of action.
- January 1999:** All Departments to have tested all modified systems except for financial systems where testing should have been completed after the end of the financial year, i.e. April 1999.

Dr David Clark (Chancellor of the Duchy of Lancaster, Public Service Office) made the first major statement to the House reporting on Government progress towards tackling the millennium computer problem in November 1997. He announced that he would review progress on tackling the problem within Central Government on a quarterly basis and make a statement to the House⁶⁶. The first monitoring questionnaires were sent to all departments and agencies in February 1998 and completed questionnaires and a summary have been placed in the Library and on the Government’s Internet site at <http://www.open.gov.uk/citu/cituhome>. The second and latest progress report was provided on 8 June 1998.⁶⁷

The National Audit Office (NAO) produced a report on Managing the Millennium threat in May 1997, a second report was produced in May 1998 updating progress across the central

⁶¹ Blair to hire 20,000 for millennium bug army, *The Independent*, pg1, 30.03.98

⁶² HC Deb, col 716, 08.06.98

⁶³ Ibid

⁶⁴ Managing the Millennium Threat II, Report by the Comptroller and Auditor General, National Audit Office, pg 6, 15.05.98

⁶⁵ Managing the Millennium Threat II, pg 4, National Audit Office, 15.05.98

⁶⁶ Government reports on action to tackle millennium bug, Office of Public Service News Release, CAB 145/97, 27.11.97

⁶⁷ HC Deb, cols716-727, 08.06.98

government sector and describing in more detail how the Department of Social Security and the National Health Service are tackling the problem.

Initial plans from departments were criticised for not mentioning work on equipment with embedded microprocessors, although by March 1998 all, but a few bodies had plans covering non-IT systems.⁶⁸ The NAO felt that departments had been slow to address the risks of failure in their supply chain and remains concerned that over half of the bodies they examined had not yet developed contingency plans in case their modified systems did not work.⁶⁹

In his latest report the Minister commented:

“Most of the returns show progress in correcting business critical IT systems. A few show dates uncomfortably close to the end of 1999, though they do not involve organisations that provide services direct to the public. The overall target dates and the completion dates for non-critical systems have moved by a larger margin. There are still cases where testing seems to have started without a sufficiently defined strategy and some plans still contain too little information about embedded systems and telecommunications systems.

A majority of the returns indicated that departments and agencies feel they have adequate skills to undertake the work, although there is heavy reliance on outsourcing and consultants”.

The latest NAO report comments that:

It is too soon to say whether departments will meet the dates of January and April 1999 for testing modified systems. Overall departments and agencies claim that they have the necessary skilled resources available in house or from existing suppliers of contracted out services, but there is a risk that as more detailed work is done, revealing the need for additional skilled staff, sufficient staff will not be available, or costs will rise as departments and agencies find they have to pay premium rates. Already the Ministry of Defence has signalled their concerns about emerging staff shortages.⁷⁰

Although all departments have now completed their stock take of information systems, the National Audit Office reports that:⁷¹

Our examination of the progress reports suggests that not all departments and agencies have yet identified the full extent of the millennium threat, fully assessed the risks involved and prioritised work needed to manage these tasks.

The variable content of the plans and in some cases, lack of detail, make it difficult to assess the realism of the targets. There are indications that some departments are already planning completion dates after January 1999 and others already foresee slippage. Many departments are setting a range of target dates, differentiating between business-critical and non-critical systems.

⁶⁸ Managing the Millennium Threat II, pg 6, National Audit Office, 15.05.98

⁶⁹ Ibid

⁷⁰ Ibid

⁷¹ Ibid, pg 5

Research Paper 98/72

However, in relation to the Department of Social Security, the NAO had a more positive message commenting that the DSS's programme was "well structured" and their approach to project management complied with best practice recommended by CCTA⁷².

No information is held centrally on the readiness of bodies in the wider public sector, for example the 1,100 non-departmental public bodies or local authorities. David Clark has acknowledged this problem and is encouraging all non-departmental public bodies, organisations and other bodies in the wider public sector to publish their plans for millennium compliance.⁷³ He has also stated that he believes that Members of Parliament have a responsibility to persuade bodies in their constituencies that are not directly responsible to the House to follow a sensible and open approach.⁷⁴

A. Local Authorities

The millennium bug raises the possibility of serious disruption to essential services such as benefit payments or even emergency services such as hospitals, the fire service and the police. John Prescott and the Chairman of the Local Government Association have written to every local authority leader and chief executive asking them to set up their own taskforce and to raise awareness on their own local areas and to co-ordinate action between the public and private sectors.

Each local authority is responsible for ensuring its own millennium compliance. Authorities have access to advice on this issue through the Local Government Management Board and the professional body of local government IT officers. (the Society of Information Technology Management – SOCITM).⁷⁵ The Local Government Association (LGA) has estimated that local authority preparations for millennium compliance will cost £500 million. This involves spending at least £100 million in 1998-9.⁷⁶

The House of Commons Science and Technology Committee report on the Year 2000 problem recommends that the Government should ensure that financial constraints do not prevent the public sector achieving millennium readiness especially where safety critical systems are involved.⁷⁷ However, in a recent debate on the millennium bug, Dr Clark stated:

On finance, we, like the previous Government, made it clear to health authorities, local authorities and all public sector bodies that the problem had to be addressed. We assured them that the problem existed and insisted that they made sure that their budgets took account of it, so there is no reason why extra money should be needed.⁷⁸

⁷² Managing the Millennium Threat II, pg 55, National Audit Office, 15.05.98

⁷³ HC Deb, col 717, 08.06.98

⁷⁴ HC Deb, col 721, 08.06.98

⁷⁵ HoC Deb, col 118WA, 10.02.98

⁷⁶ HC Deb, col 12, 26.01.98

⁷⁷ HC 342, 1997/98, The Year 2000 – Computer Compliance, Second Report of the House of Commons Science and Technology Committee, pg vi, 01.04.98

⁷⁸ HC Deb, col 330, 17.06.98

One area where there is particular concern regarding preparedness and funding is the National Health Service.

