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THE Y2K CHALLENGE

FINAL REPORT



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PREFACE

The Y2K event was one of many “known unknowns” that required the leadership and capability to react and manage the risk of business situations that had no precedent. The historical wait-and-see attitude of some people was not going to work against the so-called “millennium bug”. The ultimate test of Year 2000 readiness and success was to be an organisation’s ability to manage events and not the crisis.

It was the realisation by the Kenya Government and the private sector of the potential of the Y2K problem to disrupt the national economy and social life of our people that led to the establishment in October 1998 of the National Year 2000 Steering Committee to co-ordinate Kenya’s Y2K preparations. While the Steering Committee was responsible for co-ordinating national Y2K programme, Y2K was not a competitive issue for firms, and individual organisations throughout our national spectrum – whether public or private - took responsibility for their own Y2K preparation activities. This included due diligence to deliver their own vision to their own stakeholders and to the country, while borrowing a leaf at the same time, from the emerging world best-practices.

It was the vision of the National Y2K Steering Committee that every Kenyan resident had a right to normal life – with least disruptions prior to, during and after roll-over date change. ‘Normal’ life meant the unfettered provision of the basics of life, namely: water, power, finances, healthcare, transport, telecommunications, electricity and security. Consequently, a National Y2K Co-ordination Centre was established to work very closely with the key operators within strategic sectors of our economy to deliver the stated and well-defined national vision.

This report represents the culmination of Kenya’s Y2K due diligence process. The National Y2K Co-ordination Centre was manned by qualified personnel seconded from their regular places of employment. In the group were engineers, academics, professionals, technologists and managers from dichotomous backgrounds ranging from food processing, banking, power generation, communications, aviation to health informatics, who together were responsible, in working with respective organisations, for ensuring Kenya’s Y2K challenge was met.

This report has been written in a style intended to engage the reader and at the same time serve as a case study or template for the successful management of future large scale, national complex and uncertain projects. Significant lessons were learnt throughout the project which are of enormous potential benefit in the future and there is commitment to seeing that the challenges and recommendations expounded in this report will be duly communicated to the relevant authorities, with the aim of having them implemented. This will be treated as a matter of national priority, especially the case for strengthening national disaster management systems and establishing an institutional and legal framework to make Kenya an information and digital society for accelerated economic and social development.

The smooth transition our country experienced into the millennium with all sectors working as normal, was as a result of tremendous mobilisation of people and resources. It was also due to the commitment of our government, the private sector, the Y2K workers and individual Kenyans that our nation was rated as one of the best-prepared countries in the continent comparable to any in the world.

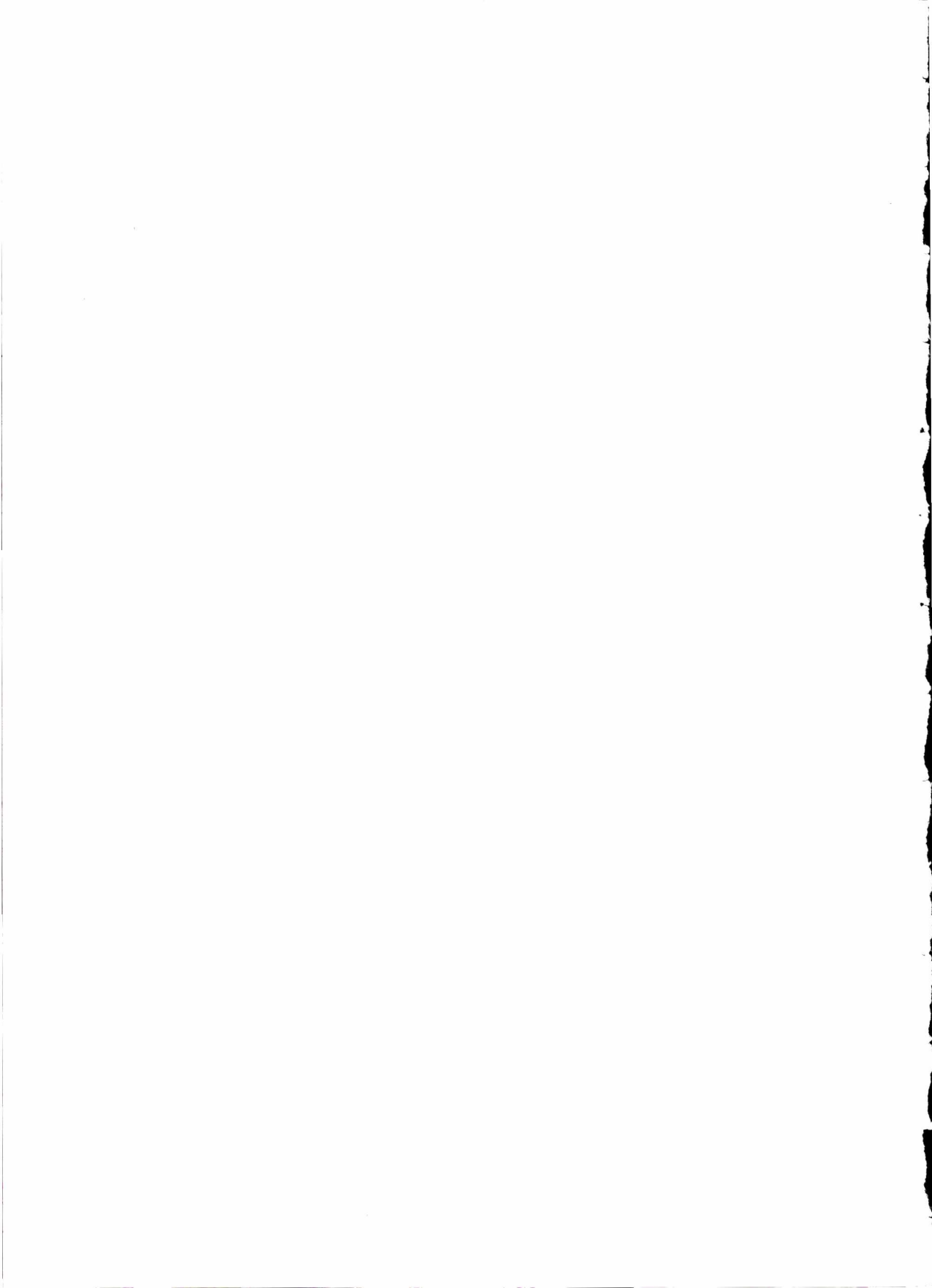
The level of success in meeting Kenya's Y2K challenge gave rise to accusations that it was all a hoax. In fact, it was a triumph for organisation, foresight and collective commitment to a vision. Y2K was indeed not a hoax; we had to tackle the problem seriously and we came out on top. Y2K made it clear that the whole world is an interdependent network of demand and supply chains within which the need for healthy relationships is critical.

On behalf of the National Y2K Steering Committee, it is my pleasure to take this opportunity to thank everybody who made Kenya's Y2K compliance a great success.

I would like to pay special tribute to H.E. President Daniel T. Arap Moi for his foresight in setting up the Steering Committee and for his support and commitment for the management of the Kenya Y2K process. I would also like to thank in a special way my predecessor as Chairman of the National

Y2K Steering Committee, Ms. Margaret Chemengich and her committee for laying the strong foundation on which we built the national Y2K success.

Martin Luke Oduor-Otieno
Chairman – National Year 2000 Steering Committee &
Permanent Secretary, Ministry of Finance and Planning



ACKNOWLEDGEMENT

Y2K brought into focus that sometimes interdependence is more important than independence. Delivery of life as 'normal' in Kenya in the face of the economic and social challenges posed by Y2K was the synergistic product of the commitment and efforts of many organisations and individuals. Much appreciation goes to the many organisations, both public and private, the IT and Y2K professionals, the media and individuals who worked tirelessly and against an immovable time deadline to deliver life as normal in Kenya through their individual and co-ordinated efforts.

A deep sense of gratitude goes to the following:

- The Government of Kenya who funded the operational costs of the National Y2K Co-ordination Centre
- The individual organisations that seconded full time personnel to the Centre at their cost. Among these organisations were:
 - East Africa Industries Ltd., who provided the Director for the Centre
 - Ministry of Finance, who provided both the Deputy Director for the Centre and the Co-ordinator for Government Services.
 - Central Bank of Kenya who provided the Co-ordinator for Banking and Financial Sector, and the Finance and Administration Manager for the Centre. In addition, Central Bank of Kenya supported the national Y2K programme by providing office space.
 - Department for International Development (DFID) of British Government, who provided Co-ordinator for Health, Safety and Environment Sector and the Programme Manager. DFID, in addition, funded regional collaboration for cross-border services of banking, energy, telecommunications and air travel.
 - University of Nairobi, Department of Electrical Engineering who provided the Co-ordinator for Transport and Tourism Sector.
 - Kenya Power and Lighting Company for the Co-ordinator for Public Utilities (Power, Telecommunications and Petroleum Sectors)
 - Kenya Generation Company (KenGen) who provided the Co-ordinator for the Manufacturing Sector.
 - Directorate of Civil Aviation for the Co-ordinator for Agriculture and Commerce Sectors.
 - DCDM Consulting Ltd., who provided the Co-ordinator for the Small and Medium Enterprises (SMEs).

- Kenya News Agency for the Media and Publicity Officer.
- Kenya National Library Services who provided the Documentation and Website Administrator and;
- East African Co-operation Secretariat based in Arusha who hosted and provided secretarial services for the regional Y2K meetings.

The National Y2K Programme also received some financial support under the InfoDEV Programme mainly to cover awareness campaigns. Coca-Cola Company Ltd supported the National Y2K Initiative by funding Y2K Audits of two key sectors. USAID brought in Mr. Chuck Ashman, President - Millennium Information Service and Chairman – Team 2000USA to address dignitaries attending the COMESA Summit in Nairobi in May 1999 and sensitised them on the need to address Y2K in their respective countries. In addition USAID/USIS joined the Centre in organising a Y2K Workshop for SMEs. USAID met the costs of the resource personnel from USA, while USIS assisted in the programme administration.

Lastly we pay special tribute to the International Y2K Co-operation Centre (IY2KCC), based in Washington DC, for their invaluable support in providing global best practices and their comprehensive communication and reporting network through regional workshops and their Y2K website.

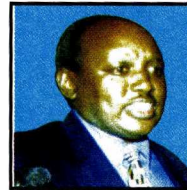
KENYA NATIONAL YEAR 2000 STEERING COMMITTEE MEMBERS



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Chairman-Kenya National Y2K
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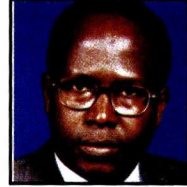
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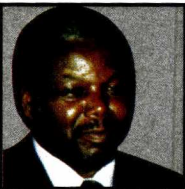
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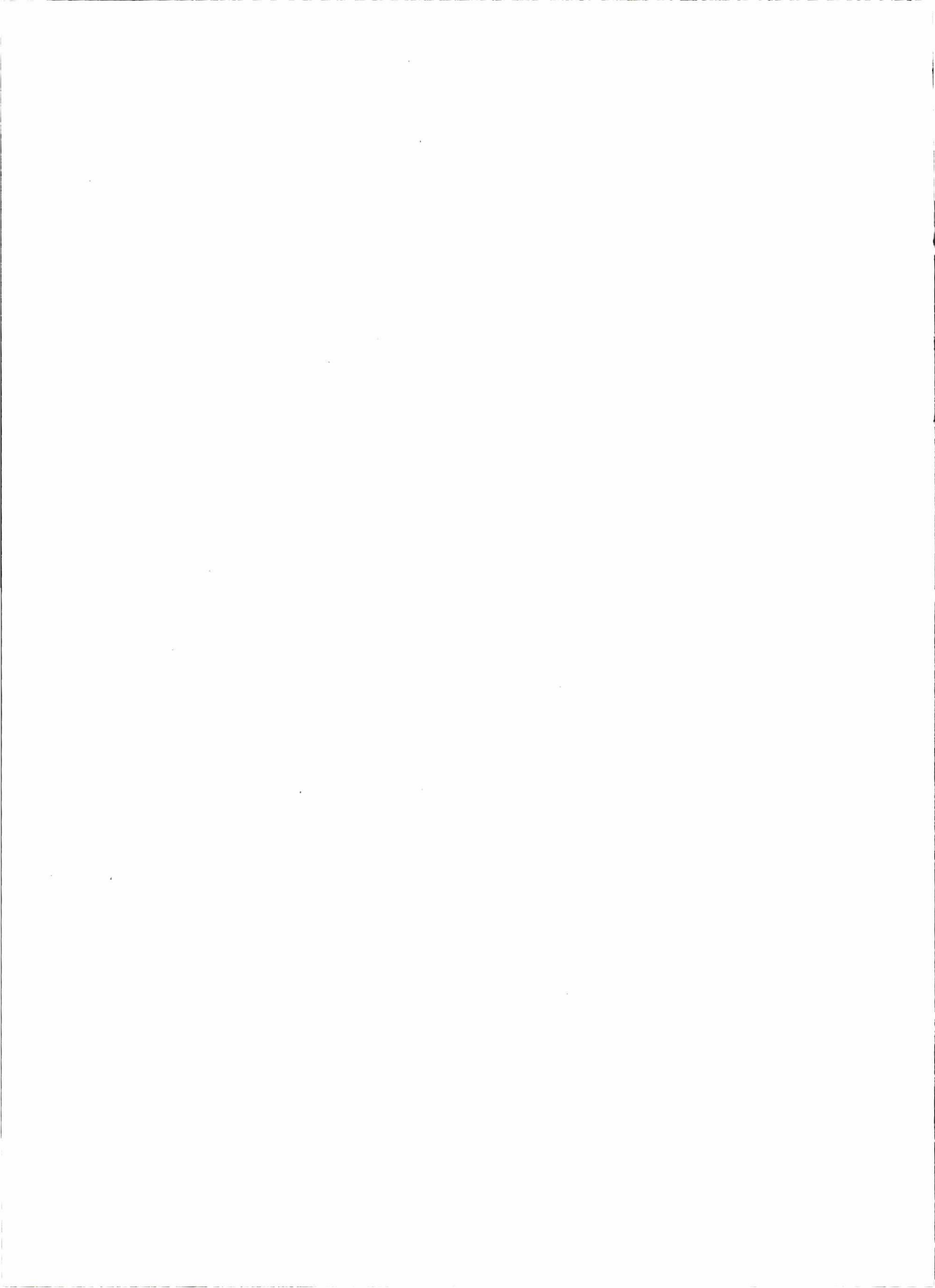


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PS, Ministry of Health*

NB.—Ms. Margaret K. Chemengich was chairman, October, 1998, to June, 1999.
Mr. Stanley Murage was member, October, 1998 to June, 1999.
Mr. Crispus Mutitu was member, October, 1998, to June, 1999.



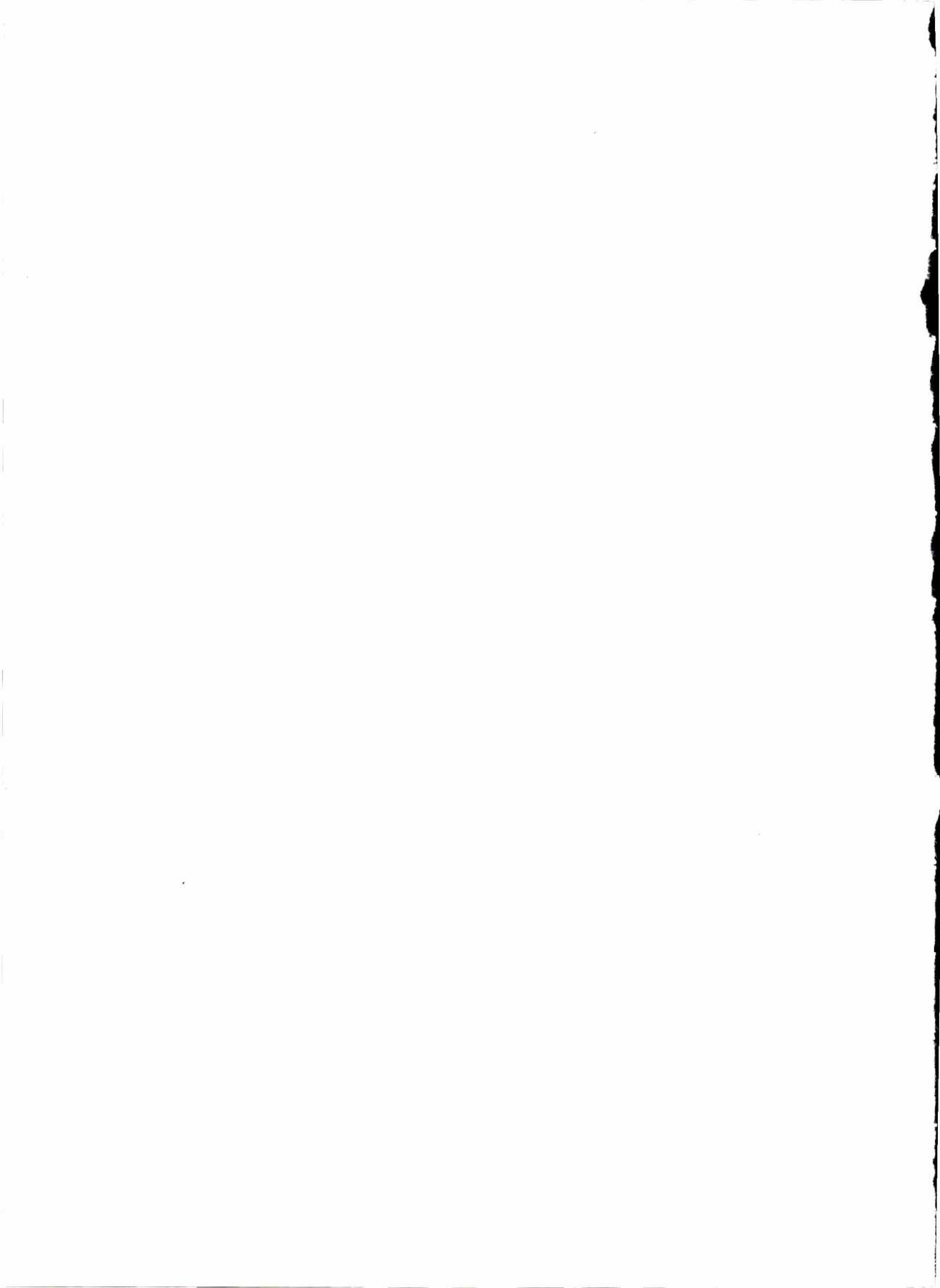
TERMS OF REFERENCE OF THE NATIONAL YEAR 2000 STEERING COMMITTEE

The terms of reference of the National Year 2000 Steering Committee (NY2KSC) were:

- a. Develop and supervise the implementation of a National Plan
- b. Initiate the formation and co-ordination of sectoral task forces
- c. Carry out risk analysis and develop impact management for each of the affected sectors
- d. Develop and supervise the implementation of the National Contingency Plans
- e. Advise on the legal implications of non-compliance by different sectors
- f. Solicit for funding both locally and from donor agencies for solving the problem effectively
- g. Establish a National Y2K Co-ordination Centre with its own Secretariat and a National Resource Centre where co-ordination efforts for solving the problem nationally will be driven from.