B. The NHS

The Chief Executive of the NHS has described millennium compliance as the “highest non-clinical priority in the NHS”.⁷⁹ Recent estimates provided to the NHS Executive by health authorities and trusts indicate Year 2000 costs of approximately £330 million.⁸⁰ The NAO has estimated that the cost to the whole NHS may be in the order of £230 million (at least £170 million for NHS Trusts and at least another £60 million for GPs). However, the NAO cautions that this is at the lower end of the range of costs for similar sized organisations which, if applied to the NHS, would suggest costs between £200 million and £850 million.⁸¹ To put this in perspective, the NHS currently spends around £200 million each year on IT and over £100m buying medical and surgical equipment.⁸²

Much NHS medical equipment such as life-support equipment depends on date-sensitive built-in computers, as do patient administration systems which schedule operations, bed allocation and re-ordering of medical supplies.⁸³ The NHS also has to prepare for the possibility that there could be an increase in demand for its services if people are harmed by Year 2000 related failures in other organisations.

However, despite the clear importance attached to the problem, the Audit Commission’s mid term report on the progress made by authorities and trusts has generated concern, making it clear that services may be at risk because these bodies are generally behind schedule with their Year 2000 projects. The report states:⁸⁴

It is unlikely, in our opinion, that the target date of 31 December 1998 (required by the NHS Executive for NHS organisations; advisable for local government) for completion will be met.

Dr Clark has also expressed concern at the report’s findings:

“The warnings are chilling and we cannot run away from them. I intend to publicise the report and to tell local authorities and NHS trusts that they must address the problem with much more urgency”.⁸⁵

⁷⁹ Look ahead for guidance, Financial Times, pg 246.1.98

⁸⁰ A Stitch in Time: Facing the challenge of the year 2000 date change, Audit Commission (Management Paper), 15.06.98

⁸¹ Managing the Millennium Threat II, pg 8, National Audit Office, 15.05.98

⁸² Ibid

⁸³ Chips with everything 1999: Millennium Time Bomb Part 2: The ubiquitous microchip is infected by the millennium bug. Robert Uhlig identifies its many potential victims, The Daily Telegraph, 02.01.98

⁸⁴ A Stitch in Time: Facing the challenge of the year 2000 date change, pg 34, Audit Commission (Management Paper), 15.06.98

⁸⁵ HC Deb, col 327, 17.06.98

Research Paper 98/72

However, he was also quick to point out that the report concludes that

“The problems are not insurmountable but urgent action does need to be taken”

This was not the first warning. In December 1997 Professor Mike Smith of St Bartholomew’s Hospital, London prepared a report on the current efforts of the NHS to become 2000-compliant.⁸⁶ Professor. Smith felt that the Government was being 'astonishingly complacent' or 'showing a total misunderstanding' of the effects on the health service. He predicted that 3 million patients are likely to be affected and up to 1,500 deaths could result which could result in personal, civil or criminal liability claims. Such claims could involve: trust directors and managers, doctors, nurses and paramedics.⁸⁷

The NHS Executive described these warnings as “alarmist and unjustified”⁸⁸ at the time and in their evidence to the House of Commons Science and Technology Committee stated that in one trust, they had identified and inventoried some 7,000 pieces of medical equipment of which they believed only 200 had a true date time function.⁸⁹

The NHS started addressing the issue as early as May 1996 when a small project team was set up to assess the impact of the millennium threat, and to raise awareness of the issue. However, it seems that a lack of central co-ordination in key areas was leading to duplication of effort at the local level and in 1997 a more structured approach emerged with targets set and clear accountability and monitoring mechanisms put in place. For example the Medical Devices Agency has now requested all suppliers to identify which of their products may be susceptible to problems and NHS Regional Offices are now considering ways in which effective testing might be conducted on a regional basis.⁹⁰ Help and advice for trusts and health authorities is now available from the NHS Executive Year 2000 team who have provided a website (www.imc.exec.nhs.uk/2000) to support all NHS Organisations and their Year 2000 programmes.

However, despite this improved approach the Audit Commission’s report highlights that opportunities exist to improve the co-ordination of effort and co-operation between authorities and trusts, including dissemination of ideas, good practice and compliance status information.⁹¹

⁸⁶ Patients at risk as NHS fights millennium bug, The Observer, pg14 December 1997

⁸⁷ Business: Patients at risk as NHS fights millennium bug: Management: Hard-up hospitals face a grim choice between treating the sick and eradicating the year 2000 computer glitch, pg 7, Observer, 14.12.97

⁸⁸ NHS millennium fix goes on critical list, Computer Weekly, 18.12.98

⁸⁹ HC 342 1997/98, The Year 2000 – Computer Compliance, Second Report of the House of Commons Science and Technology Committee, pg xxii, para 51, 01.04.98

⁹⁰ Ibid para 50, pg xxii

⁹¹ A Stitch in Time: Facing the challenge of the year 2000 date change, pg 6, Audit Commission (Management Paper), 15.06.98

The NAO also reported on Year 2000 compliance in the NHS and noted that the single largest area of concern raised by authorities and trusts was the difficulty anticipated in providing adequate resources.⁹²

The House of Commons Select Committee commented:

(r) We remain concerned that progress in the National Health Service compared with other parts of the public sector appears slow: for instance, trusts were not required to provide full costings for readiness programmes until 31st March 1998 whereas central Government departments and agencies provided costings 6 months earlier. It is essential to guarantee that the National Health Service is fully prepared to manage the century date change.⁹³

The NAO report recommends that the NHS Executive continues to monitor progress very closely and consider the need for further selective direct intervention where there is a risk of failing to achieve compliance or inadequate contingency planning. The NAO also recommends that the Executive reviews the need for further investment of resources in Year 2000 projects in the light of progress reports from NHS Trusts and Health Authorities⁹⁴.

⁹² Managing the Millennium Threat II, pg 6, National Audit Office, 15.05.98

⁹³ HC 342 1997/98, The Year 2000 – Computer Compliance, Second Report of the House of Commons Science and Technology Committee, pg vi, 01.04.98

⁹⁴ Managing the Millennium Threat II, pg 26, National Audit Office, 15.05.98

IX The Private Sector

“Responsible firms need to convert their awareness of the Millennium bug into decisive action. Those firms that sort out the problem now will be one step ahead of their competitors. Those that don’t will be handing them business”

(Action 2000 Millennium Bug Campaign Brochure, February 1998)

The cost of remedying the Year 2000 problem has been estimated to be between £1000 to £3,000 per employee.⁹⁵ Action 2000 is taking the lead in stimulating action in the private sector and the Business Links agencies are making the millennium bug a priority in their immediate regions. Action 2000 reports that many companies actually find that the problem is larger than they thought when they start assessing the work that needs to be done.⁹⁶

Although the DTI is working with Action 2000 to spur the private sector on in their efforts to tackle the millennium bug, the Government has made it clear that it is down to each company to pay for and organise the work required on its own systems.⁹⁷ Many businesses are already well aware of need to address the problem for their survival. They are also receiving pressure from others in the supply chain.