The Centre should be less bureaucratic, non-profit making and action/result-oriented

- h. Deal with other issues that are pertinent to the problem such as creating awareness, anti-dumping efforts and disposal of non-compliant equipment
- i. Production of at least a quarterly report for information on the National efforts and preparedness in solving the problem.



EXECUTIVE SUMMARY

The Problem

Some years back computer programmers, in order to save expensive memory and increase processing speeds, adopted the use of two-digits in date fields to denote the year in computers and digital control systems. Thus, for example, the year 1990 was stored in the computer as "90". The Y2K problem then stemmed from the fact that where computers use the year to calculate, sort and compare data, control or supervise a system, this would malfunction when it encountered "00" for the Year 2000.

Meeting a Once-in-a-Lifetime Challenge

The challenge of evaluating the impact of Y2K lay in identifying and testing the millions of digital systems in computers and automated systems. This could affect any system with a microchip having a date functionality ranging from computers, telecommunications equipment, power systems, medical equipment, manufacturing plants, financial transactional systems, navigational systems, home appliances, etc.

Changing the way computers and systems with embedded microchips dealt with dates was a straightforward but dauntingly large-scale job. It required planning and project management skills of the highest order to get the work completed within the time available.

The real challenge lay in ensuring the continuity of 'life as normal' when, by implication, the nation's everyday life depended almost totally on the technology, which was most at risk.

'Life as normal' - not technology – was the real Y2K challenge

Kenya, like the rest of the world, had only one chance to deliver Y2K success and took it. The deadline was fixed and absolutely non-negotiable. The challenge itself was unique and never again to be encountered.

Uncertainty Equals Risk

Uncertainty was the dominant characteristic of Y2K. Risk Management is the only way to handle uncertainty. Risk Management thus became the central focus of all Y2K activities.

Against a background of uncertainty and in the context of large and complex challenges such as Y2K, risk is rarely, if ever, confined to a single organisation or even a single sector of the economy. This meant that relationships had to be built to enable different groups to manage common risks.

This, in turn, meant bringing the public sector and private enterprises together to manage their shared Y2K risks. The skills and lessons learnt in this should be put to work for future large, complex and uncertain challenges Kenya faces.

There were no 'Y2K Islands'

Every step of the Y2K challenge highlighted the extent of interdependence and networks of mutual and shared infrastructures, and attendant risks, throughout Kenya's economy.

The realisation that no individual, no firm, no organisation, no institution, in fact no single entity at all, could attain Y2K readiness alone, meant the challenge had to be met in ways not previously thought possible. The lesson that everyone is someone's customer opened up significant opportunities as a result.

Vision and Leadership

Against this background, Kenya's trouble-free transition into the new millennium was a just and fitting reward for the vision maintained and leadership given to Y2K. The leadership was given by the Government and key players in the private sector who on realising the potential of Y2K to disrupt national economic and social life established and participated in the National Y2K Steering Committee to co-ordinate the national Y2K programme in the Country. The extensive work done throughout the economy by all the relevant stakeholders and overseen by the National Y2K Co-ordination Centre delivered the smooth transition into the year 2000 in Kenya.

Chief Executives of majority of organisations were in control of their Y2K work. The International Y2K Co-operation Centre in their recently released final report noted the leadership given by Kenya in the continent.

Executive Approach to Success

Kenya's Y2K success could clearly be seen to stem from:

- accurately defining the problem
- fully understanding the nature of the challenge
- creating a vision powerful enough to meet the challenge
- adopting a Risk Management Methodology capable of delivering the vision
- setting goals within the vision
- providing leadership to allow goals to be met
- developing appropriate relationships both within the national economy and internationally
- adherence to International Best-Practice standards at all times
- taking every opportunity for communication
- adherence to the KISS – Keep It Short and Simple – Principle

Co-Evolution – the Vital Executive Lesson Learnt

The glaring lesson that Y2K taught is that when the private sector and the public sector work together in a fully engaged manner, undreamed-of possibilities are opened up for the country's future. This is a phenomenon known as co-evolution.

In executive terms, co-evolution implies the following:

- long-term excellent performance against Kenya's own and international standards
- self-correction – the ability to know when things are going wrong and to correct them
- self-generation – the ability to find resources and build relationships to continue to develop capability and to stay ahead

The Challenge

Globally, it is now recognised that knowledge and information are critical tools for sustainable and equitable development. It is feared that the economic gap between the “knowledge rich” north and the “knowledge starved” south will increase if the knowledge gap is not narrowed or slowed down. Kenya cannot afford to remain behind if we have to successfully address the challenges of poverty and the general improvement of quality of life of our citizens.

Recommendations

In order to meet the challenges Kenya is likely to face as the 21st Century progresses, it is vital that every lesson of history is learnt. Y2K is now part of that history and the following recommendations stem directly from lessons learnt in meeting its challenge:

1. A national body, drawn from both public and private sectors be established with responsibility for ensuring that Information and Communications Technology (ICT) is made an integral and critical component of national and regional economic and social development. The envisaged body is an ICT Council.

Its remit must encompass all aspects of strategic development, regulatory framework, enactment of appropriate cyber laws, development of infrastructure and relevant public policy issues necessary to support electronic business, E-government and the entire E-future.

Judging from the likely impact of knowledge and ICT in improving quality of life of Kenyans and borrowing from recent best practices from other countries such as Malaysia, Singapore and South Africa, it is critical that the proposed Council is constituted and chaired at cabinet level.

In this context it is strongly recommended that the National Y2K Co-ordination Centre be reconstituted as an ICT Secretariat with responsibility for the permanent and continuous management of ICT throughout Kenya and implementation of the Council Agenda. The funding of the proposed ICT Council and Secretariat be drawn from the Exchequer, private sector and Kenya's development partners.

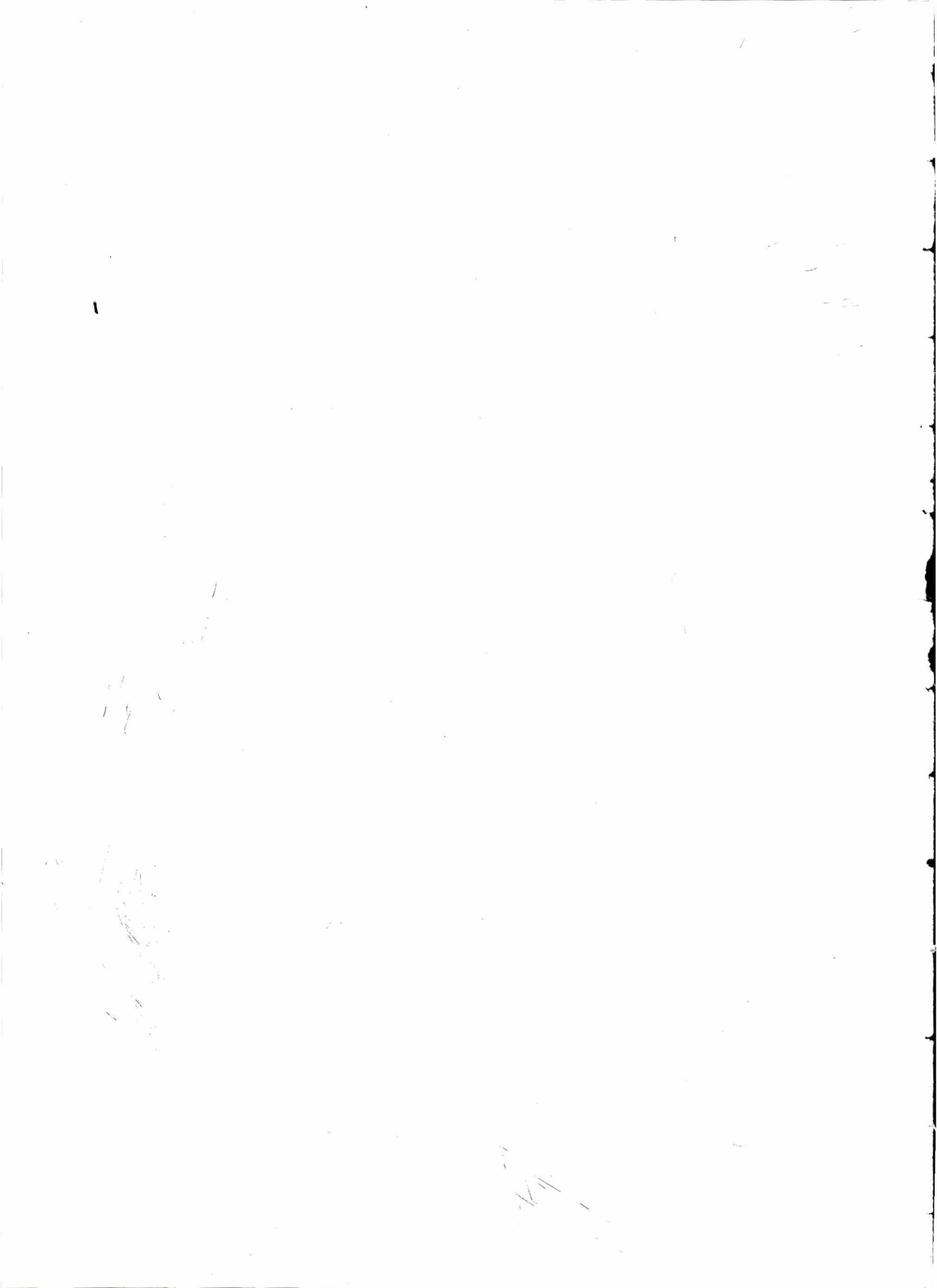
2. The Y2K management model, based on the mainstream use of risk management, of being driven by a strong vision and of using public and private sector collaboration in building relationships appropriate for the challenges faced, should be immediately adopted as the standard for managing large and complex projects throughout Kenya. Its application to such challenges as disaster management, poverty alleviation, meeting the HIV-AIDS challenge, industrialization by 2020, economic liberalisation and public sector reform programme would be of immediate and long-term benefit to Kenya.

3. National disaster management arrangements should be reviewed in the light of Y2K experience. The objective must that loss of life and damage to property and infrastructure arising from disaster, man-made or natural, within Kenya or the region are kept to an absolute minimum and that recovery is achieved within shortest time possible.
4. The Public Sector should initiate accelerated upgrading of its capacity, both human and technical, to catch up and be at par with the private sector. This is crucial if Kenya is to join the digital society and the E-future. The Y2K management model referred to above should be used in the cost-effective delivery of this enhanced capacity.

Executive Conclusion

Classically, on account of the uncertainty surrounding it, Y2K was seen throughout the world as a 'risk season'. The fact is there is no such thing as a 'risk season'. Risk is always present, there is always uncertainty. That uncertainty can be managed and its impact mitigated is the lesson now fully understood.

Despite some schools of thought negatively labelling Y2K a 'hoax, Kenya's Y2K success was, and will forever remain, an absolute national triumph. It was the direct result of outstanding leadership, organization, planning, collective commitment to a vision and the risk-managed application of focused resources.



I. K E N Y A: PROFILE

Geography

Kenya, more or less bisected by the equator line and strategically located in the eastern coast of the African continent, has an area covering 569,259 square kilometres – about the same size as France and roughly twice the size of the United Kingdom. The dominant physical feature is the Great Rift Valley, which bisects the country from north to south.

The country shares common borders with Somalia, Ethiopia, Sudan, Uganda and Tanzania.

Climate

With the Equator running through the middle and the country's altitude ranging from sea level to 5,199 meters, Kenya enjoys a varied climate ranging from tropical to temperate with two rainy seasons spanning the periods of March – May and October – November.

Population

Kenya's total population is currently approximately 30 million which is both multi-racial and with various ethnic groups of diverse cultural backgrounds. Nairobi, the capital of Kenya, has an approximate population of 3 million. Other major urban centres include Mombasa (Kenya's main port and holiday resort on the Indian Ocean), Kisumu (on the Lake Victoria), Eldoret, Nakuru and Thika.

Language

Kenya's official language is English while the national language is Kiswahili – a mixture of Bantu and Arabic. There are also a variety of local languages and dialects.

Political Situation

Kenya has been a republic in the Commonwealth since independence in 1963. Executive authority is vested in the President, who is directly elected and the legislative authority is vested in the single chamber National Assembly.

Kenya is a multi-party state with over 20 registered political parties. Presidential and Parliamentary elections are held every 5 years and presidential terms are currently limited to two. The debate on the constitutional review is presently in progress.

Kenya is a member of the East African Co-operation, the Commonwealth, the United Nations, the World Bank, the International Monetary Fund, the Organisation of African Unity (OAU), and an associate of the EEC as a signatory to the Lome Convention.

The Economy

Kenya runs a mixed economy and has the potential to be dominant in the region and an engine for regional growth.

Agriculture, the main sector of the economy, being the largest source of employment and foreign exchange earnings, contributes a quarter of the total GDP, while manufacturing, the second most important sector and the strongest in East Africa, contributes about 13%. The other important sector is trade, restaurants and hotels contributing about 12%, with tourism being second in foreign exchange earnings after agriculture.

Infrastructure

Kenya has a well developed infrastructure in the sub-region, with an extensive road network, three international airports at Nairobi, Mombasa and Eldoret, a national air carrier – Kenya Airways, the port of Mombasa, which with its excellent harbour, acts as a gateway to the sub-region and a railway line connecting Mombasa and Kampala via Nairobi. A number of measures are being implemented by the Government to rehabilitate the infrastructure. These measures include the on-going rehabilitation work on roads. Two major players in the power and telecommunications sectors are also undergoing the restructuring programme, while plans are underway to streamline operations at the port of Mombasa to improve efficiency and delivery of services.

The General Business Climate

Kenya has enjoyed a stable government for more than 35 years of independence and has made a strong political commitment to promoting

private-sector investment, both local and foreign, to sustain economic growth. Over the past decade, the Government has introduced liberal market-oriented policies and reforms to improve the investment environment. Exchange controls have been removed, prices de-controlled, import licensing abolished, interest rate regimes de-controlled and major privatisation and parastatal reform programmes instituted.

Trade and Investment

A number of incentives to promote foreign investment are being implemented. The introduction of tax holidays under the export processing zones and elimination of restrictions on the repatriation of profits was aimed at promoting foreign investment at the Nairobi Stock Exchange which however is currently limited to 40% of the value of floated shares.

Traditionally, the larger share of foreign capital inflows originates from the European Union countries, however South Africa and some Asian economies are gaining importance. Some of the foreign direct investments are in form of invested profits by multinational companies.

As far as trade is concerned, Kenya's major trading partners are African countries, which account for 47 % of its exports and 9% of imports, followed by European Union countries which account for 30% of exports and 33% of imports. Other trading partners are the Far East and Middle East Countries, which account for 13% of exports and 23% of imports.

Kenya's other Potentials

Since independence, Kenya has enjoyed political stability that has enabled it to emerge as one of the strongest economies in the region. The varied agro-ecological zones and the unique tourist attraction sites also provide a great potential for the economy.

II. THE NATURE OF THE Y2K CHALLENGE

Background – the Reality of the Challenge

In the computer world, a *bug* is a programming error, so Y2K was never a *bug* in the strict sense of the word, thus making the term *Millennium Bug* a misnomer. Y2K was more accurately described as a time-bomb. Its trigger would be that tick of the clock with which 1999 became 2000. This then was Y2K's immovable deadline.

In the shorthand universally used to describe the challenge this posed, Y stood for Year, 2 stood for two and K stood for thousand as it does in kilometre or kilowatt.

Within the Electronics and Information Technology industries, it had been known for many years that the date change would pose a potential, very real, threat to the normal operations of automated equipment and computer systems wherever they were used. In realistic terms this meant every sector of every economy world-wide.

Modern economies are run almost entirely using the systems that Y2K put at risk. And the firms, institutions, individuals and families making up those economies rely absolutely on them for all the utilities and services which their lives and livelihoods depend upon.

Thus, despite having its roots in technology, Y2K was a problem of world-wide operational and business continuity. Since the modern world is entirely the sum of its inter-dependent parts, Y2K thus threatened the large-scale, macro-continuity of nations and international trading blocs by threatening the small-scale, micro-continuity of individual firms and institutions.

The Y2K challenge was to ensure the continuity of the inter-linked networks of demand-chains and supply-chains which covered the entire globe. The simple and essential Y2K challenge therefore was to do everything necessary to ensure that life in all aspects went on as normal when the millennium date rolled-over.

Roots of Y2K

Y2K was a threat created simply because of a money-saving 'shortcut' used extensively in early computers and microchips. Back then, to conserve expensive memory space, programmers used only two numbers to record the year. So "75" for example implicitly meant 1975. Likewise, every other two digit year carried an implicit and invisible "19" in front of it. Technology of this type was therefore limited exclusively to the last century. This meant it was fine until we came to that point in time where the twentieth century ended and the twenty-first began.

At "99", using the decimal system of counting, the capacity of two digits is exhausted. The next number in the logical sequence requires three digits. If three digits are not available, which of course they were not in technology limited to the twentieth century, the question then became: what are those twentieth century computers and microchips going to make of a date of "00"? They could think it means the year 1900 which could then lead them to generate all sorts of incorrect data, or perform their operations unpredictably, or even to shut down completely. Nobody knows for certain how such machines will behave.

The Definition of Y2K Compliance

Globally, there were a number of definitions of the term "**Year 2000 Compliance**" or "**Year 2000 Ready**" in use in various industries, Y2K Action Groups and IT companies. To avoid confusion and to provide a reference point for Kenya's Y2K preparations, the adopted standard was by the British Standards Institute (BIS).

This challenge was formally captured in the internationally accepted Y2K rules set out by the British Standards Institution Committee BDD/1/-/3, the full text of whose findings appears as an *appendix* to this report. Briefly, the rules state that Year 2000 conformity shall mean that neither performance nor functionality is affected by dates prior to, during and after the year 2000.

In particular, four rules apply:

1. no value for current date will cause any interruption in operation
2. date-based functionality must behave consistently for dates prior to, during and after year 2000

3. in all interfaces and data storage, the century in any date must be specified either explicitly or by unambiguous algorithms or inferencing rules
4. year 2000 must be recognised as a leap year

Uncertainty lay at the heart of Y2K. Managing that uncertainty in accordance with the above rules became the essence of the Y2K challenge.

Due diligence

The concept of *Y2K due diligence* provided an additional dimension within which the challenge had to be managed. And it needed to be made absolutely clear at the outset that due diligence extended far beyond “simply” ensuring the compliance of IT systems.

The National Y2K Co-ordination Centre’s definition sums up due diligence:

Should Y2K action be brought *post facto* against any organisation, the only defence, will be the ability to show – by documentation, plans, test results, standards and best practice procedures – that everything that can reasonably be expected to have been done has in fact been done and that all known risks have been addressed.

The closing part of that definition – *and that all known risks have been addressed* – is a statement of the exact nature of the challenge. Risks are any events which, if they occur, have the capacity to prevent a goal being reached.

Meeting the challenge required firstly, reducing the probability of a known risk event actually occurring wherever possible. And secondly, reducing the impact of a risk event if and when it strikes. Both of these processes took place within a context designed to enable national life to get back to ‘normal’ operations as quickly as possible in the event of disruption.

Continuity Planning involves the management of all known risks to ensure that, at all times and in all circumstances, an organisation can continue to operate to at least, some minimum, pre-determined level.

Due diligence recognizes that by its very nature, risk can never be fully known and never fully guarded against. It takes this into consideration with the notion of reasonability.

The challenge for the National Steering Committee was to deliver Y2K continuity throughout the national economy in accordance with both the international rules and the requirements of due diligence.

The Final Risk Profile

By 31st December 1999, Kenya's national Y2K risk profile had been managed down to four key risk triggers, any one or combination of which would trigger continuity arrangements. These were:

1. The loss of a life-critical national utility – water, electricity, telecoms, etc.
2. The domino-effect of several incidents, in themselves trivial but which in combination create a strategic problem
3. A Y2K event in another country spilling over into Kenya
4. Strange and unusual social behaviour leading to civil unrest

The Actual Event

Thanks to the vast amount of work that had been done in preparation for meeting the challenge, the resources committed and the energy and the talent of the people involved, the actual date-transition event proved smoother than could have been hoped for. This was a triumph for the systematic way in which the challenge had been faced. It was also a triumph for foresight and leadership, for planning and for an understanding of priorities and inter-dependencies.

Ironically - and inevitably - this very success gave rise to accusations that the whole Y2K enterprise had been a money-making hoax from start to finish and that the 'computer industry' had somehow conspired to pull the wool over the eyes of the world. It is sufficient to say at this point that no one who has had exposure to the work involved in meeting the challenge would go along in any way with these accusations. And to the inevitable response, *'well, they would say that wouldn't they – after all, they are all part of the same conspiracy'* the reader must judge for herself or himself.

Interestingly though, the hoax accusations arose only *after* the smooth transition to the current year. Prior to that, the challenge had been complicated by the need to deal with a spate of irresponsible scare stories and rumours which were given prominent exposure in the media simply by virtue of having 'Y2K' tagged on to them.

Background for Hoax Accusations

In its short life, Y2K became a 'brand' and rapidly achieved what every brand craves - instant and world-wide consumer recognition. The availability of such a 'brand', which was public property, meant anyone was free to use and exploit it for whatever purposes they chose. Defending 'Y2K' in the face of such exploitation exacerbated the challenge considerably.

Y2K momentum built up to an unprecedented extent as the great day approached. It made for strange times. And strange times invariably give rise to all sorts of apocryphal stories. Also, in the case of Y2K particularly, they give rise to some strange and unwieldy acronyms. Perhaps the strangest of these was the widely circulated Y2K-TEOTWAWKI standing for '**Y2K - the end of the world as we know it**'. This is an extreme but fairly typical example of the sort of Y2K horror stories which had to be managed as part of managing the overall challenge of ensuring life went on as normal.

The challenge of guarding against strange and unusual behaviour on the part of the general population – what came to be known as ensuring 'social-life as normal' - was not helped by such stories. Extensive press extracts are contained in an *appendix* to this report.

In addition to horror stories, there was a growth in Y2K apocrypha. For example an internet Y2K Disaster Resource Guide – one of many such helpful sources - carried a banner headline bearing the quote "***This code will not work come 1/1/00. I hope that's not a problem***". This purports to be a programmer's note left in a program written in the nineteen-sixties. (Programmers traditionally refer to their work as 'coding' and the end product of their work as 'code', hence the reference to code in the quote).

Apocryphal or not, that programmer's hope proved forlorn because Y2K most certainly *was* a problem. What is more, it was a unique, never-before-never-

again problem. Hence the strange times. For the purpose of this report, there is a need to briefly recount what was at the heart of it.

Data Integrity in the Information Age

We live in the information age. An age in which accurate and timely information is what keeps the world going round. Computer systems – what we now more commonly call IT or Information Technology – used to be called Data Processing. As the name implies, Data Processing received data, and processed it in some way to produce information. Data was the key input. It still is. Data integrity was vital. It still is. This fact alone gave rise to the guiding principle that accurate information requires accurate data. Hence the famous law *garbage in – garbage out* became the cornerstone of the entire industry.

At a time when people's lives have an almost total dependency on electronics and the various outputs of information systems, Y2K, through the threat it posed to data integrity, was a significant problem and a very real threat. (Discussions about whether, on balance, this reliance is a good or bad thing proved to be another of the many Y2K socio-philosophical and religious distractions which had to be managed as part of the bigger challenge.)

Meeting the Challenge – four dimensions

At a management level, meeting the challenge involved understanding the nature of the risks that individuals, firms, institutions, governments and nations were confronted with as a result of Y2K. The challenge was only able to be addressed when risks were understood in this way. The Y2K Management Model, contained elsewhere in this report, describes the process by which this was done.

The process enabled critical aspects of organisations which have to be managed in the face of those risks, to be identified.

The challenge was seen to have four logical components which were common to every organisation regardless of size, sector or structure. These were:

1. delivering managed stakeholder value
2. delivering managed business or service operations
3. delivering managed customer expectations

4. delivering managed people (mainly employee) expectations

Delivering Managed Stakeholder Value

Stakeholder is a broad term which incorporates everyone who has some interest in, or stake in, an organisation. Employees clearly are stakeholders in the organisations which employ them, so too are their families, the owners, directors and shareholders. Investors are stakeholders and by extension so are members of pension funds or investment funds with savings in the organisation. Creditors, people to whom the organisation owes money, are also obviously stakeholders, so too, in a less obvious way, are debtors, people who owe the organisation money. Frequently, but not in all cases, debtors and creditors are part of that vital business relationship which extends stakeholderhood throughout the economy – the customer and supplier chain. Ultimately, everyone is someone's customer and thus a stakeholder.

Delivering Managed Stakeholder Value to an employee essentially means he or she still having a job to go to, still having work to do and still having the income which is the reward for that. To the employee's family it means they can still pay their rent, eat decently, dress properly and that kids can still go to school. For all the places where the family shops, it means they still have customers. Stakeholderhood throughout the customer-supplier chain works on this basis of mutual interdependence.

Investors, leaving aside their role as employees and customers, will have a different view of value. They will be concerned that the resale value of their investments or the cashflow from their savings is being maintained. Thus the whole notion is often referred to as shareholder value. The value of a shareholding reflects two things – the actual share of the assets the shares represent and the future cashflows from dividends. Maintaining shareholder value is top priority for boards of directors of publicly quoted firms. Weaknesses in this area can lead to the organisation being taken over by rivals, effectively ending the careers of the board members. These are high stakes and Y2K posed an additional threat.

In the public sector the onus is on good governance and fulfilling responsibilities to the tax payer and the country. Whatever the organisation, whether public or private, directors and management had to do a number of things in order to properly safeguard stakeholder value in the face of the Y2K

threat. They had to take legal advice on the extent to which value is exposed to threat. They had, wherever possible, to insure, or otherwise take steps to discount, offset or reduce that exposure. Since this can only ever be done through Risk Management, they had therefore to ensure there was adequate capacity for this. On top of everything else, they had to be able to prove due diligence in their defence of the threat to stakeholder value Y2K was known to pose.

This was a major management challenge in both the public and private sectors.

Delivering Managed Business or Service Operations

There were two clear dimensions to this part of the Y2K challenge. The first involved managing the Y2K threat to the processes and systems on which key business operations depended. The second involved managing the customer-supplier chain without which there is little point in doing anything.

It was in the technical areas of processes and systems that most Y2K work was originally focused before the real scope of the challenge became apparent. Take computer programs for example. First impressions were that in organisations which had developed their own software, this would pose the biggest threat. Further investigation however revealed that no matter how important this is, it was only a small part of the work that had to be done. The same findings applied with proprietary or packaged software.

The explanation for this provides a further insight into the nature of the challenge that firms faced from Y2K.

A computer program is really nothing more than a series of instructions which the machine carries out sequentially, line by line, using data which can be input in a number of ways. The language in which programs are written can vary depending on their age, their application and the make of computer hardware they run on. A system is a collection, called a suite, of different programs, brought together to do a particular job and to run in a particular environment, whose ages, and even exceptionally, languages might all be different. They are likely to have been written in several different places, by several different teams of people, under several different regimes of standards,

under several different operating systems and for several generations of hardware.

Such software collections are often referred to as legacy or cherished systems. Many organisations have woken up, over the past 1-2 years or so, to the fact that their critical operations, and by extension their futures, are totally dependent on such legacy systems. Y2K opened their eyes to the potential consequences of this. Not the least of which consequence is the constraint on future possibilities for growth posed by having to run according to what their software lets them do rather than what the market or their business strategy requires them to do. Y2K uncovered many such unexpected surprises.

Many legacy computer programs had to be checked line-by-line and remedial action undertaken for all occurrences of non-compliant dates. One common way of dealing with two digit year dates is to use windowing as what is called an 'inferencing tool'. This is simply a way of telling the software to infer the century from the 'window' the year is in. So a 40-39 window would say that for all year values of 40 or higher infer 19 as the century value and for all year values of 39 or less infer 20.

Software engineers, programmers, systems designers and testers, highly expensive resources all, were kept busy handling the challenge in this and similar ways (as, in all likelihood, will a future generation when the windows run out). Many firms who at the beginning treated Y2K as purely a technical problem later paid the price of having invested expensively in rehabilitating legacy systems when it would have better served their business needs to replace them. Unfortunately their return on investment targets now require them to run with these constraining systems for the foreseeable future.

Thus by solving an incorrectly defined problem – that is, by treating Y2K as a technical rather than a business problem - many organisations actually compromised stakeholder value. The high-cost of equipment and cheap labour which gave rise to the problem, have undergone a complete reversal so that today, technology is comparatively cheap, and people, particularly those with the right skills and experience, are comparatively if not absolutely, expensive. When the competitiveness and globalisation of today's business world are factored into this equation there is a clear requirement for software and systems which are flexible and which accurately serve business needs. Electronic commerce – or E-commerce as it is known – can become very

complicated when firms interchanging information are using different inferencing rules. Firms (and indeed national economies) who took the right perspective on Y2K will continue to gain competitive advantage from their experiences. Those still adhering to cherished software may not. History, whoever writes it, will decide.

Not all business operations depend on the sort of software described above. Some, such as automated production processes, depend on equipment and machinery which is controlled by microchips. This has come to be called embedded technology and it too demanded remedial action be taken to manage potential failures in date-dependent functionality. The remediation process is similar to that for software except that in the case of embedded technology, few firms are likely to have built their own equipment. This means that finding out exactly what is inside the electronics involved referring back to the manufacturers. This led to all sorts of complications and made obtaining accurate information on which to base business decisions even more difficult than it is under normal circumstances. This applies as much to comparatively simple equipment such as PABXs, Fire Alarms and Lifts as it does to a fully automated factory system operated by robots.

The Y2K lessons drawn from this focus on the importance of the customer-supplier chain (Lessons Learnt are dealt with elsewhere in this report). There is a school of thought which suggests, now that 'third party management' has been born, it will be difficult to ever go back to some of the worst excesses that have traditionally plagued this aspect of business. Y2K brought home the fact that absolute interdependence is regardless of how big a firm is and regardless of the industry it is in. It also made firms face up to the sometimes unpalatable fact that they are actually only in business because they have customers. Worse still, that they cannot actually serve their customers without buying things from their suppliers. In some ways, when it comes to managed business operations, history will record, Y2K was like a breath of fresh air.

Delivering Managed Customer Expectations

Y2K highlighted the previously unacknowledged fact that all of us, whether as individuals, families, organisations or nations, are customers. As such we all have some expectations about whatever it is we want to buy and wherever it is we want to buy it. Whether it is an airline ticket, a computer system, a newspaper or the family groceries, it is vital that service levels and customer

expectations are aligned. In competitive markets it is through this process that advantage is gained and market share won and secured. At times of uncertainty such as Y2K was, customers, whose business may depend on their ability to keep buying from a supplier, need to know what that supplier's capabilities are. This particularly applies to utilities organisations delivering power, water, telecommunications, petrochemicals and infrastructure. The process requires communications and sharing plans so that no additional surprises pop out of the woodwork at the least opportune time. Everyone in the customer-supplier chain must be able to plan their operations and set their expectations accordingly. Ultimately, everyone depended on everyone else surviving Y2K.

Y2K extended this challenge from firms who considered themselves already to be close to their customers - for example a firm installing a computer system and adapting the customer's data - through to a manufacturer who never sees the end consumer. It also took in firms like supermarkets who never know the names of their customers. Y2K rules were the same for all - communicate in order to set expectations at a realistic level. To be able to do this firms realised that they had to execute the risk management referred to above. This provided the basis on which contingency arrangements could be built. Since it soon became clear that no firm was a Y2K island, customers and suppliers were involved, as much as was practically possible, in this process. That way, firms knew there was a good chance they would all survive and still be doing business long after Y2K was forgotten about. Those who did so will have a say in writing the history of the Y2K challenge as well as absorbing its lessons.

Delivering Managed People (mainly employee) Expectations

A further little-acknowledged aspect of life which Y2K brought into the light of day was that everything ultimately depends on people. Meeting the Y2K challenge itself was no exception. Inevitably, the more motivated, better-led and better trained people are, the greater the chances of success in any enterprise. Y2K proved to be no exception.

Contingency plans for example, require someone, often a named person, to do something at some given time or when some given conditions apply. For plans to be effective, and actually do what they are supposed to do, it helps if the person or people concerned know exactly what they are expected to do, if they

know why they are doing it and if they have had all the necessary training. To assure Y2K success, people at all levels throughout organisations had to be involved in every stage of the planning process from beginning to end. Getting this to happen was itself an extensive challenge since in many organisations it represented a radical departure from the norm.

A further Y2K challenge grew out of the need for organisations to draw up a vision and values statement, which precisely described its Y2K stance, and then to communicate this throughout the organisation and the extended customer-supplier chain. This not only raised Y2K awareness, it made absolutely clear the objectives of every individual piece of work and the role in operational continuity which everyone had to play.

It is a management truism that people work better when they feel comfortable about what is expected of them. Setting and maintaining expectations of comfort levels thus became more and more a factor as Y2K drew nearer and uncertainty and rumours abounded. In that context, properly managed people expectations became number one priority for many organisations. This extended to vacation planning, availability scheduling, shift rosters and feeding and rest arrangements all being kept up to date and communicated. It was found that if people were required to be at work across the period of the date-change when they might have expected to be on holiday, then the sooner these things were negotiated with them, the better. If the organisation was expected to provide food and sustenance during working times, contingency arrangements were extended to making sure there were adequate provisions for this.

The Challenge of Interdependence

The four dimensions of Y2K dealt with above are all interconnected and interdependent. Not only within every organisation but throughout the economy. They are like spokes in a cartwheel – take any one of them away and the cart is stuck.

For the National Steering Committee the challenge was to ensure the wheels of Kenya's economy kept turning smoothly throughout the time of great uncertainty. As the record shows, this challenge was most admirably met.

III. KENYA'S Y2K MANAGEMENT MODEL

Vision Prevents Failure

A history of failures should be enough to prove, if anyone needed proof, that large and complex projects are notoriously difficult to manage with any degree of success.

One of the reasons why large and complex projects perennially fail to turn out the way they were intended is lack of vision. There are lots of other reasons but these almost all stem from the absence of clear vision. Without vision, leadership is impossible, objectives and goal-setting become meaningless and projects inevitably lose focus, momentum and contact with reality. Failure then becomes inevitable.

Given that no-one would choose to be associated with failure, it is a sad fact however that complex projects have often been embarked upon with the unstated expectation that they will fail and when they eventually fail, key people – whose commitment is vital for success - distance themselves. Failure thus becomes a self-fulfilling characteristic of large and complex projects.

Underpinning Y2K Success

Kenya's Y2K programme is a shining example of a successful large and complex project.

It followed a classic risk management methodology and was entirely vision-driven. In simple terms this meant throughout the Y2K challenge, the vision was strong enough and totally committed to by all the people involved, that it provided a focus for every piece of work and every informed decision.

The vision was totally grounded in the reality of life in Kenya. Throughout the life of the project it provided a focus for the perspective in which the challenge was seen and managed.

Kenya's Y2K Vision

The vision which guided Kenya's Y2K programme was derived from answers to four fundamental questions which every head of family in the country had the right to expect to be answered:

In Y2K, what is going to happen to:

- *my family's home-life* – TV, radio, electricity, water, shops, food, telephones, etc?
- *my family's health* – hospitals, emergency services, treatments, surgeries, etc?
- *my family's work and income* – the workplace, the infrastructure, banking and financial systems, insurance, pensions, savings, transport, fuel, etc?
- *my family's security* – civil order, property rights, the police, national defence, etc?

In response to these questions, the vision of the National Y2K Steering Committee and the National Y2K Co-ordination Centre became:

Individual residents and Kenyan families have a right to expect that everything possible is done to ensure their well-being and everyday lives are as little disrupted as possible by problems within computers and automated systems arising from the date change at the dawn of the Year 2000.