To help promote action on the millennium bug and demonstrate that UK businesses are taking positive steps to overcome the problem, the Confederation of British Industry (CBI) has set up a Year 2000 Recognition Award scheme. Each month, a CBI member company is “recognised” as having achieved good practice in its millennium compliance programme. The Prime Minister presented the first award in March this year to the Reuters Group plc.⁹⁸

It is estimated that over 50% of companies have not yet acted on the millennium problem.⁹⁹ An awareness survey carried out by Sage Software last year (supported by the DTI) reported that:¹⁰⁰

- 95% of businesses are aware of the millennium compliance problem
- 55% had completed an audit
- Only 43% were planning to allocate budget in 1997-8 to resolve the problem.

⁹⁵ Shortage of time and money, Financial Times, pg VIII, 01.04.98

⁹⁶ Action 2000, Millennium bug campaign brochure, February 1998.

⁹⁷ Beckett bites bug back, DTI Press Release, P/98/040, 22.01.98

⁹⁸ First CBI 2000 recognition award won by Reuters, CBI News Release, 30.03.98

⁹⁹ Blair leads action on millennium bug, The Guardian, pg 7,2.1.98

¹⁰⁰ HoC Deb, col 594WA, 10.12.97

Examples of the magnitude of company spending on the problem are provided below:

- BT £500m (over last 5 years)
- Unilever¹⁰¹ £250m–£300m
- Barclays Bank £250m
- Shell UK £15-40m (to ensure all critical systems are compliant)¹⁰²

- Swiss Bank Corporation¹⁰³ £170m (announced before merger with UBS)
- Credit Suisse Group £123m (costs in 1998 and 1999 only)
- Chase Manhattan £154m

A. Utilities

The utilities have their own millennium compliance programmes and are also involved in the overall contingency planning being co-ordinated by the various government teams.

The Chairman of Action 2000 recently warned that the water industry is trailing behind other utilities in preparing its systems.¹⁰⁴ However, individual companies clearly vary. Thames Water told the House of Commons Science and Technology Committee that "the problems that the company faces ... are significant, but also quite within our capabilities to solve" and that they were confident that their compliance programme, begun in 1996, would be "completed in time to avert detrimental consequences". The Committee went on to comment that:

We received similar evidence from BG plc (one of the two successor companies to British Gas), Railtrack, Shell UK, BT, the BBC, British Nuclear Fuels,and others, many of whom told us that they planned to complete the majority of work on Year 2000 projects by December 1998.

Centrica plc (trading as British Gas in the UK) has a structured programme in place in each of its business units and aims to have completed all planned business critical work by the end of 1998. The company is working to the BSI standard and £43 million has already been set aside for project activity in 1998, with a further £15 million allocated for 1999. The company is aiming to ensure that the risk of disruption to their business operations and customers is minimised and safety is their top priority.¹⁰⁵ BG plc, the other successor company to British Gas, has a similar timetable and sees the millennium bug as fitting in with its everyday continuity planning for emergencies.

¹⁰¹ Shortage of time and money, Financial Times, pg VIII, 01.04.98

¹⁰² Managing the Millennium Threat II, National Audit Office, pg 3, 15.05.98

¹⁰³ State of Y2K Remediation in Switzerland, Gerhard F. Knolmayer, 29.05.98 1998, Westergaard Year 2000 International Watch.

¹⁰⁴ Computer bug time lag "will risk lives", The Guardian, pg 10, 17.06.98

¹⁰⁵ Centrica Year 2000 information at www.centrica.co.uk/html/corp.html

Research Paper 98/72

In an area such as telecoms, it is crucial that action is co-ordinated internationally. Telephone exchanges include embedded processors and some fear that it may be impossible to telephone some countries in the early part of the next century.

The International Telecommunication Union (ITU) is an agency of the United Nations, based in Geneva which oversees global telecoms. The ITU has recently added the millennium bug issue to the work programme of several of its working parties. This move represented a key policy change because previously the ITU had refused to take the lead in the global debate, arguing that it was a matter for individual nations to address and resolve.¹⁰⁶

In the UK, the Telecommunications Managers Association (TMA) is taking measures to make small and medium-sized companies in the UK aware of the issue.¹⁰⁷

Many of the larger UK telecoms companies have compliance programmes well in hand. Cable and Wireless have a Millennium Organiser section on their web site (www.cwcom.co.uk). This provides information on C&W's millennium compliance programme as well as notes for customers and suppliers. C&W is also working towards conforming to the requirements set out by the British Standards Institution (BSI). C&W expects to be testing its systems and have them in operation by the end of December 1998.¹⁰⁸

British Telecom alone expects to spend £300 million, in a project that involves rewriting 300 million lines of code.¹⁰⁹ BT has established a Year 2000 Programme with a dedicated management team and contacted its suppliers to check whether their products will achieve Year 2000 compliance. BT aims to achieve compliance by December 1998 and quickly identify any products that need to be withdrawn, giving customers sufficient time to consider alternatives.¹¹⁰ BT has information on its website (www.britishtelecom.co.uk) outlining its own policy and providing advice to customers.

B. Major hazard sites

The Health and Safety Executive (HSE) has a statutory duty to ensure that employers comply with the provisions of health and safety legislation. The HSE has required operators of high risk sites such as nuclear installations and petrochemical companies to demonstrate that they are addressing century date change problems in all systems, not just safety critical ones. In the case of nuclear installations, none of the safety critical systems related to the nuclear reactor itself are time/date dependent. The HSE will be visiting each high risk site at least once and probably more often before the millennium.¹¹¹

¹⁰⁶ News: International :UN body reverses policy on "millennium bug", Financial Times, 13.10.97

¹⁰⁷ Ibid

¹⁰⁸ C&W Comms Programme Update, January 1998. (From webiste – www.cwcom.co.uk)

¹⁰⁹ Analysis: The millennium bomb: Sell-by date for the century: The double zero at the end of the millennial date spells apocalypse very soon, and for some firms it may already be too late, The Guardian, 15 .01.98

¹¹⁰ www.business.bt.com/2000

¹¹¹ HC 342 1997/98, The Year 2000 – Computer Compliance, Second Report of the House of Commons Science and Technology Committee, pgxvi, 01.04.98.