The vision guided every action of the Centre and formed the basis of communication with the Kenyan public. It is represented in **Figure 1** below.

National Family Life as Normal

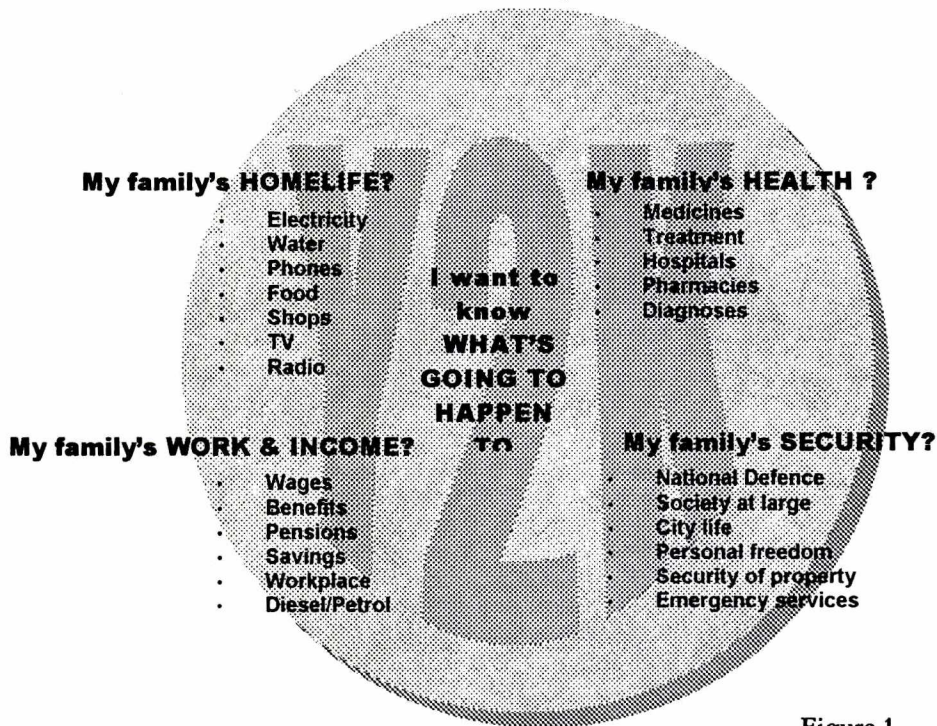


Figure 1

Delivering the Vision

At its most simple, delivering the vision had two crucial requirements, the management of which formed the basis of all activities. These were:

1. It required Kenya as a whole to be 'as normal' across the period of the millennium date-change. This required at least nine significant sectors of national life themselves to be 'as normal'. Kenya 'as normal' is represented in **Figure 2** below.

Circle of National Life

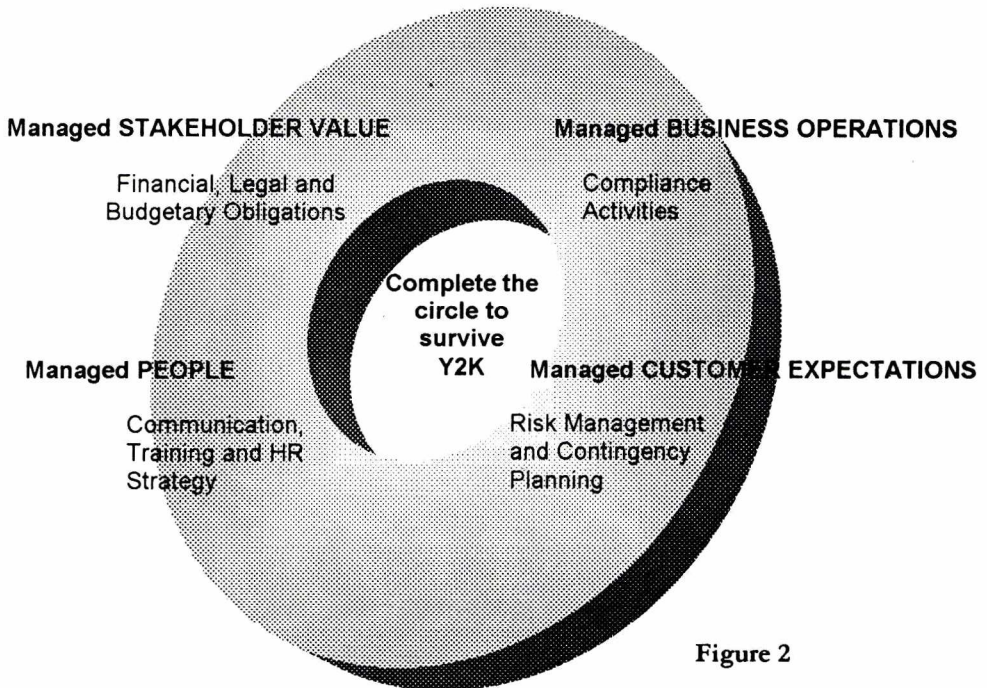


Figure 2

2. It required every component within every sector – every business unit, enterprise, government department, parastatal, institution – to satisfy the requirements set out in **Figure 3** below to a level to which proper due diligence could be established.

Kenya 'as normal' requires

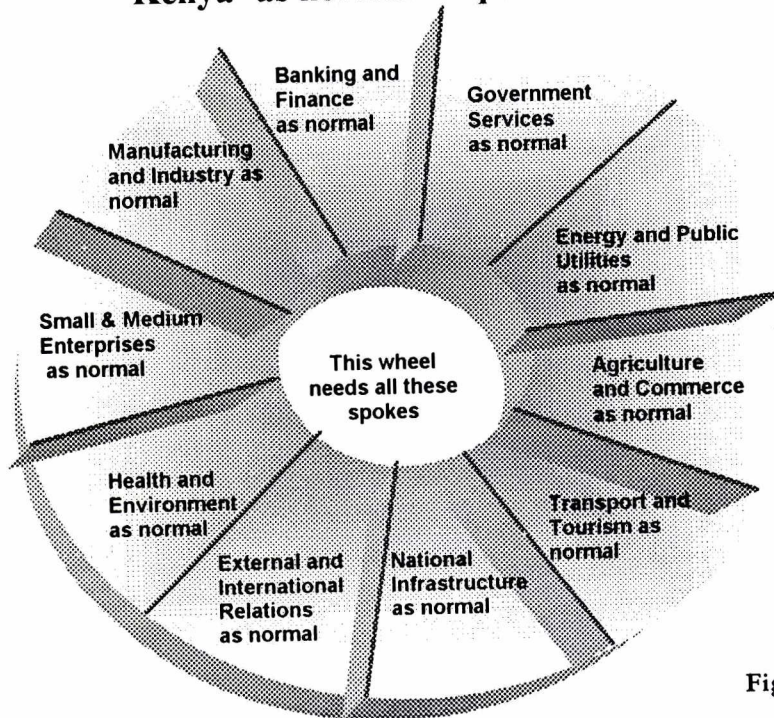


Figure 3

Delivering Kenya 'as normal'

Delivering the vision of 'life as normal' required every government department, every parastatal, every organisation, public and private, large and small, and every business delivered the same vision to their stakeholders. In terms of the national economy this equates to:

- Government Services as normal
- Banking, Insurance and Finance as normal
- Energy and Public Utilities as normal
- Travel and Tourism as normal
- Manufacturing as normal
- Small and Medium Enterprises as normal
- Agriculture and Commerce as normal
- Health, Safety and Environment as normal
- National Infrastructure – social order - as normal
- International Relations as normal

The implication of the vision was that *no additional problems* would arise from Y2K which would adversely affect Kenyan families' home-life, their health, their work and income, or their security.

Ensuring this therefore required every aspect of national life to function 'as normal'. It is within this 'as normal' context that the country's readiness status was judged.

These requirements provided the rationale for the structure of the National Y2K Co-ordination Centre which incorporated Sector Co-ordinators for all of these aspects of national life. The only exception being National Infrastructure and International Relations. These vital elements of 'life as normal' were seen to be outside the scope of the National Committee.

Delivering the Vision – the Four Dimensions of Due Diligence

This aspect of delivering the vision was seen to have four logical components which were common to every organisation regardless of size, sector or structure. These were:

- delivering managed stakeholder value
- delivering managed business or service operations,
- delivering managed customer expectations
- delivering managed people (mainly employees) expectations

These components are examined in detail in the section of this report headed 'The Nature of the Y2K Challenge.'

Managing External Y2K Risks

Y2K did not respect national boundaries, therefore Kenya's position within the world context had to be borne in mind at all times. This began with a regional role in petrochemicals, power provision, banking, telecommunications, shipping and civil aviation. Details of the activities within this context are contained elsewhere in this report.

The vision of national co-ordinators across the region was to promote East Africa, particularly to financial and tourism markets the world over, as a 'Y2K safe haven'.

Delivering 'social order as normal'

National contingency arrangements were a vital part of Y2K planning. In particular the need to secure 'social order as normal' across the period of the date change. There were five major objectives from the outset:

1. to ensure that all the services on which social order 'as normal' depends were themselves Y2K ready
2. to identify potential Y2K-related risks to social order 'as normal' and to have appropriate contingency plans to ensure the risks are eliminated
3. to ensure that all services' separate and collective roles in delivering social order 'as normal' were understood and that all the processes, resources and infrastructure on which delivery depends continued to be available and where this was in doubt to identify necessary contingency arrangements
4. to agree on a timetable for the detailed planning, resourcing, testing and reviewing of these arrangements
5. To investigate the support which the security and emergency services could extend to the other sectors during the date-change period.

Reporting Y2K

Within the methodology, reporting was seen to need to be simple, precise and meaningful. Effective Y2K communication was seen as vital. Whether to the Cabinet, the Steering Committee, the media, the international community or to the private citizen(s), the Centre's reporting was seen as the key to success.

Reporting was also a vital part of the framework which allowed national and international decisions to be made on the basis of the Centre's derived information.

On top of this, reporting formed the basis of Kenya's record of due diligence.

Several critical results were achieved by working in this powerful way in order to deliver these crucial requirements within the time available and to the quality demanded:

- every piece of necessary work was identifiable down to the very lowest level thereby enabling an accurate and extensive analysis of gaps and weaknesses to be made

- appropriate management control was extended throughout; not simply to deliver work but, crucially, to manage risk
- with this leadership, the vision informed every Y2K decision wherever it was made and delivering the vision became the objective of every piece of work

The Y2K Roadmap

It was the Roadmap which set out the actual work which had to be done within the framework set out above in order to achieve Y2K readiness. The full Road Map documentation is contained in an *appendix* to this report.

In outline the work comprised the following steps:

- **Detailed inventory:** Every component of the portfolio was tracked down right to the program level and documented
- **Impact analysis:** The date sensitivity of each component, time, effort, cost and resources required to achieve compliance was determined
- **Conversion:** Various methods of conversion were evaluated, to decide the optimal solution in terms of business goals, time, cost and resources
- **Testing:** This involved validation of conversion and was generally the largest element of effort and cost expended during Y2K
- **Implementation:** The validated software and equipment was moved into the 'live' environment. For computer systems this involved people from the business, the user community and IT all working together
- **Post-implementation support:** It was clearly imperative that compliant systems were carried over to the next millennium without fresh non-compliance being introduced. Post-compliance maintenance and support issues were resolved here. In the non-IT context, this became known as **Clean Management**
- **Clean Management:** Once you have repaired your systems and made them Year 2000 compliant, steps should be taken to make sure that subsequent changes do not contaminate those systems with Year 2000 Bugs.
- **Contingency Planning:** A contingency plan is a carefully considered alternative to the usual way of operating or running part

of a business and is used in times of emergency or unusual operating conditions. Comprehensive Year 2000 testing is difficult, and anticipating all possible problems is likely to be impossible. Institutions therefore, must develop contingency plans in case of problems with their own systems or those of their customers or counterparts.

A Recommendation for Future Success

A risk is an event or an occurrence, which could prevent a project goal being achieved if it happened. Strategic risk applies equivalently to strategic goals. All risk is ultimately risk to delivering the vision. All risks are manageable – that is how the vision gets delivered.

Strategic risk management has been used in many contexts over an extended period of time. Properly used, it has proved to be successful in them all. It is this success that leads to one of this report's major recommendations.

All the large and complex strategic challenges Kenya faces today and in the future - the fight against AIDS, the alleviation of poverty, industrialisation by 2020, the fight against corruption, rebuilding the national infrastructure, developing E-commerce and so on – would benefit tremendously from the application of the methodology which delivered the country's Y2K vision.

Recommendations:

- 1. That from Risk Management be made the leading component of mainstream management for all large and complex projects within Kenya.*
- 2. That the country's Disaster Management and Recovery capacity be reviewed and strengthened*

Rationale:

The rationale for this begins with understanding that there is no such thing as a 'risk season'.

Risk Management simply says that if organisations embarking on projects were to devote a small portion of project resources to improving their chances of success then their chances of success will significantly improve.

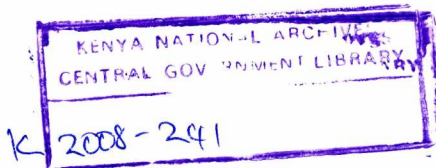
Proposal for ensuring future success:

If a continuing post-success role was sought for the equivalent of the National Y2K Steering Committee then it should become responsible for National Strategic Risk and Disaster Management. This is quite clearly the role in which benefit to Kenya, the development and trading partners would be immeasurable.

Final Note on The Y2K Management Model

It should be borne in mind by readers of this report that everything contained in the foregoing was, of necessity, required to be delivered without disrupting day-to-day operations within organisations and industry.

The Y2K vision was successfully delivered without any 'compliance overheads' being imposed on the economy. This is success indeed.



IV. LEGAL LIABILITY AND Y2K

Y2K posed both business and legal risks to Organisations and to the Country.

Whilst the source of the Year 2000 problem lies within the world of computers, its effects threatened almost every aspect of the world of business, from contracts to regulation, licensing to auditing, administration to health & safety, product liability to occupiers liability, not to mention the very integrity of the business supply chain itself. Among possible sources of litigation from Y2K failures are:

1. Litigation (under contract, and in some cases where personal injury results, under common law, or statute law) for items and services sold or provided that fail to function correctly due to Y2K.
2. Litigation under contract for failure to deliver or perform caused by Y2K related defaults of others - supply chain collapse.
3. Litigation over obligations of a maintenance agreement for equipment, where the agreement permits charging for Y2K caused failure.
4. Litigation over effect of a Y2K exclusion under an insurance contract.
5. Litigation over who pays for a Y2K fix.
6. Statutory liability e.g. against employers under Factory, Health & Safety Acts. Criminal prosecution under these Acts could follow if persons are injured.
7. Litigation relating to enforcement of regulatory requirements.
8. Shareholder action against directors under company law.

One of the terms of reference of the Steering Committee was to consider establishment of a legal desk. Litigation, of course, is best avoided. The Steering Committee's approach was to ensure that due diligence was exercised across all the economic sectors to minimise the likelihood of Y2K-

related litigation. Despite doing this, if it cannot be avoided, at least ensure it is controlled. Unlike with most litigation problems, those related to Y2K could be predicted. Planning for litigation can be looked on as really an extension of general Y2K contingency planning. Litigation, if it is not controlled and directed, could take up a huge amount of management time that ought to be available to focus on business post-Y2K.

The law has very many impacts into business relationships that could be affected by Y2K, from trader/trader within supply chains, employer/employee, regulator/regulated to manufacturer/injured consumer, etc. The domino-effect of supply chains would sap a creeping energy for litigation. So planning to avoid and control is the approach adopted for Kenya's Y2K management.

The problem with protecting and asserting one's legal rights in a Y2K scenario is that, if problems had occurred to widely disrupt business continuity, the pace and scale of claims and counter-claims would have been fast and large. The overlapping multiplicity of supply chains would mean that no litigation issue would be isolated.

The lack of legislation would make litigation more likely since history shows that the less clear guidelines and rules, there are, the more difficult it is to resolve disputes. So they are taken to court and slowly rules evolve. Y2K would in fact give an opportunity to develop clear interpretation of the law on IT issues generally.

However, if legislation were in place, disputes would still arise about interpretation of Y2K clauses, especially in insurance where the Association of Kenya Insurers, in line with the stipulations of the International Association of Insurance Supervisors, introduced the "Millennium Exclusion Clause" in March 1998. Is an event a Y2K event covered by an exclusion? It will not be easy for insurers to necessarily prove that a claim comes within the definition. In some countries, specific millennium events were covered but at high premiums.

Disputes would also arise as to what is or is not 'compliant', based on the fact that many statements have referred to 'compliant to British Standards Institute's definition' when the BSI have not defined the word (their word is 'conformity').

Worse than no legislation, is a badly drafted legislation. The Steering Committee therefore in line with other Commonwealth countries opted not to have Y2K legislation but rather to give legal guidelines based on existing law. These were published as per Kenya Gazette Notice No.7560 dated 30th December 1999.

Resolution of Disputes

Kenya had a very smooth transition over the date-change and as a result, it is expected that disputes arising from Y2K would be few, if any, and of negligible magnitude. Resolution of any likely disputes needs to be expeditiously resolved. It is proposed that this could be done through constitution of a special court or through alternative dispute resolution mechanisms available to claimants which could include: arbitration, mediation, good offices and conciliation.

V. COMMUNICATING Y2K

Awareness the Aim

Awareness, awareness, awareness was the watchword for Kenya when it came to meeting the Y2K challenge and delivering the vision of 'life as normal'. The value of the contribution the media made in creating and maintaining awareness cannot be overstated. In line with the rest of the programme, best-practice and due diligence was the fundamental consideration guiding our efforts to communicate Y2K issues to the stakeholders, the government and the general public.

Media coverage of the launch of Kenya's Y2K initiative at the Nairobi Hilton Hotel in October 1998 was the first shot, so to speak, in a campaign that lasted for the following fifteen months.

From that day forward regular press releases kept stakeholders and the general public informed on all aspects of the country's response to the challenge.

Every opportunity was seized upon eagerly to spread the word. In the early days, seminars and conferences were held targeting stakeholders in key sectors such as power, energy, water, banking and insurance, health, government services and petro-chemicals. By early May 1999 a dozen of these had been held as well as a number of similar regional gatherings. In addition to Y2K stakeholders, the press and broadcast media were invited. Widespread coverage resulted and awareness rose. Street banners, posters, a millennium choir and brochures were also used during this period.

Y2K awareness and communication since February 1999, both in the electronic and print media was consistently sustained.

Y2K general education programmes on radio were aired for a period of four months from September through December 1999.

Award-winning Radio, TV and the Press

A weekly fifteen-minute radio programme, entitled "*The Millennium Bug*" targeting the rural audience was aired to demystify the Y2K phenomenon. It ran for four months and was sponsored by NY2KCC.

In September 1998, Insurers advertised Y2K Exclusion Clause.

In Mid 1998, the Daily Nation Newspapers presented Y2K awareness articles.

In December 1999, the programme won the '***Most Informative Radio Programme***' award from the Computer Society of Kenya at a ceremony held at the Hotel Intercontinental.

Post-Y2K programmes, covering events around the roll-over period, were scheduled to go out on KBC radio during January and February 2000.

Awareness within the business communities throughout Kenya's urban centres, together with their "Y2K education" was established and maintained through a series of articles carried by the Daily Nation Newspapers. Entitled '***The Millennium Bug Column***' it ran from March through December 1999.

The series took readers through the entire Y2K roadmap, from describing the exact nature of the problem, through inventory taking right on upto contingency planning and event management. It proved very popular indeed and contributed greatly to delivering 'life as normal'. This column also won a Computer Society of Kenya award for the Daily Nation.

The famous KTN TV '***Millennium Bytes***' messages targeting stakeholders and viewers alike, but with a particular appeal to people running small and medium enterprises (SMEs) were run, sponsored by NY2KCC, over the seven months from May through December 1999.

A particularly well-researched television programme, a production of NY2KCC, covering health, banking, transport, commerce and tourism was shot and aired by KBC television. It was very well received.

Another series of TV messages in which personalities from critical sectors declared their Y2K readiness was run in the month of December 1999. This

went out on both KTN and KBC TV. These particular messages, coming as they did from the top Y2K managers in various organisations, helped allay the fears of the general public as the clock raced towards the midnight of the last millennium.

Y2K as a business survival issue was given added weight of importance when TV interviews involving the NY2KCC Director, members of the Steering Committee and other personalities, were conducted on both KTN and KBC TV. Of particular value were the '*Professional View*' programme on KBC TV and the '*Business Weekly*' programme on KTN TV.

The NY2KCC Director and staff were also extensively interviewed by a variety of foreign correspondents, notably BBC World Service, Radio Netherlands, Canadian Broadcasting Corporation, TV International, Japanese TV and French Radio's *Service Afrique*.

Many other Y2K interviews were held with local media firms including East African Newspapers and FM radio stations. All these interviews help to underline the deliberate efforts made by the Centre in the management of the Y2K problem and the need for the public to know.

Reporting Kenya's Status to World

Two full-colour Kenya Y2K status reports were produced and distributed by the Centre in October and December 1999. These took the form of magazines. Targeting the business community in Kenya, foreign embassies based in Nairobi, the Ministry of Foreign Affairs overseas missions and the international donor community, these went a long way towards letting the world know Kenya's readiness status.

The Website of the National Year 2000 Co-ordination Centre: www.y2kkenya.go.ke

Alongside South Africa and Botswana, Kenya took the lead on the African continent in providing comprehensive country-specific information to the world using the World Wide Web. The NY2KCC Website was launched on 20th May 1999 and over the period leading upto 1st January 2000 was immensely successful.

Its design was simple and uncluttered with plenty of white space around text, buttons and pictures. The colour scheme of green, red and black echoed the Kenyan National flag. Navigation around the site was kept as simple as possible with all sections being accessed directly from the home page. Changeable information was held on a database that was easily kept up to date by staff at the Centre.

Pages on National Initiatives, Managing Y2K, Company Reports, Sector Reports, Resource Centre and Solution Providers provided management and technical information and pages on Y2K Defined, Legal Guide, Events, Press Releases and Links provided more general information. The most popular pages, after the home page, were those dealing with company updates, sector reports and solution providers.

The majority of accesses to the Website came from abroad with the USA as one of the highest users of the information, second came the UK, followed by Canada and the Netherlands. Kenya itself was fifth on the list. Altogether people from over 20 countries covering all continents retrieved information about the Kenyan Y2K programme using the internet.

The International Y2K Co-operation Centre rated the Website in the top category alongside Japan, the United Kingdom and Canada.

In conclusion it is fair to say that well co-ordinated information dissemination was at the heart of the smooth roll-over.

VI. ELECTRICITY SUPPLY

The Y2K Challenge

After food and water, electricity probably plays the most vital role in the individual lives of Kenyan citizens and their families. The economy depends on uninterrupted supply of electrical power for it to thrive and prosper. The electrical power industry's virtually total reliance on modern technology made it particularly vulnerable to the Y2K problem.

Furthermore in the face of the Y2K challenge, every sector of Kenya's economy depended to a greater or lesser extent on electrical power to deliver its readiness and contingent arrangements. The sector's own readiness was therefore critical. Economy-wide communication of its readiness status was equally critical. When it came to ensuring 'life as normal' electrical power was in the front line in the Y2K challenge.

The Strategic Approach to Addressing the Y2K Problem

The Electrical sub-sector fell under Energy and Public utilities sector in the structure of national Y2K Co-ordination Centre.

Key players the country relied on to deliver continuity were:

- i) Kenya Generating Company (KENGEN)
- ii) Independent Power Producers (IPPs)
- iii) Kenya Power & Lighting Co. Ltd.
- iv) Ministry of Energy

By the time the Coordination Centre became operational in early 1999, the key players were at an advanced stage in their Y2K project - some having started as early as 1997.

Initial visits by the Sector Co-ordinator revealed that these organisations had gone through the stages of Awareness, Inventory Taking, Prioritisation, and Vendor Management and were in the stage of Remediation.

Sound project methodology had been established, using international best-practice guidelines. All the organisations had used the BSI-DISC PD2000-1 - a definition of year 2000 conformity requirements.

What became evident from the initial visits was the weakness in the management of external risks and interdependency, i.e., inward supply chain and outward supply chain. For instance KPLC depended entirely on bulk supply from KENGEN and IPPs. It also depended on its customers to be there to take up power. KENGEN and the IPPs relied totally on KPLC. Other external dependents included suppliers of Petroleum products and Telecommunication service providers.

The best strategy to deal with the problem was to organise seminars bringing together all the key players in the sub-sector and external dependents. NY2KCC organised two such seminars. Objectives of the seminars were to create:

- A forum where status information and plans could be exchanged and a common approach to issues and contingency arrangements negotiated.
- An opportunity to add a collective value and synergy to all the individual Y2K programmes which had taken place throughout the sector.

Regional Issues

Electricity Generation and distribution for the region is exposed to some additional risk through their levels of interconnection. The region has mutual dependencies, Uganda Electricity Board for instance, providing electricity to Tanzania's Lake region, Kenya and Rwanda. A Year 2000 Electricity Working Group was formed with members drawn from the Power utilities from the three East African Countries. The group worked under the auspices of the East African Co-operation and the meetings were sponsored by the Département for International Development (DFID) of UK.

The objectives of the working group were to:

- Look into cross-border level of exposure.
- Share knowledge, skills and resources where possible.

The Working Group also attracted World Bank consultancy project funding for development of contingency plans for Power Utilities in the region. The project was carried out by Y2K solutions of South Africa.

Kenya Generating Company (KENGEN)

KENGEN is responsible for generating electric power, contributing around 90% of Kenya's total demand. Their generation plants include:

- i) Hydro-electrical power
- ii) Geothermal
- iii) Thermal

Early Y2K investigations revealed KENGEN's service capabilities to be at Y2K risk in the following areas:

- i) General office environment (air conditioning, lifts, telephone exchange)
- ii) Business application systems
- iii) Local and wide-area networks
- iv) Embedded systems used in power generation
- v) Communication equipment

KENGEN's Y2K project, under the direct control of the Managing Director's office, ensured the Y2K readiness of all these facets of their operations within the time and budget constraints set by the Board.

Every piece of work was audited by an internationally recognised team of external auditors who duly awarded them certification covering all these areas on 10th September 1999.

The Kenya Power & Lighting Co. Ltd.

The Kenya Power & Lighting Company Ltd. (KPLC) is a limited liability company responsible for the transmission, distribution and retail selling of electricity throughout Kenya. The Company's mission is to transmit and distribute high quality electricity throughout Kenya at cost-effective tariffs, achieve the highest standards of customer service and to ensure the Company's long-term technical and financial viability.

Conscious of the impact Y2K could have on the national grid, customers' operations and the knock-on effect on the economy, KPLC invested in a Y2K project as part of its commitment to minimise as much as possible the possibility of disruptions in power supplies precipitated by Y2K.

A high-level Steering Committee and Technical Committee worked under the guidance of two International Consultancy firms who audited the project against the standards set by international best-practice, as it progressed.

KPLC was awarded full certification on 10th September 1999. As a result, its customers were able to make their own Y2K plans with the highest level of confidence.

KPLC Success Factors

- Being a technical company, KPLC has a highly multi-skilled manpower that was instrumental to the success of the programme.
- KPLC undertook the Y2K programme at a time when it was undertaking a re-engineering programme of its business processes and systems and much of the computer software and hardware acquired was Y2K compliant.
- All critical components and systems found to be non-compliant were upgraded, retired or replaced between December 1998 and February 1999. This process was also validated by Embedded Systems External Consultants in March 1999.
- External Consultants were commissioned to validate the processes and conduct audit checks on components and systems. This was completed on 9th April 1999.

Tasks Undertaken

Work involved tests, upgrades and validation on:

1. Embedded systems (electronics, metering, protection relays, communication systems, test equipment, office equipment and Supervisory Control and Data Acquisition (SCADA) systems).
2. Information Technology (IT) Systems (all networked sites countrywide, servers, operating systems, application software and desktops) and was completed by 12th April 1999.

Management of Roll-over

To ensure that Kenya's power supply was in no way compromised on the night of roll-over, KENGEN and KPLC developed an Emergency

Preparedness Plan (EPP), comprising contingencies to address any unexpected hitches.

Emergency teams were organised and drilled on their responsibilities. Communications on the day were channelled to an Emergency Preparedness Room (EPR) at the National Control Centre. EPR in turn was in communication with the Duty Manager who was stationed at an emergency Briefing Room at Stima Plaza from where relevant information was to be made available to all interested groups mainly customers and the Press.

The National Control Centre was in constant touch with KENGEN's power stations and the Independent Power Producers (IPPs) in order to monitor power supply. Operational and senior management Staff were strategically placed during this period to monitor and address any problem that would arise.

Roll-over Period

All systems rolled-over successfully and power supply was maintained throughout the country.

Challenges

The biggest challenge was experienced when dealing with embedded systems due to:

- Very high dependence on foreign Vendors and Suppliers
- Lack of local expertise
- No spare capacity for testing
- Dealing with equipment still in circuits
- Lack of documentation and proper test procedures

The electrical sub-sector rolled over to year 2000 successfully and business continuity is ensured. As a result of facing the Y2K challenge, new skills have been learnt that will be useful to handling future projects, in particular those involving IT. Emergency preparedness plans, which were never documented, have now been properly documented and tested.

KENGEN and KPLC are concentrating their efforts in ensuring that all its systems remain secure thereby ensuring continued service to their customers.

VII. TELECOMMUNICATIONS AND Y2K

The Significance of the Challenge

Telecommunications as a generic term takes in fixed and mobile telephones, computer data and transmission systems, video, radio – what has come to be called multi-media –the World Wide Web and Internet services.

Communication infrastructure represents a huge investment and is a national asset. Directly or indirectly it plays a part in practically every business transaction ever carried out. It is almost impossible to imagine what the world would be like without telecommunications.

Kenya's Key Players

That the country and the region enjoyed 'telecoms as normal' against the immense uncertainty of Y2K is largely thanks to the efforts of Telkom Kenya Limited's (TKL) Y2K team.

TKL is the major telecommunications service provider in the country. It has a national capacity of approximately 400,000 lines, with up to 60% of the customers located in Nairobi. It has 18,000 employees, of whom more than 500 are the specialised engineers who took the responsibility for delivering Y2K readiness. TKL provides connection services to 17 regions within the country and operates an Internet Backbone available to Internet Service Providers (ISPs). Various other countries including Tanzania, Burundi and Uganda use its international facilities.

The Scope of the Challenge

'Life as normal' for TKL was seen in the context of:

- Ensuring business continuity
- Communicating an understanding of the problem to avoid panic or apathy
- Quantifying accurately the level of investment required to address the issue
- Establishing Y2K compliance definition standards (world best-practice standards were adopted under the guidance of ITU (the International Telecommunications Union) and British Telecom plc.

- Ensuring all new systems and processes were Y2K compliant
- Ensuring customers were not affected
- Ensuring revenue generation was not affected
- Maintaining commercial and technical credibility
- Achieving Y2K readiness at minimum cost (in the event the overall programme involved over Kshs.4.3 billion solely funded from TKL's internal resources).

The Regional Challenge

Telecommunications is by nature a cross-border capability and national networks are to an extent similar across the countries of the East African region having been installed during the days of the Community.

The integrated nature of the regional network meant an essential shared approach to meeting the Y2K challenge. This was managed by a working group set up under the auspices of the East African Co-operation. Membership was drawn from industry professionals from the three member states with Kenya taking the leading role in addressing the following key aspects of the challenge, among others:

- integration of test procedures for contingency arrangements
- presentation of spare capacity and contingency connectivity requirements in the respective networks
- presentation and review of reports on cross-border billing
- development of contingency plans to mitigate against external risks

Once again, leadership provided by Kenya's industry professionals was able to extend the national vision of delivering 'life as normal' into a regional context.

Y2K – a Force for Modernisation

As well as its stated objective of delivering services 'as normal' TKL's Y2K programme was charged with expanding and modernising the country's telecommunications infrastructure wherever doing so was feasible.

Y2K readiness for data services and both wireline and wireless telephony, digital switching systems, telex, Kenpac (for packet switching) and Kenstream

(for leased data lines) having been achieved by mid-1999, the focus switched to exploiting improvement opportunities to improve the quality of service to customers.

Some of the projects undertaken included:

- Replacement of the non-compliant international switch with a modern switch increasing the capacity from 1800 to 12000 lines. However the switch could not be commissioned before the roll-over, as the international correspondents were not willing to make new changes in their systems before the date-change. The switch was made ready by rolling the date back to 1980 and the manufacturer installed a software patch to correct the anomaly.
- Installation of a fibre link from Nairobi to the Longonot Earth Station.
- Modernisation of the earth station at Longonot

The Y2K Event

TKL's Command Centre, situated at Extelcoms House, Haile Selassie Avenue, was manned 24 hours a day from 27th December 1999 to 7th January 2000.

In the event, following successful test calls on voice and data services including calls on local, trunk, mobile, international, leased and switched data circuits, and tests performed with counterparts in Uganda, Tanzania, New Zealand, Australia, Japan, United Kingdom, Italy, Germany, France, Cote d'Ivoire, India, Singapore, South Korea, South Africa, Canada and the USA, Kenya's (and the region's) entire telecommunications system rolled-over successfully from 31st December, 1999 to 1st January, 2000 and no Y2K-related problem was experienced whatsoever.

TKL's Y2K Success Factors

Post-implementation review identified the following key success factors on which TKL can build upon:

- Making the business always top priority
- Senior management ownership and backing
- A Y2K process that was efficient, measurable and manageable

- Use of automated tools wherever possible to detect and correct Y2K problems
- Ensuring component end-to-end compliance
- Prompt deployment of conformant components
- A business-as-usual approach
- Collaboration with all levels of stakeholders
- Communication at all times of any glitches and successes

The Final Challenge

The biggest single potential threat to telecommunication operators the world over was customers picking up the telephone just to check whether there was a dial tone. This alone would have created a volume burden causing entire systems to crash.

This was avoided thanks to proper communication with the public and other stakeholders augmented with assurances on Y2K readiness throughout Kenya's telecommunications sector by TKL and the National Y2K Co-ordination Centre.

VIII. PETROLEUM AND PETRO-CHEMICALS SUPPLY CHAINS

The Challenge of 'life as normal'

The importance of petroleum products to the national economy cannot be overstated.

In practice then, 'life as normal' for this sub-sector of the economy meant ensuring that petrol and petro-chemical products were readily available to all consumers – industries, businesses, transport operators, Government agencies and domestic users – at the times and places they required them.

The Cross-Border Challenge

Petroleum's Y2K challenge was by no means confined to Kenya alone. Across large areas of the East African region covering Uganda, Eastern Democratic Republic of Congo, Northern Tanzania, Rwanda and Burundi, people, firms and institutions get their petroleum products through Kenya.

Key Players

The Key Players the sector relied on to deliver continuity were:

- Kenya Petroleum Refineries Limited (KPRL)
- Kenya Pipeline Company Limited (KPC)
- Oil marketing companies
- Ministry of Energy

Kenya Petroleum Refineries Limited

Since 1964 Kenya Petroleum Refineries Limited (KPRL) has been the main supplier of petroleum products in Kenya and the East Africa region. KPRL processes on average 13.2 million barrels of crude oil per year resulting into such finished products as LPG, Super and Regular petrol, jet fuel, kerosene, diesel, fuel oil and bitumen among others. It is an ISO 9002 certified company which understandably places great emphasis on safety and product quality.

To all intents and purposes, KPRL is part of a multi-national operation - Shell International Oil Products BV. Shell International Oil Products BV operates the refineries on behalf of the other co-owners, namely; the Government of Kenya (50%), Shell (17.12%), BP 17.12%) and Caltex (15.76%). As such, market forces and Shell's global best-practice set the context within which business continuity was assured in the face of the Y2K challenge. Given the technological nature of the industry, KPRL's at-risk inventory encompassed:

- Distributed Control Systems (DCS)
- Process Management Computer System
- Financial & Accounting System
- Laboratory Information Management Systems
- Oil Scheduling System and the IT Infrastructure
- Communication Networks

Kenya Pipeline Company Limited

Kenya Pipeline Company (KPC), as Kenya's market leader in the transportation and storage of petroleum products, plays a very strategic role in the oil industry, both within the country and in the East African Region. As a bulk transporter of refined petroleum products, it is the crucial link between the importers and consumers.

In 1998, KPC transported a total of 2.75 billion litres of petroleum products. The total throughput at the end of 1999 was 2.77 billion litres. This represents an increase of 1.5%.