The House of Commons Science and Technology Committee recently congratulated the HSE on the robust approach it has taken with high risk sites, but recommended that more attention was paid to lower risk sites which were unlikely to be as well prepared.¹¹²

C. Financial Services

1. Banking

Bankers face a variety of millennium bug related problems including: incorrect calculations relating to credit card transactions, mortgage and pension payments as well as possible failure of security systems such as electronic doors, timelock safes and closed-circuit televisions.

The British Bankers Association (BBA) has done much to help co-ordinate the millennium compliance efforts of its members and to raise awareness of the issue. For example, the Association has developed a self-assessment check list aimed at small businesses to help guide them through the work needed to get them ready for the Year 2000. In its evidence to the House of Commons Science and Technology Select Committee, the BBA reassured the Committee that its members were on course to overcome the millennium computer problem. The Association estimates that banks will spend £1bn on the problem, using funds and resources diverted from the development of other products.

However, fourteen of the world's largest investment banks, including BZW, Nomura International and Lehman Brothers, have formed an ad-hoc pressure group. They are frustrated by the likely cost of the problem and lack of guidance from their IT suppliers and regulators.¹¹³

A survey of the world's largest banks published by The Banker Magazine found that half will not have prepared all the computer systems critical to their business by the end of the year. Of the top 1,000 banks surveyed, 496 responded and all said that their computer systems would be ready by 2000. However, 424 banks said that they would not be ready by June 1998 and 250 would still not be ready by December 1998. Credit Agricole said 50-75% of its systems would be millennium compliant by the end of 1998. Deutsche Bank, Sumitomo Bank and Union Bank of Switzerland said their millennium work would be 75-100 % complete.¹¹⁴

Some of the world's largest banks have joined forces to form the Global 2000 Co-ordinating Group. Founder members include: Lloyds TSB, Barclays and Merill Lynch. This will help to share information across the banking sector. The first task will be to identify cities, countries and firms which are important to the smooth functioning of global financial markets and are particularly vulnerable to the millennium bug. The banks will then encourage actions in these trouble spots to improve Year 2000 readiness. The initial information gathering

¹¹² Ibid pg v

¹¹³ Millennium bug prompts banking lobby, Independent, pg 19, 23.12.97

¹¹⁴ Banks "dragging their feet", Financial Times, pg 14, 01.04.98

Research Paper 98/72

exercise will assess the readiness of financial service providers and will also cover electricity suppliers, telecoms companies and transport firms. All financial services providers will also be invited to join the campaign.¹¹⁵

The London Stock Exchange has designed a testing and support service to ensure that those systems of member firms and customers which interface with the Stock Exchange are able to interact successfully after the millennium.¹¹⁶ This will be launched in October 1998 and the facilities will be available until September 1999. The facilities provided by the Exchange will include a mandatory testing of all trading and information messages containing dates around the millennium and a Year 2000 readiness service. The former aims to assess customer's ability to enter trading transactions and receive broadcast data without damaging the Stock Exchange's activities. The latter will be a chargeable service providing test data to help firms in their own system testing.

Banks are having to tackle the millennium bug problem at the same time as preparing for the Euro, which is an added burden. In addition, much computer software written for financial organisations to track the Dow Jones industrial shares index only recognises 4 digits. So, when the Dow (currently slightly below 9,200) approaches 10,000 computers are likely to interpret it as 1,000 or even 0,00 suggesting an imminent drastic slump in share prices. Computers programmed to authorise automatic share sales will sell heavily to avoid the crash.¹¹⁷ It appears that many financial institutions are not aware that they may be vulnerable and have not even begun to assess the possible risks.

2. Insurance

"No sensible company is expecting its insurers to pay for this necessary work. Insurance is not an alternative to taking action, and the directors of any company who think it is are failing in their basic duties"¹¹⁸

(Mark Boleat, Director General, Association of British Insurers)

The Association of British Insurers (ABI) announced in November 1997 that Year 2000 computer problems would be excluded from the policies of ABI members (95% of the insurance industry). The ABI argues that insurance is designed to cover an unforeseeable event whereas the millennium problem is known and foreseeable. Those firms who are offering insurance are requiring companies to pass a tough test requiring them to show that they are making every effort to deal with the millennium problem.¹¹⁹ Marine and aviation insurers are looking for ways to introduce exclusion clauses into their contracts to protect themselves against the possible impact of systems failures.

¹¹⁵ Banks join forces to tackle millennium bug, Independent, pg 28, 09.04.98

¹¹⁶ Year 2000 project – Customer testing services, London Stock Exchange, February 1998.

¹¹⁷ Numbers up-digital doomsday looms, The Guardian, pg 19, 06.05.98

¹¹⁸ Action 2000, Millennium bug campaign brochure, February 1998.

¹¹⁹ Business warned insurers will not cover the IT timebomb, The Independent, 14.11.97,

3. Accounting

As of January this year, the Accounting Standards Board has changed accounting rules so that:¹²⁰

- companies must treat millennium costs as an expense: they will no longer be able to pretend that the work is an investment.
- the loophole is closed which allows companies to class Year 2000 costs as “exceptional items”. This classification on profit and loss accounts meant that companies could take all the costs in whatever year they chose, rather than when the money was actually spent. This could give an unfair reflection of company performance and might make it look more consistent than it actually was.

The Board has also issued an instruction to all companies to disclose their Year 2000 plans, including an assessment of the risks and the costs involved in handling the issue, in their current year’s accounts. The London Stock Exchange has written to listed companies urging them to act on this instruction.¹²¹

The French Stock Exchange has insisted that companies must present their shareholders with credible strategies to tackle the date change. The operations commission of the Bourse requires companies in France to disclose in their 1998 accounts the nature of their preparations, contingency plans, costs and the likely impact on their financial results. This followed a report by the management consultancy Ernst and Young which said that France was lagging behind other countries in dealing with the problem.¹²²

The Australian government has written to listed companies requiring them to provide information on their Year 2000 readiness by the end of June. The German financial authorities are reported to be discussing similar action. Last year the US Securities and Exchange Commission ordered US firms to disclose their progress on the issue.¹²³

The UK Institute of Chartered Accountants has issued a Technical Release¹²⁴ as advice to auditors. It sets out some of the questions that auditors should be asking management. It also suggests what management may need to do to answer those questions. Auditors will not sort out any Year 2000 problems that a company may have as part of the audit process. The Technical Release makes it clear that the auditor’s role is only to review the quality of management’s preparations to deal with the potential problems.

¹²⁰ Millennium bug loophole shut, The Observer, pg 1,14.12.97

¹²¹ Awareness of year 2000 crisis reaches top, Financial Times (IT survey), pg II, 1.04.98

¹²² Awareness of year 2000 crisis reaches top, Financial Times (IT survey), pg II, 1.04.98

¹²³ ibid

¹²⁴ Look ahead for guidance, Financial Times, pg 24, 6.1.98

Research Paper 98/72

The expenditure involved in addressing the Year 2000 problem may be very large and questions have been raised about how HM Customs and Excise believe it should be treated in computing taxable trading profits.

In the April 1998 Tax Bulletin, Customs made its view clear.

“Our view is that an in-house or contracted-out software project to ensure that existing systems can be adapted for the millennium will always be a revenue matter unless it is part of a major new project instituting other changes and the project is of a capital nature. For example, a concern may decide that for strategic reasons the need for the specific millennium conversion expenditure which would otherwise have been necessary should be pre-empted by a much more substantial undertaking, such as the development of an entirely new (and of course millennium-proof) business system.

.....We would normally expect expenditure on off the shelf software designed specifically to solve the Year 2000 problem to be revenue.

Thus spending on remedial software and on outside project teams will be considered as revenue rather than capital expenditure, and therefore eligible to be written off against corporation tax in the year the expense is incurred.¹²⁵ However, the cost of replacing old computers with new millennium-compliant systems will continue to be considered as capital expenditure to be depreciated over a number of years.

D. SMEs and the supply chain

Clearly, it will not be adequate for firms to only ensure that they are millennium compliant. It is in their interests to check that their customers and suppliers are too, because problems experienced by these players will have knock-on impacts along the supply chain. For example, the supplier and packagers of a product may be millennium compliant, but the warehouse operation they use may not. This could lead to products being wrongly labelled and therefore wrongly dispatched or even destroyed as past their sell-by date. Unilever has estimated that up to a fifth of its smaller suppliers may not deal with the Year 2000 issue in time and they are therefore likely to lose their business with the group.¹²⁶

The Chairman of Action 2000, Don Cruickshank, has warned that up to 500,000 Small and Medium Enterprises (SMEs) have not moved as quickly on the issue as they should have done. He feels that many are caught in a legal “paper chase” with customers and suppliers seeking premature guarantees that the problem has been dealt with.¹²⁷ Action 2000 has earmarked half its budget towards raising awareness among SMEs¹²⁸ and is encouraging larger companies to assist smaller businesses. The CBI fully supports this approach and its Director General, Adair Turner has commented:¹²⁹

¹²⁵ Tax break to help business in computer “bomb” battle, Financial Times, pg 9, 09.03.98

¹²⁶ Look ahead for guidance, Financial Times, pg 246.1.98

¹²⁷ Resources “wasted “ on lawyers, Financial Times, pg 10, 04.06.98

¹²⁸ *ibid*

¹²⁹ Firms must use 1998 to defuse millennium bomb, CBI Press Release, 29.12.98

The key to unlocking action will be to take an open approach. While commercial confidentiality is a consideration, it is in the interests of all companies to be as open as possible, learn from each other and push for action within their common areas of interest. And in many cases the solution will require some elements of common action between companies, suppliers and customers.

“A network of champions” should be created across the business community, by sector and geographically, to help smaller firms identify the problem and get on with finding a solution on the basis of real information and established practice.¹³⁰

A recent communication from the European Commission states that:

Because of their weaker organisational structure, addressing a problem of this nature presents SMEs with potentially a higher degree of difficulty and with disproportionately higher levels of costs compared to large companies. In extreme cases, the actual survival of an enterprise may be in question. At this point in time, evidence suggests that SMEs have a particularly low level of awareness and face special problems in terms of access to relevant information.¹³¹

In a survey of 1,200 managers of small and medium-sized UK firms, commissioned by the Action 2000 Millennium Bug Campaign, 98% said that they were aware of the millennium bug. Of the 1,200 managers interviewed, over 1,000 worked at companies employing fewer than 500 staff.¹³²

A hard core of one in eight firms (13%) said they had taken no action to tackle the problem, with the majority of those (83%) saying they did not intend to do so. The main reasons given, were that the problem did not affect the company or no action was necessary. 13% had insufficient resources and 5% believed that the issue had been “hyped up”.

The agriculture sector appeared to be the least willing to take action, with almost a third of all companies (29%) in this sector doing nothing. Next was the construction industry (22%), followed by the transport and communications sector (16%). In contrast, engineering companies and the banking and finance sector were found to be the best prepared, with 94% and 92% taking action respectively.

Of those companies taking action, only one in seven (15%) had allocated a separate budget to cover millennium bug work. Among smaller companies, employing fewer than 50 staff, only 5% of those tackling the bug had a specific budget to finance the work. This rose to over a third (36%) of larger companies employing over 500 staff. Only 7% of companies had taken on extra staff to work on millennium compliance related projects, with a further 8% intending to do so. One in 10 companies had already experienced bug-related problems when forecasting, ordering, planning or handling finances.

¹³⁰ Business needs to work together to tackle computer millennium date change, says CBI, CBI Press Release, 27.10.98

¹³¹ The Year 2000 problem, Communication from the Commission to the Council, The European Parliament, The Economic and Social Committee and the Committee of the Regions, COM (1998) 102.