Of the total throughput, approximately 30% is exported to our neighboring countries, Uganda and Southern Sudan, through KPC depots in Kisumu and Eldoret.

Continued service delivery for KPC depended crucially on ensuring Y2K readiness throughout their at-risk inventory encompassing:

- Pipeline Supervisory Control and Data Acquisition (SCADA) System
- Accounting Systems
- Payroll System
- Stand-alone Office Computers
- Office Application Software

- Communications networks

Oil Companies

More than 80% of Kenya's petroleum products market is delivered courtesy of multi-nationals. In order to maintain market share, global best-practices set the context within which business continuity was assured in the face of the Y2K challenge. Work began in earnest in this vital sector in 1997 and industry best-practice set a benchmark for other sector players.

Building of Stocks

Unlike electricity, the absence of which is immediate and glaringly apparent, an absence of petroleum products would take time to filter through the economy. This crucial difference meant contingency arrangements had to reflect the practical requirements on the ground. This meant ensuring adequate supplies were available before the Y2K date-change.

In addition to the country's strategic stocks of petroleum products, the refinery and the pipeline companies in collaboration with other key players - oil companies and the Ministry of Energy ensured that the country had Y2K buffer stocks equivalent to 35 days consumption. The stocks were as near to the point of use as possible.

Events at Roll-over

In line with Shell's global plan, KPRL stopped refining on 31st December 1999 in order to monitor the performance of similar systems in the Far East. After their successful roll-over, refining resumed on Tuesday, 4th January 2000 and has since continued uninterrupted.

KPC halted the pumping of petroleum products for stock taking which is mandatory every end-of-month. After the roll-over, a test-run of the pipeline was performed for a period of two hours. On confirmation of normal operations and successful roll-over, pumping resumed on Monday, 4th January 2000.

Oil marketing Companies reported successful roll-over of their systems and it was business-as-usual in all their outlets.

IX. BANKING AND FINANCIAL SERVICES

Background

Financial systems are vital providers of key services to economies throughout the world. In addition to what has come to be known as High Street banking, these systems provide such esoteric services as mobilising resources, allocating credit, pricing, pooling and trading risks, and monitoring and supervising borrowers' behaviour.

In Kenya, reliance on computer technology and communication systems in delivering these services is almost total. The implication of this was that Y2K presented a whole-industry challenge.

In addition, the interdependence that today characterizes modern economies, meant that no financial institution could hope to achieve readiness on its own. Globalisation of financial markets added a further dimension of complication in the way the industry faced up to the Y2K challenge. If automated applications were to fail or be corrupted, it would be difficult if not impossible to conduct finance business. Hence, the sector was at the forefront of addressing the vulnerabilities early on with significant financial resources and technical expertise.

The Sector and the Economy

By the standards of developing countries - and more so of the Sub-Saharan economies - the financial sector in Kenya, has demonstrated an outstanding dynamism. It manages nearly 60% of the country's annual wealth and in doing so employs more than 17,000 people who between them presently contribute more than 10% of the country's annual income.

Scope of the Y2K Challenge

With the Central Bank of Kenya (CBK) at its apex, regulating and supervising the banking system and managing monetary policy, the industry is a pyramid of financial activity comprising 56 commercial banks, 66 Forex bureaux, 13 non-bank financial institutions and 2 mortgage finance companies. There is also a large non-bank financial institutions segment comprising 4 building societies, 37 insurance companies, 160 insurance brokers, 4 reinsurance firms,

a Post Office Savings Bank, 57 hire-purchase companies, a mandatory public National Social Security Fund and around 1,100 private registered pension and provident fund providers, and some 2,670 Savings and Co-operative Credit Societies.

In addition, there is a Capital Markets Authority, a Stock Exchange, well-developed money and capital markets with all the traditional financial instruments obtainable in international financial centres, a Deposit Protection Fund Board with 17 financial institutions presently under the liquidation process, and 10 or so specialised organisations set up by the government to assist the specific sectors of the economy; these include the Agricultural Finance Corporation, Agricultural Development Corporation, the Industrial and Commercial Development Corporation, Kenya Industrial Estates, and the Industrial Development Bank.

Delivering 'Banking and Financial Services as normal'

The cardinal role of regulatory agencies in the face of the Y2K challenge was to promote the protection of investors, depositors and policyholders and the integrity of the financial markets. This vital role reflected clearly the fact that within a modern economy everyone – individual, firm, and institution – is a stakeholder in the financial system.

In successfully doing this, they contributed greatly to public confidence in the ability of the financial sector to play its pivotal role in economy-wide business continuity during the transition period.

World Best-Practice

All Kenya's Y2K work was carried out according to world best-practices as articulated by the **Joint Year 2000 Council** of the Bank for International Settlement and other international initiatives. Due diligence was the cornerstone.

World best-practice set requirement standards for virtually every aspect of the industry from inter-bank transfers to credit card settlements. As a result of addressing the Y2K challenge the industry underwent a step-change in its level of maturity. The value of accurate and timely information was made abundantly clear as was the need to communicate both to itself and to the wider world.

The Inter-Bank Working Group (IWG) comprising of the Central Bank of Kenya and the Kenya Bankers Association was formed to act as a forum whereby its members could address common Year 2000 issues affecting the banking community, its customers and its shareholders. Its aim was to co-ordinate activity across the industry; one of these was assessing the testing plans of the main infrastructure providers on which banks depend.

Market Forces

Market forces, as in many other sectors, also played a significant role in delivering 'service as normal'. Kenya's financial service providers took every step necessary to ensure they took their customer base with them into the new century. The realisation that, after all, their systems exist to serve their customers was a particular focus which in the normal hurly-burly everyday competitive life is often lost sight of.

The Central Bank of Kenya (CBK)

The functions of the CBK, besides monetary policy formulation and executions, include responsibility for overall financial system stability and the issuing of legal tender. It was therefore paramount for the CBK to take a lead in ensuring year 2000 compliance and in disclosing its own compliance status. The CBK launched its Year 2000 project in December 1997 and was afforded top priority by the Governor and the departmental heads. The CBK's mission critical systems were ready by June 1999. In addition to the appropriate contingency plans, the Crisis and Emergency Response Centres for the headquarters and the three branches were in place by early December 1999. As the sole issuer of currency, the CBK, in conjunction with the Inter-Bank Work Group, took both administrative and technical steps to supplement the significant buffer stocks of currency it usually holds to address any potential for the demand for notes and coins to increase in the lead up to the date-change. CBK reported a glitchless sail into the Year 2000.

Institutions Licensed under the Banking Act

The Banking Act assigns the supervision of commercial banks, non-bank financial institutions, building societies and mortgage finance companies to the CBK. CBK's overall approach to the Y2K supervision of these institutions was based on the view that the prime responsibility for the prudent management of the entities resided with their boards and management. Hence

these institutions committed considerable resources to mitigate the impact of possible Year 2000-related problems arising through internal or external causes. CBK announced stiff penalties including possible suspension from the Clearing House and suspension of license to protect consumers or markets against institutions which were potentially a threat to the market. The threat was never to be as every institution treated the Y2K problem as a business survival issue.

Kenya Post Office Savings Bank (KPOSB)

KPOSB embarked on a radical evaluation and conversion of its systems since April 1997 to arrive at a system void of Y2K bug. Post Bank's mission critical systems – embracing the popular Western Union – used for international money transfers and VISA Card international networks were Y2K ready by July 18, 1999 and independently verified by one of the international auditing firms after comprehensive testing. KPOSB reported no Y2K glitches during the transition period.

Credit Unions

World Council of Credit Unions (WOCCU) initiated the Y2K awareness within the sector during October 1998 by taking several actions to ensure that the century date-change had a minimal impact on the international credit unions' investments through the Kenya Union of Savings and Co-operative Societies (KUSCO). The low level of automation within the Savings and Credit Co-operative Societies (SACCOs) was a blessing in disguise when it came to the millennium bug.

The Capital Markets Authority (CMA) and the Stock Exchange

The CMA gave the Y2K issue the seriousness it deserved by ensuring that all the licensed market operators had compliant systems. CMA instituted a Special Y2K Inspection Team to review the preparedness of their licensees. The participation on the exchange floor was tied to the Y2K readiness. The CMA's systems were ready by November 1999 while the Nairobi Stock Exchange upgraded their mission-critical systems by end of September 1999. The bourse went further to institute an Emergency Response Centre. The Nairobi Stock Exchange and the CMA reported no serious glitches during the date-change.

The Insurance Industry

Like banks, insurance companies were also seriously exposed to the millennium bug. Y2K could potentially have a significant impact on the industry and the interests of policy-holders. Interestingly, as far as the insurance world was concerned, Y2K itself, to the extent that it was known about, was not an insurable risk and hence the introduction of the "Millennium Exclusion Endorsement Claim" by the Association of Kenya Insurers (AKI). Due to the concerted efforts by the Commissioner of Insurance, AKI, and the Association of Insurance Brokers of Kenya, the Industry was on course for achieving Y2K readiness by 30th September 1999.

Provident and Pension Funds

Prior to the enactment of the Retirement Benefits Authority Act of 1997 and the subsequent establishment of the regulatory authority, the retirement benefits sector in Kenya had been operating in an environment that had lacked clear rules governing their management and operations. The major players in the sector are the National Social Security Fund (NSSF), the insurance companies and the trustees. The major consolation in the sector was the early public corporate statement by NSSF pronouncing their full Y2K compliance and the impressive preparedness by the big insurance companies augmented with the low level of automation amongst most of the trustees who in any case had the responsibility for ensuring their computer systems used for their funds management were fully remediated in time to avoid any Year 2000 problems.

National Payment and Settlement Systems

Payment systems are very important to financial stability because they are a potential channel for the transmission of disturbances. Kenya has a highly developed payment system, which offers a variety of payment instruments and circuits to the public, with cheques still being the most commonly used non-cash payment instrument. The systems of major financial institutions that play key roles in the payment and settlement systems were Year 2000 ready by the end of September 1999.

Appropriate arrangements for servicing the commercial banks' needs in case of extra-ordinary demand for bank notes arising from the millennium celebrations and the long holiday were adequately put in place by the Y2K Inter-Bank Working Group.

The Magnetic Ink Character Recognition (-MICR), which is the semi-automated cheque clearing and processing system, was fully compliant by April 29, 1999. Credit Card business' Y2K preparations were tied to the banks' readiness as the banks were the sole acquirers of the large arrangements e.g. VISA, Master Card etc. All the live users of SWIFT in Kenya were compliant on schedule as set by their parent international body while Reuter's product users were fully compliant by December 1998.

Bank and National Millennium Holidays

Prompted by the industry, and in line with best-practice recommendations, the government declared a Bank Holiday on Friday, 31st December 1999 and a National Millennium Holiday on Monday, 3rd January 2000.

This was aimed at allowing firms make an early start in completing year-end processing and system back-ups as part of their wider contingency arrangements. It also allowed additional time to react to any disturbances and rectify any problems encountered in early 2000, while enabling systems and communications to be validated in the actual year 2000 environment.

Event Management and Emergency Response Plan

The final test of Year 2000 readiness was recognised as an organisation's ability to manage events and not the crisis.

The industry, through the Inter-Bank Working Group, followed the NY2KCC **guidelines** for setting up Emergency Control and Response Centres including establishing networks to all strategic financial market operators' command 'hubs'. The aim was to ensure that key policy-makers, as well as members of the public, could receive reliable information during the transition period and to facilitate the quick resolution of any crisis arising from systems failures or disruptions.

The Regional Perspective

In the modern world of finance, national boundaries often count for little and interdependence extends across entire regions.

The common challenge Y2K posed to banking and finance within the countries of the East African Region was managed through a process of

regional co-operation and information sharing which, through its success, set new standards for such exercises. The objective throughout was to make the region a 'safe haven' for investors.

As part of the regional initiative, the Arusha-based East African Commission Secretariat, under the sponsorship of the United Kingdom's Department for International Development (DFID) conducted the first Y2K Finance Sector Seminar for the 3 East African countries' financial market regulators, supervisory authorities, industry associations and respective National Campaign's delegates in Dar-es-Salaam – Tanzania during July 8 – 9, 1999.

The Monetary Affairs Committee comprising the 3 East African Central Bank Governor's Meeting was held in Arusha during April 1999. The Governors resolved to redouble their efforts and co-operate towards achieving Y2K compliance throughout the region to make East Africa a 'safe haven' for doing banking business.

The second Y2K Regional Seminar was held in Kampala during November 15-16, 1999 to review progress made since the Dar-es-Salaam meeting. The major recommendation was the case for instituting National Emergency Response Centres in Kenya, Uganda and Tanzania by latest November 30, 1999. This was successfully accomplished on schedule.

An East African Template, developed by the Regional Co-ordination Team, for setting up and implementing National Emergency Response Centres proved to be an outstanding success and contributed greatly to the world's perception of the region as a *bona fide* 'safe haven'.

Lessons Learnt

Global Networking

It needs to be stated clearly at the outset that Y2K presented Kenya and the whole world with a unique challenge the response to which demanded ways of thinking and working which had previously neither been tried nor even considered possible. Y2K has taught us much about how the world works; the world is both more resilient and more connected than we know.

In industries like banking and finance, information was exchanged and shared around the world in a way never seen before. The smooth transition of

Kenya's banking and financial sector was wholly attributed to the elaborate networking arrangement starting globally with the Joint Year 2000 Council of the European Investment Bank since early 1977; the regional East African Y2K initiative sponsored by the Department for International Development of the United Kingdom; the IY2KCC African Region; and the National Y2K Co-ordination Centre's Financial Sector Unit set up in February 1999 and the commitment of the Kenya Government in this regard.

The central lesson Y2K taught the world (Kenya inclusive) was that relationships are at the heart of any success. Relationships between individuals, organisations and centres, must be strong enough to support the requirements of the challenges they face. Y2K made it clear that the whole world is an interdependent network of demand and supply chains within which the need for healthy relationships is critical.

Way Forward – Future Challenges for the Sector

Challenges for the Financial Market Authorities

The capacity-building challenge remains with the market regulators and supervisory authorities. Most institutions have modernised their IT systems with the latest available versions of everything. For financial system stability the authorities have to immediately avail the right expertise to oversee the smooth operations within the markets especially in the area of E-Commerce, EDP audit systems, institutions supervision techniques, etc.

Contingency Planning

Despite the formality of the remediation processes that had been followed, the Year 2000 challenge involved risks and uncertainties. Nobody could guarantee with confidence that all problems would be avoided. As a result, contingency planning and development was – and still is – important for both institutions and the regulators. It is in this context, that it is desirable that financial market regulators see to it that contingency plans developed within the financial sector during the Y2K project be maintained as business continuity plans.

National Payment and Settlement Arrangements

It has long been understood throughout banking world-wide that payment and settlement arrangements are the very heart-beat of efficient financial systems.

Furthermore, they are the cornerstones of stability. Without them there can be no progress towards the E-business future.

Within Kenya such arrangements must, as a matter of extreme urgency, be brought into line with the guidelines set out by the Basel Committee on payment and settlement systems.

Computer Frauds

As institutions adopt high-powered computerised systems handling large batches of transactions, the exposure to fraud is increased because the ability to understand and operate computers is generally restricted to a few people in the organisation. The major challenge is having comprehensive internal audit controls while at the same time developing the capacity of the organisation's security staff.

On a global basis, capacity-building within the Banking Fraud Department must be a pre-requisite. The growth of Internet Trading makes security and data integrity of primary importance.

Cyber Law

As the twenty-first century progresses, there is a pressing and ever more urgent need for a government lead to be given in this evolving area of legislation. By way of example, there is a huge body of Cyber Law in the United States; both civil and criminal, addressing issues ranging from intellectual property rights and Internet taxation through to anti-pornography measures and encryption systems. These laws not only provide a framework within which electronic exchanges of all kinds can be carried out, they are also part of law curricula throughout the country's universities.

Workable Cyber Law can evolve only when a clear national policy for IT and Communications is available. Producing such a policy must be the first step. On all these counts Kenya risks being left behind if action is not taken urgently but more so the financial sector is the most exposed to this risk because of its high dependency on digital computer and data integrity issues.

The Kenya Government should urgently explore the possibilities of participating in the recently pronounced **\$500m World Bank's Softbank Emerging Markets Support Programme** aimed at providing technological,

legal and management support to internet business entrepreneurs in the developing world which becomes operational in May 2000.

X. TRAVEL AND TOURISM

The Challenge

The challenge presented by this vital sector extends across the economies not only of Kenya but of the entire East African region. It also has a global dimension which underlines its strategic importance. In transport terms it broadly comprises:

- maritime transport – ports, harbours, shipping, etc.
- air travel
- road networks
- railway systems
- associated services industries

Tourism, and by extension hotels and the hospitality industry - one of the country's and the region's top foreign currency earner - is totally dependent upon the transport sector and our environmental national heritage.

Scope of the Challenge

Besides the Ministry of Transport, Information and Communication, under which all the transport issues are co-ordinated, other functions are handled by the respective parastatal bodies or government departments responsible. These include:

- Kenya Ports Authority
- Mombasa Port
- Kenya Airports Authority
- Directorate of Civil Aviation
- Nairobi Airport Services (NAS)
- Kenya Airways
- Immigration Services
- Security Services

The management of these organisations took action to address Y2K to ensure continuity of services and safeguard the interests and safety of the

stakeholders. In addition, considering the importance of Kenya's regional and wider-world role and the inter-dependent nature of services, various international bodies set standards of Y2K readiness and delivery deadlines the country was required to meet. Among the organisations which took great interest in Kenya's transportation sector's Y2K compliance preparations were:

- International Maritime Organisation (IMO)
- International Civil Aviation Organisation (ICAO)
- International Air Transport Authority (IATA)

Technical Dimensions

Of the above bodies, the first two, IMO and ICAO, essentially represent the technical aspects of shipping and air travel. Given the extensive reliance on technology, the stringent guidelines and leading-edge assistance they provided were invaluable in delivering 'life as normal' in these environments.

Aviation (Air Travel) Sector

For air travel as normal, all components ranging from Kenya Meteorology Department (KMD), Directorate of Civil Aviation (DCA), Kenya Airports Authority (KAA), Nairobi Airport Service (NAS), Immigration and Security Services had to be ready. This called for each department to own its program and exercise due diligence. In so doing each organisation had to give special consideration for the interface between its operations and the collaborating bodies.