¹³² Millennium Bug starts to creep up on UK businesses: Action 2000 research finds companies at critical juncture in their Year 2000 work, Action 2000 Press Release, 23.04.98 (www.open.gov.uk)

Research Paper 98/72

The DTI is supporting The Business Assurance Scheme (BAS) which has been launched by the National Computing Centre (NCC) to help SMEs and is based around the NCC's new diagnostic tool which can generate a report detailing the business risk to a firm from the millennium bug as well as producing a realistic, prioritised action plan.¹³³

The House of Commons Science and Technology Select Committee agreed that there was some evidence to suggest that large companies had a genuine cause for concern as a result of Year 2000 related problems in other companies on whom they rely as suppliers, customers or trading partners, especially where those companies are SMEs. The Committee made the following recommendation:¹³⁴

(u) Another means of reaching businesses directly would be to include information leaflets in telephone or other utility bills which are delivered to the majority of Small and Medium-sized Enterprises. We recommend that Action 2000 treat stimulating action on the part of Small and Medium –sized Enterprises with the highest priority and that it works with the Business Link network and other organisations in close contact with Small and Medium-sized Enterprises to ensure that its message is not only sent but received.

¹³³ New nationwide scheme from NCC tackles small businesses' Year 2000 problems, NCC Press Release, 26.01.98

¹³⁴ Ibid pg vi

X The Legal Situation

Lawyers are already warning firms about the legal dangers of inaction in relation to the Year 2000 problem and predict a spate of litigation between businesses and information technology suppliers after 2000.

Although there is no specific legislation which requires companies or individuals to ensure that their systems are millennium ready¹³⁵ there are a number of possible routes of redress:

- **Statutory obligations may not be met.** E.g. local authorities may not be able to provide certain services, there may be breaches of data protection legislation and health and safety requirements with the failure of safety systems in both the private and public sector.
- **Claims for replacing deficient equipment, interruption to business, damage to property or personal injury.**

In some cases there could be issues of personal liability for company directors, school governors, and hospital trustees. Board directors owe a duty of skill and care to the company and although not liable for honest mistakes, they are liable for gross negligence. The solicitors Withers have warned:¹³⁶

It is now getting too late for directors reasonably to plead ignorance of the problem. They should have no problem if they move reasonably quickly to investigate the position and take appropriate steps towards compliance and legal protection. If, however, directors sit on their hands they could be guilty of gross negligence.

Many organisations or individuals may use the Supply and Sale of Goods Act 1994 which requires “satisfactory quality” and does cover goods containing software or embedded chips.¹³⁷ The danger for computer owners is that breach of contract, if the IT system was inadequate, would be deemed to have taken place at the time when the system was purchased. There is a 6 year time limit (5 years for Scotland) on initiating action, so some companies will find that their IT suppliers are safe from legal attack unless they act quickly.¹³⁸

However, relying on legal remedies to address the problem is somewhat of a foolhardy move. The consequences of non-compliance are likely to be much greater than the remedy and even if a remedy is achieved the benefits would probably be too late to benefit the organisation whose operations have been interrupted. In addition, multiple claims on a particular firm may force them into insolvency.

¹³⁵ HC 342 1997/98, The Year 2000-Computer Compliance, Second Report of the House of Commons Science and Technology Committee, Volume 1, pg xviii, 01.04.98

¹³⁶ www.withers.co.uk

¹³⁷ Ibid pg xviii

¹³⁸ Act now to beat the bug, The Guardian, pg 17, 23.12.97

Research Paper 98/72

The House of Commons Science and Technology Committee made the following recommendations regarding litigation:¹³⁹

- (l) We conclude that organisations should not consider legal action as a primary remedy to Year 2000 problems but as a last resort and should not plan to enter litigation in preference to taking preventative action now. We strongly believe that this is the message which Action 2000 should promulgate widely and loudly.
- (m) The risk of legal action on the part of those affected by century date related failures reinforces the need for all organisations to undertake thorough Year 2000 preparations to ensure that their systems, products and services are millennium ready. It should also be seen as a reason to keep thorough and accurate records of all remedial measures in case called upon by the courts to demonstrate that all reasonable steps to avoid system failures were taken.

A. Companies (Millennium Computer Compliance) Bill

A ten minute rule Bill has been sponsored by Mr David Atkinson which seeks to add a clause to the Companies Act 1985 to place a duty on every company to perform a “millennium computer assessment” relating to the millennium date problem. The outcome of this assessment would have to be included in the company’s annual report, together with a statement of the action that they intend to take to deal with the problem. The idea being to clarify the situation well in advance and place responsibility on company directors to ensure that their computer systems were properly tested.

The Bill was first put forward in the 1996/97 session and the Conservative Government did not offer its backing. They took the line that it was best for companies to take voluntary action and that the Bill would impose an unnecessary burden and an unhelpful shift of focus on the problem. However, the Government allowed the Bill to go to Committee to allow the opportunity for debate of the issue to attract publicity for the problem. The Bill has been introduced again in this session and has yet to obtain a second reading.

B. Year 2000 Conformity Standard

The British Standard’s Institute (BSI) has developed a definition for Year 2000 conformity. This definition stipulates that:

“Year 2000 conformity shall mean that neither performance nor functionality is affected prior to, during or after the Year 2000.”

There are a number of associated rules which qualify this definition.

Although this definition provides the ultimate, utopian, “millennium compliance” yardstick, in reality it is not a viable proposition for most organisations and perhaps not always a

¹³⁹ HC 342 1997/98, The Year 2000-Computer Compliance, Second Report of the House of Commons Science and Technology Committee, Volume 1, pg vi, 01.04.98

necessary one if non-compliance in certain areas is not going to affect performance. This view was expressed by the select committee who felt that the key objective was for individuals and organisations to be “millennium ready”, i.e. equipped with compliant systems or prepared to manage the consequences of non-compliance.¹⁴⁰

Action 2000 has launched a “Millennium Safe” logo as part of its “Millennium Bug” campaign. Businesses are encouraged to use the logo on their products “when they feel confident enough about their millennium bug projects or products to say in public that they are Year 2000 compliant. However, this does not mean that a product or supplier is Government approved.”¹⁴¹

¹⁴⁰ HC 342 1997/98, The Year 2000 – Computer Compliance, Volume I, Second Report of the House of Commons Science and Technology Committee, pg xi, 01.04.98

¹⁴¹ Ibid, para 69, pg xxvi

XI Skills

It is now widely recognised that there is a general shortage of IT skills with the upturn in the economy and the boom of the telecommunications industry creating high demands in this area. The shortage has been made more acute with the need to address issues such as the millennium date problem and the European single currency. This scenario has highlighted the need to encourage computer literacy in schools and to consider the re-training of the existing workforce. For example, the IT consultancy, Logica, is seeking to recruit not only young non-IT graduates, but also early retirees from the banking industry and the armed services. The company is also offering staff a £2,000 bonus if they introduce a new employee with IT skills.¹⁴²

A complete Year 2000 compliance project might take 50 programmers almost three years¹⁴³ and the IT consultancy, Cap Gemini estimates that demand for information technology (IT) staff to fix the problem will exceed supply after this April.¹⁴⁴ The company also predicts that a shortage of Cobol programmers will mean that 11% of companies, including many large corporations, will fail to meet the Year 2000 deadline for re-programming their systems.¹⁴⁵

The Computer Services and Software Association estimates that there is a UK shortfall of 30,000 people out of a skills base of 600,000.¹⁴⁶ The European IT Observatory reports that an acute shortage of programmers and analysts is affecting the entire European industry. In the next five years Europe will need between 1.5m and 2m more IT professionals. Whilst in the US industry representatives have claimed that there is a shortage of 340,000.¹⁴⁷

The unprecedented skills shortage is pushing up costs to extraordinary levels. Even within the last 12 months, firms have started to pay three to four times more for consultants and technicians who can solve the millennium problem. Firms are poaching skilled staff and warnings have been coming in from leading firms that they will soon simply run out of trained people.¹⁴⁸

In this year's Budget, the Government allocated £70 million to help small and medium sized businesses develop their IT skills. On 30 March, the Department for Education and Employment, announced that a significant part of that (£30 million) will be focused on the immediate need to solve the millennium bug problem.¹⁴⁹ The £30 million will be

¹⁴² Smart moves: The millennium bug brings rich pickings, Independent on Sunday, 11.01.98

¹⁴³ Ibid

¹⁴⁴ Ibid

¹⁴⁵ Ibid

¹⁴⁶ Ibid

¹⁴⁷ Awareness of year 2000 crisis reaches top, Financial Times (IT survey), pg II, 1.04.98

¹⁴⁸ Analysis: The millennium bomb: Sell-by date for the century: The double zero at the end of the millennial date spells apocalypse very soon, and for some firms it may already be too late: The Guardian, 15.01.98

¹⁴⁹ Blunkett welcomes millennium bug training pledge, Department for Education and Employment, 163/98, 30.03.98

administered through time-limited grants worth approximately £1,300 per trainee. The grants will finance accredited short courses covering key tasks in assessing and fixing IT systems to ensure their compliance with Millennium date change needs.

If the Government gets the anticipated response from industry there will be 20,000 “bug busters” fully trained by April 1999.¹⁵⁰ Mr Blair has said that it is “a perfect opportunity to train young people in IT skills or to bring older unemployed or retired people back into the workforce, launched on a new career in information technology”.¹⁵¹

However, there are concerns that this target is ambitious bearing in mind the present skills shortage in the IT industry. Finding enough people will probably mean offering additional training to people already in IT or non-specialists within firms that need to solve the problem. However, even if enough people put themselves forward, they may not be able to help firms. Although the problem itself as a concept is simple the business systems which it affects are often highly complex and involve specialised languages. Hence, the CSSA (Computer Software and Services Association) has suggested that the most successful course of action is likely to be if the money is made available to organisations to train their own staff to deal with the problem. Where the new entrants might be able to help is in testing systems which is very labour intensive. This would help to free up existing experienced staff from routine work to concentrate on the millennium problem.¹⁵²

¹⁵⁰ Blair to hire 20,000 for millennium bug army, The Independent, pg1, 30.03.98

¹⁵¹ Beat the Millennium bug or everyone catches a cold, Tony Blair on diffusing the timebomb, The Independent, pg 17, 30.03.98

¹⁵² Tony Blair’s millennium bug army, The Independent, pg 4, 07.04.98

problem.¹⁴⁹ The £30 million will be administered through time-limited grants worth approximately £1,300 per trainee. The grants will finance accredited short courses covering key tasks in assessing and fixing IT systems to ensure their compliance with Millennium date change needs.

If the Government gets the anticipated response from industry there will be 20,000 “bug busters” fully trained by April 1999.¹⁵⁰ Mr Blair has said that it is “a perfect opportunity to train young people in IT skills or to bring older unemployed or retired people back into the workforce, launched on a new career in information technology”.¹⁵¹

However, there are concerns that this target is ambitious bearing in mind the present skills shortage in the IT industry. Finding enough people will probably mean offering additional training to people already in IT or non-specialists within firms that need to solve the problem. However, even if enough people put themselves forward, they may not be able to help firms. Although the problem itself as a concept is simple the business systems which it affects are often highly complex and involve specialised languages. Hence, the CSSA (Computer Software and Services Association) has suggested that the most successful course of action is likely to be if the money is made available to organisations to train their own staff to deal with the problem. Where the new entrants might be able to help is in testing systems which is very labour intensive. This would help to free up existing experienced staff from routine work to concentrate on the millennium problem.¹⁵²

¹⁴⁹ Blunkett welcomes millennium bug training pledge, Department for Education and Employment, 163/98, 30.03.98

¹⁵⁰ Blair to hire 20,000 for millennium bug army, The Independent, pg1, 30.03.98

¹⁵¹ Beat the Millennium bug or everyone catches a cold, Tony Blair on diffusing the timebomb, The Independent, pg 17, 30.03.98

¹⁵² Tony Blair’s millennium bug army, The Independent, pg 4, 07.04.98

XII Future outlook

As has been made clear in this paper, it is difficult to predict the consequences of the millennium bug. All we can do is try and identify the scale of the problem, try and tackle it and plan for expected as well as unexpected system failures. However, it is not only the century date change that our computerised world is not entirely geared up to cope with. The thorough inventories of systems which the millennium bug problem has generated have helped to bring to light other unforeseen problems. In particular other potentially critical dates have been discovered. A full list is provided in Annex A of the House of Commons Science and Technology Committee report.¹⁵³ Examples include:¹⁵⁴

- **1 January 1999 (1/1/99):** This has been used by programmers to indicate special situations.
- **9 September 1999 (9/9/99):** This is used as an “end of sequence” marker
- **29 February 2000 (29/2/2000):** Some systems do not recognise the Year 2000 as a leap year, and so do not allow this as a valid date. Some do allow this date, but then fail on 31/12/2000 because the system does not permit a 366th day of the Year 2000.
- **Fixed start dates:** Some systems are programmed with a fixed start date and count from that date. The counter will usually count seconds or fractions thereof and will eventually reach the highest number it can count up to. At this point it will normally reset to zero, and the system will think that the current is the fixed start date.
- **1998 and 1999:** The numbers 99 and 98 have often been used by programmers as error flags for other purposes or to denote the end of files.