The Directorate of Civil Aviation (DCA)

The Directorate of Civil Aviation (DCA), like the rest of the aviation industry world-wide, conscious of the key commercial role it plays, had been aware of Y2K's potential for disruption for several years. Against this background DCA's forward-thinking led them to factor Y2K compliance work into the strategic upgrade programme they embarked on in 1998. The final pieces of this wide-ranging programme, which in themselves have no direct bearing on Y2K compliance, were to be put in place by the first quarter of 2000. This would see Kenya ideally-placed to meet growth in demand for air travel projected for the coming decades.

In carrying out Y2K work, DCA adhered to international best-practices and to the stringent requirements and standards laid down by the agencies which

govern the industry world-wide. Thus International Air Transport Authority (IATA) and International Civil Aviation Organisation (ICAO) regulations were met in full in ensuring Kenya's international airports continue to play their strategic role not only domestically but also regionally and internationally.

DCA engineers in collaboration with Thomson CSF of France, who are the main contractors for aviation equipment, were able to attain readiness for their critical systems by August 1998. The message switching system (AFTN) was remedied by 15th of November 1999. Besides this, a new switching system had been ordered and was to be in place during the first quarter of year 2000. This status of readiness was verified by both the IATA and ICAO. Notwithstanding this, and through the Centre's initiative, an independent audit was carried out by Duke Engineering of Arizona, USA, who reported they were confident the 'millennium bug' would not prevent air transport operations 'as normal' come the year 2000.

In developing the contingency plans, DCA took into account the regional requirements. This was due to the fact that Nairobi is a designated Air Travel Centre (ATC). This exercise was closely co-ordinated by ICAO and it saw DCA's staff develop, validate and appraise all stakeholders in the region on contingency plans covering all aspects of air navigation and safety in the region.

Kenya Airports Authority (KAA)

Kenya Airports Authority manages all airports in Kenya. Their 'motto' of managing the best airports in the region was exemplified by their approach to the Y2K Programme. Their team working closely with a consortium of local consultants, Kenya College of Communications Technology (KCCT) and overseas consultants - Y2K Solutions and Pacific2000, executed a thorough program covering all aspects of their business. This included internal business systems such as the elaborate power control and monitoring system, to addressing external risks posed by partners such as water supply, fuel supply, etc.

In remedying their non-compliant systems, KAA extended the tasks to include upgrading and improvement of the facilities and service delivery. This was especially so in the upgrading of the Flight Information Display Systems and

the Power Monitoring System. All of the other systems at KAA were either new and Y2K compliant or automated by use of electro-mechanical components.

KAA being the main provider of facilities, premises and utilities, to all aviation industry's key players, took the lead in providing a fully-equipped Command and Emergency Response Centre at JKIA. This facility saw participants from Kenya Airways, British Airways, Nairobi City Council Water & Sewage Department, DCA, Meteorology, Customs, Immigration, Airport Security Services, Airport Health Services, and NAS come together to plan for the roll-over. This unprecedented co-operation, thanks to the Permanent Secretary's efforts and support for this initiative, created a team spirit and comradeship which contributed immensely to the smooth and uneventful ushering in of the new millennium.

Kenya Meteorology Department (KMD)

Meteorology services are not only essential to the aviation and maritime industry, they are also vital to the agricultural sector which forms a major part of our country's economy. This department, in line with the International Meteorology Organisation, started addressing the Y2K issues early in 1997. A comprehensive prioritised inventory and a Y2K check list were ready by the first quarter of 1999. Nevertheless, due to financial difficulties, the department had to re-evaluate their requirements to focus on the core critical systems which had to be remedied to ensure normal operations continuity. The communication and switching systems were identified as major systems requiring remediation and the department embarked on the process of replacing them. As per the other systems, secure contingency plans were put in place to mitigate against any perceived disruptions. Furthermore, regional mock drills were successfully carried out to ensure that contingency plans were workable.

To manage the roll-over, KMD, like all other players in this sector manned their command centre throughout the critical period and there were no major hitches reported. Currently, KMD is working on upgrading their systems to ensure continued provision of meteorological services in line with set international standards.

Kenya Airways (KQ)

Kenya Airways, the National Carrier and one of the leading airlines in Africa, addressed the Y2K issue by looking into all their systems and equipment both at the Airline's head office and all outstations within their global network. Being the leading airline in the region, and in line with IATA guidelines, KQ co-ordinated the compliance activities in the aviation industry by working closely with KAA, DCA and the Meteorology Department. They collected data and other relevant information from these bodies on behalf of IATA member airlines. This ensured proper communication and co-ordination between all the key players in the sector.

The scope of KQ's work included systems and software for reservations, departure control, flight operations and revenue and financial accounting. KQ also obtained certification for their aircraft suppliers, Airbus and Boeing Co., confirming the entire fleet to be Y2K ready. This coupled with light safety operational aspects brought a sigh of relief to all the users of KQ services and its cargo handling, Kenya Airfreight Handling Ltd.

To complete the smooth delivery of travel services, travel agents and airlines operating in Kenya carried out their remedying process quite timely. This contributed to the glitchless continuation which was observed in the air travel industry.

Y2K and the World of Shipping

Mombasa port has emerged as the leading port in this region over the years. In the process it has handled millions of tonnes of sea borne trade benefiting in the process, not only the East African countries (i.e. Kenya, Uganda, Tanzania), but also Rwanda, Burundi, the eastern part of the Democratic Republic of Congo, and the Southern Sudan. In early 1999, the management of KPA recognised the potential disruption posed by the Y2K threat to their business. They then embarked on addressing the Y2K issues with gusto to ensure the port's ability to continue delivering its key strategic services to its stakeholders.

By the nature of what they do, ports and ships rely absolutely on each other. This means they both have to be Y2K ready simultaneously. For the port this means ensuring the compliance of its cargo handling equipment – ship to shore gantries, reach stackers and so on – as well as its marine craft, its

computer systems, its communications and its general infrastructure. Mombasa Port's Y2K achievement has been extensively and independently audited and verified.

In executing their work, KPA collaborated with the rest of the industry, including adherence to the International Maritime Organisation (IMO) standards and use of best-practices. Against this background, the Port of Mombasa, was among the first of the world's major ports to make a corporate statement that it will be open for business as usual across the date-change. This news, which came as early as August 1999, was excellent indeed since all users were able to plan their activities comfortably.

For the ships, which in lots of ways are the floating equivalent of ports, complete with their own communities, it means they have to attain the IMO's certification of Y2K readiness. Certification covers the entire vessel from navigation systems through engines with safety and support equipment. It also looks at the ship's own off-loading capability to ensure cargo can be discharged whatever is happening, or not happening, on the quayside. The final piece of the IMO jigsaw is the requirement that all ships must carry a Y2K due diligence log. KPA put in place precautionary measures (compulsory pilotage and tug escort) on all ships entering, leaving or moving within the Port particularly on all Y2K critical dates.

Having accomplished all these functions, KPA embarked on setting up a Command and Emergency Response Centre to manage the roll-over and to oversee all operations during this period. This high level of preparedness enabled KPA to not only face Y2K successfully but admittedly they have discovered the potential of approaching projects the 'Y2K style'. It now remains for KPA to extend the same high level of professionalism and effective communication strategies to push the Port of Mombasa to an even higher status.

Railways and Y2K

The Kenya Railways Corporations roots can be traced back to the colonial era when the rail and the port formed a very vital synergy in sustaining trade. Since then, hauling of cargo to and from Mombasa Port and serving destinations in Uganda, Rwanda, Burundi, Southern Sudan and the eastern part of the Democratic Republic of Congo as well as Kenya itself, Kenya

Railways plays a vital role in the economic life of East Africa. On top of this, its passenger services make a big contribution to the tourism industry as well as facilitating the travel on which much commercial and business activities depend.

Railways' critical systems, viz locomotives, rolling stock, signaling systems and train control equipment all operate with no date-dependency. As such they were unaffected by Y2K. Their main exposure to the Y2K threat was in the organisation's computer systems and its Train Tracking System. Readiness for these systems was achieved by July 1999; thanks to an extensive Y2K programme and a large investment in new and upgraded systems which had compliance certification.

The readiness of Kenya Railway Corporation's systems, the readiness at the Port of Mombasa, and the Air Travel systems' readiness status meant that the travel industry was braced for business as "normal" long before the roll-over date. This indeed was the case and the roll-over came and passed without any disruptions in operations; thanks to the co-operation of all the transport sector stakeholders.

Tourism

The International Air Transport Authority (IATA) represents more the user community and as such opened up the scope of the challenge to take in the wider aspects of tourism. This led to the involvement of:

- Kenya Tourist Board
- Kenya Tourist Development Association
- Kenya Wildlife Service
- Travel companies at home and abroad
- The hotel industry
- Ministry of Trade, Industry and Tourism
- Utility providers
- Foreign missions within the country

Tourism is one of Kenya's major foreign exchange earners. The sector is composed of different components ranging from the travel and tour companies, the hotel industry, the Kenya Wildlife Service, the parks and lodges, the Ministry, etc. The industry has evolved from the yester-years of

manual operations to a level where today most hotel chains and the travel & tour companies have a centralised reservations and billing systems. In addition, industry relies heavily on utilities such as power, telecommunications and water services, which are supplied by external entities.

In addressing Y2K, the tourism sector besides remedying its own systems, paid a lot of attention to other activities within its major dependencies. The satisfactory level of preparedness reported by the service providers such as Kenya Power & Lighting Co., Telkom Kenya Ltd., Directorate of Civil Aviation, Water Supply Department, and the verification of the same by the National Y2K Co-ordination Centre, enabled this industry to work on reasonable contingency plans.

The confidence in Y2K readiness and warm welcome always extended to all visitors to our country, led to thousands choosing to celebrate the dawn of the new millennium in our rich environmental heritage.

Awareness and Communication – the Vital Role

Against the background of uncertainty which characterized Y2K, the need for communication was vital if foreign tourists were to be reassured of 'vacations as normal'.

Rumours and scare-stories the world-over made this even more vital. In the event, thanks to the efforts of all involved, the true message reached the target audience. Confidence in its readiness and the warm welcome extended to all visitors to our country, led to thousands to chose to celebrate the dawn of the new millennium in our rich heritage. Kenya Airways - the country's national carrier and voted the best airline in Africa in 1999 delivered a Y2K compliance public corporate statement expressing great confidence that its international and domestic services will continue smoothly during the transition to Year 2000 and beyond and true to its word the services were smooth.

Communications Across the Roll-over

The DCA's Command and Emergency Response Centre, based at JKIA Control Tower maintained two-way communication with the ICAO Command Centre at the United Nations Gigiri Complex and to all the airports in the

country throughout the period of the roll-over. It was also linked to the National Emergency and Response Centre for effective communication.

Thanks to this and similar efforts throughout the industry, the roll-over and the subsequent days passed without any disruptions whatsoever. As a result, the region's first flight of the new century was able to take-off 'as normal' from JKIA a mere 30 minutes into the year 2000.

XI. Y2K AND WATER SUPPLY

Water in Kenya's major towns was delivered 'as normal' despite the immense uncertainty of Y2K.

Water is provided by either the municipalities under the Local Governments themselves or the National Water Conservation and Pipeline Corporation. In both cases, the process of water harnessing and distribution has various components such as the dam or source, treatment systems, pumping, metering, and computer systems for billing and operational use.

The water catchments, processing and distribution aspects of this process are largely electro-mechanical with the distribution relying heavily on gravitational flow and some boosting with pumps which have no date-related control systems.

All the towns (Mombasa, Kisumu, Malindi, Nakuru, Eldoret, Thika, Webuye, etc.) have very versatile water processing plants whose capacity was able to sustain water supply as normal during the roll-over period and beyond.

The country's sewage systems are also largely mechanically operated with no automated control and/or date-related logic. The effluent treatment (where applicable) is also manual with very little automation; further grounds for having confidence that Y2K will not pose an additional problem to water and sewage provision.

The main challenge facing our municipalities' water supply was the efficient management of the excellent facilities which they possess to deliver quality and affordable water and sewage services for which the consumer willingly pays. This challenge remains.

The Y2K way of doing things, which was instrumental in delivering 'water as normal' is the one sure way of delivering this vision into the future.

XII. GOVERNMENT SERVICES

Background

Government is the biggest single employer in Kenya. Its operations play a significant part in almost every aspect of the national life which covers the entire public service of civil servants, teaching force, parastatals and the main security operations of the police, immigration service, prisons and the Department of Defence.

Many families therefore rely on the Government for their work and for their income, whether in salaries, wages, pensions or benefit payments.

In view of its scale of importance, delivering Government Services 'as normal' in the face of the Y2K challenge was critical to the entire national effort.

Y2K Priorities

The Y2K problem and its ripple effects were of such a magnitude that not everything could be fixed at the same time, considering that many organisations including the government, already had constraints finding appropriate and adequate resources due to the high demand and cost.

'Service as normal' within the reality of the Y2K challenge equated to securing the following components to be 'as normal':

- Government revenues
- Payrolls, Budgetary and Financial Management Systems
- National security
- Strategic databases
- Communication systems

Service-Critical Scope

In view of these top-level priorities the scope of the Y2K challenge became addressing mission-criticality within the following strategic departments:

Kenya Revenue Authority

The Kenya Revenue Authority's principal role is the revenue collection for the Kenya Government. Functions facilitating the revenue collection and monitoring process were identified to be heavily dependent on computerised systems.

Necessary structures were set up in October 1998 to facilitate the Y2K remediation process. Areas of Y2K potential threats to delivery of normal services leading to revenue loss and inefficiency of operations were identified.

All the business mission-critical systems at the Customs and Excise Department, the Income Tax Department and the Value Added Tax Department contributing to nearly 100% of the total KRA revenue collection, as well as the Road Transport Department where the revenue collection process is manual and contributes less than 1% towards the total KRA revenue collection, were all established as Y2K ready by the end of the set deadline. In addition, all the supporting systems at the headquarters covering financial management systems and payroll systems had to be made Y2K ready.

Contingency plans, including resorting to the manual process were put in place to ensure continuity of normal operations at all the identified critical business areas.

Reassurance tests to ensure continuity of these systems was successfully carried out during and after the roll-over period and the systems were all established to operate well without any interruptions due to the Y2K date-change.

Government Ministries

The Government adopted a phased approach in implementing Y2K solutions, starting with the mission-critical areas.

Most of the mission-critical systems were identified to be under the Ministry of Finance and these included financial management systems, pension management systems, tax analysis systems, reimbursement systems and the payroll systems.

Addressing the Y2K compliance issue commenced in October 1997 with top down awareness campaigns ranging from top management to the operational levels conducted for all ministries, parastatals and key departments including DoD, Police and Prisons.

As a Y2K remedial measure, PC's, Mainframe and software applications were procured for the mission critical areas. This action took into consideration the enhancement of the payroll system's hardware capacity.

Contingency measures were put in place in good time, which included complete arrangement of backups for all these critical systems and the early processing of January 2000 payroll in case there occurred any malfunctions during the normal processing of the payroll in the month of January 2000.

National Social Security Fund (NSSF)

National Social Security Fund (NSSF) currently has a total of 2.6m members. In 1999 a total of approximately Ksh.1.1billion was received in the form of member contributions and the benefits totalling Ksh.1.75million was paid out to 42,201 members.

On average therefore, the fund received about Kshs.94 million and paid out about Kshs.146 million to 3,516 members per month. These transactions are through the 40 field offices and the headquarters; of which 14 are linked online to head office computers. The rest are served through the nearest computerised branches.

Activities to address the Y2K date-change problem began in the year 1997 with the IT department playing an instrumental role to sensitise the top management on the potential dangers of the Y2K problem on mission-critical business operations.

The Y2K events covered hardware and software procurements, and the application software conversions as well as confirming the business partners' operations.

All the mission-critical business systems and support systems were made fully Y2K ready to ensure business operations were not interrupted across the date-change.

Sufficient contingency preparedness was put in place. This included backups and print-outs of members and employer files both in the compliant and non-compliant modes and manual methods and procedures of the business operations developed. These arrangements were ready for deployment in all critical business operations in case systems' malfunctions could occur during the transition/roll-over period to year 2000.

Department of Defence

The Y2K remedial work plan was drawn up with key milestones clearly outlined and priority given to communication systems.

Inventory was conducted on all military equipment within the military establishment. Most of the hardware was established as Y2K compliant. However, some PCs and communication systems were established not to be Y2K compliant.

While putting in place all the plans to fully implement the Y2K solutions identified to be dependent on funds availability from the Government, DoD was however advised to develop and rely on contingency measures to ensure continuity of operations. This strategy worked successfully during the transition period.

Police Department

The Police play an important role in ensuring the internal security of the country.

Addressing the Y2K problem within the Police Department started in early 1998 and Communication systems were identified as a high priority area. By April 1999, Radio communication systems, control systems, data message switch, the PABXs and the interpol X-400 communication network were all established as Y2K ready.

Contingency measures including the manual date-stamping on all electrically transmitted messages in case of failure on computer systems were put in place in good time to ensure smooth operations as a result of the date-change. No

extra cost was incurred since most of the communication systems met the Y2K compliance requirements.

Prisons Department

Addressing the Y2K problem coincided with the Prisons Department programme on the procurement of new communication equipment. Thus, critical areas covering radio telephone exchange, radio telephone switches and digital radio networks were all established as Y2K ready and also successfully rolled-over without any disruption on normal operations.

Office of the President

Immigration and the National Registration Bureau were identified as departments that provide very vital public services on a daily basis.

Immigration Department and Y2K

This department is a security arm of the Government and has the responsibility of revenue collection through issuing of passports.

Y2K compliant hardware was procured and stationed at all the passport-issuing points with three points at Nairobi and one each at Mombasa and Kisumu to ensure continuity of operations of the Passport Issuing Management Systems across the date-change.

National Registration Bureau and Y2K

The National Registration Bureau plays the roles of issuing National Identity Cards to Kenyan citizens who are 18 years and above for identification purposes in order to facilitate maintenance of security.

The Bureau currently maintains records in the computer systems of at least 13m Kenyans already issued with National Identity Cards and is presently issuing National Identity Cards at a rate of at least 2000 newly registered persons per day.

The department also issues the Civil Servant's Identity Card and is presently manually processed with the manual data archived in stand-alone computers.

Identity cards are of strategic importance and a requisite for the issuance of other government documents such as PIN cards, passports, driving licences

and in most cases a mandatory requirement for critical financial business transactions such as in banks.