Most millennium compliance programmes are now tackling these issues at the same time as the century-date change and the recent focus on the millennium bug will perhaps make us better placed to deal with similar problems which come to light in the future.

Overall, it seems that there is a lot to be done to ensure a Happy New Year in 2000 but the House of Commons Science and Technology Committee enquiry leaves us with an optimistic conclusion.¹⁵⁵

The millennium bug poses a genuine risk of disruption but, provided concerted and well co-ordinated action is taken to build on the progress already made, the Committee believes that the UK can achieve an acceptable level of millennium readiness and celebrate the millennium without concerns about widespread disruption.

¹⁵³ HC 342 1997/98, The Year 2000 – Computer Compliance, House of Commons Science and Technology Committee, pg xxxiii, 01.04.98

¹⁵⁴ Embedded systems – A guide to evaluating how this problem could affect your business, Action 2000 Millennium Bug Campaign, February 1998.

¹⁵⁵ HC 342 1997/98, The Year 2000 – Computer Compliance, Second Report of the House of Commons Science and Technology Committee, 01.04.98

Appendix A: Cabinet Group¹⁵⁶ – Membership

President of the Board of Trade and Secretary of State for Trade and Industry (Chair)

Paymaster General

Minister of State Scottish Office

Minister of State, Ministry of Defence

Minister of State, Northern Ireland office

Parliamentary under Secretary of State, DETR

Parliamentary under Secretary of State, Home Office

Parliamentary under Secretary of State, DfEE

Parliamentary under Secretary of State, DTI

Parliamentary under Secretary of State, MAFF

Parliamentary under Secretary of State, Welsh Office

Other Ministers are invited to attend for items which they have a departmental interest and the Chairman of Action 2000 is invited to attend.

¹⁵⁶ Beckett bites bug back, DTI Press Release P/98/040, 22.01.98

Appendix B: Ministerial Sub-Group¹⁵⁷ on the Millennium Date Change

Dr David Clark	Chancellor of the Duchy of Lancaster
Dawn Primarolo	Financial Secretary, Treasury
Hilary Armstrong	Minister of State, Department of the Environment, Transport and Regions
Henry McLeish	Minister of State, Scottish Office
Lord Gilbert	Minister of State, Ministry of Defence
Alan Milburn	Minister of State, Department of Health
Kim Howells	Parliamentary Under Secretary of State, Department for Education and Employment
Barbara Roche	Parliamentary Under-Secretary of State at Department of Trade and Industry
Lord Donoughe	Parliamentary Secretary of State Ministry of Agriculture, Fisheries And Food
Keith Bradley	Parliamentary Under-Secretary of State, Department of Social Security
Peter Hain	Parliamentary Under-Secretary of State, Welsh Office
Lord McIntosh of Haringey	Deputy Chief Whip, House of Lords

Other Ministers may be invited to attend for specific items. (Northern Ireland Office receives copies of papers).

¹⁵⁷ *First meeting of ministerial sub-group on the millennium date change, Cabinet office CAB 17/98, 23.01.98*

Appendix C: Milestones

1996

August Taskforce 2000 established

1997

May National Audit Office produces report *Managing the Millennium Threat*

September Establishment of Action 2000 announced

12 November Cabinet Office issues press release to emphasise the Government's determination to address the millennium bug problem.

1998

22 January Action 2000 launches campaign

29 January First meeting of ministerial sub-group on the millennium date change

25 February Commission produces communication on *The Year 2000 Computer Problem*

03 March David Clark reports on Government progress in dealing with the millennium bug.

30 March Prime Minister's speech at the Midland Bank Millennium Conference - PM announces £30 million for training aimed at tackling the bug

31 March Dr David Clark announces action to tackle the millennium bug: including:

- New Year 2000 team for Office for Public Services.
- Ernst and Young Project on behalf of the Cabinet Committee (MISC 4) to define and map essential public services of the UK.
- NHS to have reported to Department of Health on plans for tackling the bug
- John Prescott and Sir Jeremy Beecham (Chairman of the Local Government Association) had written to every local authority leader asking them to set up a working group in their area.

Research Paper 98/72

- 01 April House of Commons Science and Technology Committee reports on *The Year 2000 – Computer Compliance*.
- 08 May UK hosts EU millennium bug conference
- 15 May National Audit Office produces second report *Managing the Millennium Threat II (including particular case studies of the NHS and DSS)*
- 08 June Dr David Clark provides 2nd Government progress report.
- 15 June Audit Commission report “A Stitch in Time – Facing the challenge of the Year 2000 date change.

Appendix D: Useful Contacts

- **Action 2000**

Hotline: 0845 6012000

- **IT National Training Organisation Ltd (ITNTO)**

16 Berners Street
London
W1P 3DD

Tel: 0171 580 6677

Fax: 0171 580 5577

Email: aiss@itnto.org.uk

- **AISS (Alliance for Information Systems Skills)**

Can be contacted via the ITNTO

Tel: 01932 761471

Fax: 01932 761471

- **British Computer Society**

www.bcs.org.uk

Tel: 01793 417417

- **Computer Software and Services Association (CSSA)**

Tel: 0171 405 2171

www.cssa.co.uk

- **Health and Safety Executive**

Tel: 0541 545 500

www.hsebooks.co.uk

Appendix E: Further Reading

- A Stitch in Time:Facing the Challenge of the Year 2000 Date Change, Audit Commission (Management Paper), 15 June 1998.
- Managing the Millennium Threat II, Report by the Comptroller and Auditor General, National Audit Office, 15.05.98
- The Millennium Threat – An Update, POST Note 98, June 1997.
- Safety and the Year 2000, HSE, ISBN 0 7176 14913
- The Year 2000 – Computer Compliance, Second Report of the House of Commons Science and Technology Committee, Session 1997-8, 01.04.98