The National Identity Card Issuing System is computer dependent and was established to be under a contract management between the Kenya Government and a French consulting firm, namely IDMATICS. This contract extends beyond the Year 2001. This mission-critical system was confirmed Y2K ready and a certification of Y2K compliance issued by the contractor and no extra cost attributed to Y2K requirement was incurred.

Contingency measures were put in place to cover backup of all critical systems and stored data in order to both maintain data integrity and ensure continuity of operations after the roll-over.

Research Institutions

Considering the sophisticated nature of the equipment used for research work, Y2K remediation measures was given very high priority at the main research institutions covering; Kenya Medical Research Institute (KEMRI), Kenya Forestry Research Institute (KEFRI), Kenya Industrial Research Development Institute (KIRDI), Kenya Marine and Fisheries Research Institute (KEMFRI), Kenya Agricultural Research Institute (KARI), and Kenya Trypanosomiasis Research Institute (KETRI).

Most of these institutions implemented the Y2K solutions through procurement of compliant equipment.

Kenya National Examination Council

The critical systems, both IT and communications were destroyed by the bomb blast that occurred in Kenya on 7th August 1998.

The British Government through DFID donated compliant equipment to replace the entire destroyed equipment.

Contingency measures were put in place which included disaster recovery procedure as:

- Mirroring KNEC systems with the system at the University of Nairobi
- Backup of KNEC data in tapes on a daily basis

- Marking of major exams like KCPE using computer systems to be completed by 24th December 1999.
- No examination processing was planned to take place during the critical transition period between 24th December 1999 and 3rd January 2000.

Provincial/District Headquarters

All the mission-critical systems at the provincial headquarters covering communications, financial management systems and vital statistical data were all adequately addressed and established as Y2K ready.

Delivering 'service as normal'

Following the Y2K Roadmap set out by NY2KCC, Government Services were able to survive the high uncertainty around the date-change period. Huge efforts went into this challenging and wide-ranging work.

Roll-over Event Management

In common with the rest of the economy, a Government Services Crisis Management and Emergency Response Centre was set up according to NY2KCC guidelines. In the event, again in common with the majority of the economy, the transition was smooth, reflecting the effort that had gone into ensuring it.

Observation and Recommendation

Top management's low literacy level on the role of IT in business operations caused Y2K to be initially viewed as exclusively an IT (Information Technology) problem rather than a business problem. This resulted in considerable delays in addressing the actual Y2K challenge with Government Services.

Future delivery of service will depend more and more on computer systems, IT and telecommunications. There is therefore a clear need for the following:

- an IT and communication strategy must be produced and communicated through the public service
- appropriate training must be made available in order to build capacity to deliver service and extend the service offerings as required into the future

- at present, service relies very heavily on hired consultancy services to manage IT projects. This capability must be brought in-house if people are to have meaningful and satisfying careers in the public service
- there is need to standardise and rationalise the procurement procedures in order to reduce heavy financial losses through the procurement of IT equipment not meeting standards and at inflated prices
- there is a need to restructure the government computer systems services so as to establish regional heads such as provincial computer service heads in order to enhance efficiency in managing IT service delivery
- clear expectations must be in place as regards service level agreements (SLAs) throughout Government Services

XIII. HEALTHCARE, SAFETY AND ENVIRONMENT

Background

The sole objective of Y2K efforts within this sector was to ensure there was minimum degradation in the delivery of patient health-care as a result of Y2K

The Context

The public health sector in Kenya is organised on a national, provincial and district basis. The Ministry of Health oversees the provision of healthcare through a network of hospitals and dispensaries. Funding for patient care is managed through the National Hospital Insurance Fund. Each Province has a Provincial Medical Officer (PMO) and a comparatively well-equipped Provincial General Hospital. District Medical Officers of Health carry responsibility at a District level. The District General Hospitals have less technology than their provincial counterparts.

The Y2K challenge was an additional issue for the health sector to contend with against a backdrop of increasing pressures due to HIV/AIDS, malaria and other communicable diseases e.g. tuberculosis (TB), typhoid, etc. The degree of readiness achieved in the public health sector stands as a testament to the Y2K teams in public hospitals and the Ministry of Health. Private hospitals dealt with the problem in a world-class fashion and actively assisted the public sector wherever they could.

At a national level, the Ministry of Health took overall responsibility for coordinating the Y2K action programme, both in respect of gathering information and distributing advice. It also provided a focus for national-level discussions with suppliers and donors where this was necessary.

The Safety and Environment sub-sectors proved much more difficult to identify. They have almost no specific organisations providing services. The main publicly expressed concern regarding Y2K and safety that was not explicitly covered in any other sector was lifts. The main concern with the environment was that environmental factors would not be as highly regarded in contingency planning as in normal business functioning.

Delivering Public Healthcare "as normal"

From the outset, Public Health was perceived as being the area most at risk from unresolved Y2K issues. In addition, its role in delivering 'life as normal' to residents and citizens, gave it high-level criticality.

In December 1998, as a first step, the Ministry of Health formed a task force; one of the first Ministries to do so. The objectives of this task force were:

- to ensure that key processes surrounding the provision of effective treatment and care for patients continued to work
- to ensure that the key management and healthcare processes which ensure the smooth running of the public health sector suffered minimum disruption
- to ensure that the Ministry of Health was protected against litigation
- to develop plans and activities in the context of the Government Year 2000 Plan prepared by the Ministry of Finance
- to explore opportunities for donor funding

Scope of the Public Healthcare Challenge

The organisations directly covered by the Ministry's Programme were:

- Ministry of Health Headquarters
- Ministry of Health Provincial and District Headquarters
- Hospitals, clinics, dispensaries, pharmacies and other healthcare providers directly managed by the Ministry of Health
- Health Training Colleges that are the responsibility of the Ministry of Health
- National Hospital Insurance Fund.

The Private Healthcare Sub-sector

Private hospitals are in many cases parallels of multinational businesses and as such virtually all of them had excellent Y2K projects in place. Planning gaps were identified by using questionnaires, and all necessary actions were then rapidly taken to address them.

Sector information needs, mainly concerning external dependencies were identified as a result of this work. From June 1998, monthly Utilities Bulletins were issued describing the progress being made in the areas most concerning them, namely electricity, telecommunications, water, sewage, finance and

insurance. Newsletters and Contingency Planning Guidance were also circulated to the private health sub-sector.

The Rescue Sub-sector

Questionnaires were also used to align Y2K efforts among the main rescue organisations. Assessment subsequently showed that all organisations had taken appropriate measures. This assessment was fully confirmed by the Y2K event itself.

The Safety Sub-sector

It has already been stated that the main publicly expressed concern regarding Y2K and safety was lifts. All lift manufacturing and servicing companies were contacted and provided with the most up-to-date information available. The lift companies assessed the problem and made the National Y2K Co-ordination Centre (NY2KCC) aware of all the lifts which were electro-mechanical and not electronic in operation. Electro-mechanical lifts were not susceptible to Y2K.

The main security organisations were sent questionnaires to assist in identifying areas needing further work. Assessment and events subsequently showed that all organisations had taken appropriate measures.

Perspective and Forecast at Date-Change

Continuity and contingency plans continued to be fine-tuned right through to December 1999 to make sure that healthcare services and medicines would be available on an 'as normal' basis.

As a result, major private hospitals, rescue organisations and the NHIF were Y2K ready by the end of December 1999. In public hospitals some non-compliant medical equipment was either taken out of service or used with limited functionality due to lack of time and money to replace or upgrade.

The nature of the problem made likely a small reduction in the quality of care received but the likelihood of patients coming to harm was negligible. The majority of NGOs working in the health sector were also adequately prepared. However, it appeared likely that a minority would suffer some computer

related problems. In the event, thanks to the depth of the preparation work, such instances were few and isolated.

Seminars, Workshops and Courses

With the support of the UK's Department for International Development (DFID), awareness sessions were delivered throughout February, March and April 1999 in all provinces with the exception, for security reasons, of North Eastern Province. Feedback from these courses proved that they had been received well and helped to identify future assistance.

A major risk management and contingency planning workshop was held for healthcare organisations in Nairobi on 6th June 1999. 60 healthcare professionals attended. Following on from this, successful contingency planning workshops in support of the prepared guidelines were delivered in Embu, Nyeri, Nakuru, Kakamega, Kisumu and Mombasa.

Donor Assistance

The Ministry, realising the impact that non-compliant equipment could have on health facilities, was keen to facilitate, in any way possible, the renovation or replacement of such equipment. The Ministry wrote to donors involved in supporting the Kenyan health sector to seek meetings to explore assistance. Providing consultancy and tape streamers for backing up all computers had already involved DFID and offered to assist with upgrading medical equipment. GTZ, responded with the offer of replacement computers.

Command and Emergency Response Centres

Hospitals, by the nature of their activities, work 24 hours a day, 365 days a year. This adds to the uniqueness of the sector. All major hospitals had a Y2K team or person on duty over the millennium date-change. Their role was to oversee the resolution of any Y2K issues and supervise contingency measures.

These groups formed the hubs of a national network to relay problems and solutions across the health sector. This plan required the contribution of the private and public health sectors. Because of the unique culture within healthcare institutions to put the care of patients first, at no stage was this an obstacle. Relaying Y2K messages across the health sector was primarily to inform of potential and actual problems and inform of workarounds and

solutions. By means of such co-operation and information sharing, the delivery of patient healthcare was maintained across this period of great uncertainty

Lessons Learnt Peculiar to the Sector

Following post-Y2K assessment of the sector, many organisations commented on the success of the awareness programme. The use of face-to-face briefings, newsletters and emails contributed greatly to the success of the sectoral programme.

Another contributory factor was the public-private sector co-operation. It is now apparent the two can work together and share information where this is shown to be for the common good.

Issues that impacted negatively on the programme were communication and continuity. Communication using telephones, faxes and emails proved to be difficult in some provinces. This resulted in difficulties arranging visits, meetings and workshops and a significant amount of time spent on travelling.

It is vital for national projects of this nature to have proper communication facilities across the board. Continuity proved a problem as a large number of senior staff changed early in the project's life. To a large extent, these problems were overcome, however, they inevitably caused delays and probably reduced the efficiency of the programme. In such volatile circumstances, the lesson is to intimately involve several senior managers to ensure continuity.

Way Forward: Future Challenges within the Sector

It is possible for better health outcomes for Kenya's poor to grow out of the country's Y2K programme. As a vehicle for delivering these benefits, an entirely similar methodology to that used in meeting Kenya's Y2K challenge could be utilised.

Taking advantage of the opportunities now available requires everyone involved to move quickly before momentum is lost, relationships decay and opportunities pass.

Any such initiative would need to be based at the Ministry of Health. Work would need to be in line with Kenya's National Health Sector Strategic Plan and form a much-needed bridge between public and private sectors. Improving the quality of care available to Kenyans within existing resource constraints is the critical challenge that such an initiative could begin to address.

Issues that need to be urgently addressed include:

- The timeliness, quality and availability of information.
- The alignment of donor-funded vertical projects to the overall health sector without imposing undue restrictions.
- The retrieval of public health-orientated information from the private health sector.

Policy Recommendations

The health sector in Kenya could benefit from strategic realignment. It has been shown that making use of the ability to innovate, the ability to be responsive to change and the ability to streamline, depend on the degree of alignment of business, information and human resource strategy.

It follows then, that the public health sector, through the Ministry of Health, needs to look at its information strategy and the alignment of this and its human resource strategy to its National Health Sector Strategic Plan.

On a more operational level, it is recommended that the Ministry maintains its inventories of computers, software and medical equipment. These will prove valuable in future maintenance and replacement programmes. It is also recommended that the Ministry develop a policy of data backups, utilising the tape streamers purchased during the Y2K programme.

XIV. THE FIELD OF COMMERCE

Manufacturing

Introduction

Manufacturing in Kenya employs around 217,000 people and has an annual wage-bill close to 300 billion shillings. The sector contributed approximately 13% of the country's 1998 GDP.

For manufacturers, the key Y2K challenge was securing business continuity at a time of mounting uncertainty. In terms of the national vision this meant delivering 'manufacturing as normal' thereby avoiding any disruption in the everyday lives of Kenyans.

In the event, thanks to extensive planning, testing and the commitment and investment of business leaders, the supply of goods and services from the sector to the national economy continued without interruption across the period of the date-change.

Interdependence within the Sector

In common with all developed economies, there was extensive use of at-risk machinery, equipment, computer systems, communications networks and automated processes within Kenya's manufacturing sector. This inventory set the initial scope of the challenge.

In addition, the sector has a high degree of interdependence. In simple terms it comprises larger manufacturing operations, including many multinationals, and the small and medium enterprises (SMEs) which largely exist to service their needs.

The larger concerns account for about 20% of the total number of firms and contribute approximately 80% to the manufacturing GDP. SMEs make up about 80% of the numbers and contribute 20% of the sector's GDP.

In general, multinationals addressed the Y2K challenge according to the global standards and best-practices demanded by their parent organisations.

As a result, the SME sub-sector Y2K initiative was essentially driven by the larger firms addressing their external supply-chain risks. To some extent, contingency plans of the multinationals revolved around SME activities. This is an indication of the scale of interdependence and synergy Y2K generated throughout the economy. The economies of scale which resulted are still in place and generating benefits.

Scope of the Sector

Packaging

The Packaging Industry was a top-priority focus, primarily because every manufactured product requires packaging. Whether involving paper, metal, glass, plastic, wood or cardboard, the industry figured prominently throughout the manufacturing supply-chain. Contingency arrangements were shared throughout the sector as much as commercial considerations would allow.

Food and Beverage

Food and beverage is a very diverse industry. It not only covers major export products such as Tea, Coffee and Sugar, it comprises extensive milling operations and its scope extends to alcoholic drinks, soft drinks, cooking products and food processing. Markets are such that some of the world's largest firms operate in this industry. As a result there was a sufficiently large number of high-profile stakeholders setting Y2K standards which in turn set expectations across the industry. As a result of these, international communication channels opened up which were of benefit to the whole economy.

Construction Material

The main construction materials comprise cement, roofing materials (including iron sheeting, tiles and timber), paints, bricks and steel products. The use of technology in all facets was lowest in this industry and there were few multinationals. This, however did not make meeting the Y2K challenge any easier than elsewhere. It meant the nature of the challenge was somewhat different. Lessons learnt in running wide-scale projects involving change will stand the industry and the economy in good stead in the future.

Pharmaceuticals and Chemicals

As a sub-sector, pharmaceuticals have perhaps the highest population of multinationals in the economy. It is also highly automated. The nature of

mission-criticality is well understood within this context. The result was that the complexities of the Y2K challenge were handled using clearly defined methodologies which ensured service continuity.

The same observations apply, though to a lesser extent, to the chemicals sub-sector. Extensive preparation and constant monitoring ensured a smooth millennium transition.

Sanitary

This industry, comprising as it does, soaps, detergents, sanitary towels, toilet paper and associated cleansing materials, also has its fair share of big players. As a result market forces largely drove the activities in this highly-competitive environment. This was always a healthy sign of true engagement with the challenge. As expected, market leaders set the pace for everyone else.

Electrical and white goods manufacturing

Y2K within this industry, least mechanised in its production processes and with IT systems mainly used in the accounting area, proved a fairly straightforward challenge. With good planning and up-to-date project management standards the challenge was satisfactorily met.

Transportation

Included in this industry were motor vehicle assembly, spare parts and tyre manufacturers. Again, the competitive environment proved to be the driving force in meeting the challenge. Within the tyre sub-sector, the market leaders, part of a US global giant, once again set a level of expectation and performance from which everyone was able to benefit.

Textiles

This industry is overwhelmed by seemingly insurmountable problems and to all intents and purposes is actually in a state of collapse. That said, production such as it was survived the date-change and Y2K problems brought to light within the industry's IT systems, mainly stand-alone PCs, were satisfactorily addressed.

Small and Medium Enterprises

As already indicated, SMEs play an integral role in Kenya's economy. SMEs comprise all registered and non-registered businesses employing fewer than

100 staff, and having a turnover of less than Kshs.500,000,000 per year. Within this category are around 300,000 organisations, each with an average of 10 employees. On average these 3 million people each have five dependents, indicating that SMEs support around 15 million people.

Developing a single Y2K response within such a large and disparate sub-sector was clearly impossible. In the event, continuity was again delivered by market forces. The NY2KCC focus was continually on awareness raising. The Centre's booklet – “**SME Guide-Lines**” proved invaluable in securing ‘life as normal’ in this vital part of the economy. The booklet is contained in the **appendices** to this report.

Date-change Event Management

The competitive environment and the need to respond rapidly to market forces are characteristic of manufacturing industries throughout the world. As a result there was practically no unified preparation for the date-change in the sector. The National Y2K Co-ordination Centre's (NY2KCC) Emergency Preparedness Guide was distributed to major players throughout the sector to assist in preparation for the date-change.

Many firms, most notably those in consumer product manufacturing operated ‘Emergency Response Centres’ for the first few days of January Year 2000 allowing a true picture of the Y2K impact to emerge with minimum risk.

Lessons Learnt Peculiar to the Sector

As a result of competition and the perceived need to protect market share, information sharing is practically non-existent within the sector. This was seen to be so as a general observation, Y2K aside. There is now a realisation that it is possible for common risks to be commonly managed for the benefit of all. In addition, it is also understood that this in itself will enable innovative players to enhance their competitiveness.

Traditional business practices which were considered to be indispensable are now seen in a more balanced light as a result of the knowledge acquired handling the Y2K challenge.

Way forward: Future Challenges within the Sector

The various economic problems affecting the sector could be tackled with relative ease using the common experiences gained from Y2K.

There is need for stakeholders to form efficient information sharing systems, with a view to achieving a unified approach for handling common problems and managing common risks in the sector.

Sharing of information was identified as a major problem in the sector. Addressing this could be the single factor that is capable of triggering massive change.

Policy Recommendations

The Association of Manufacturers and several kindred organisations within the sector need to be more cohesive and to provide more proactive leadership than is the case today. This is likely to achieve more tangible results when dealing with problems within the sector.

Agriculture

Introduction

Agriculture is the mainstay of Kenya's economy providing livelihood for approximately 75% of the population. It currently contributes some 24.6% of GDP and accounts for 60% of the total foreign earnings. It also provides direct employment for over 274,000 people.

There are strong forward and backward linkages with manufacturing, commerce, transport and finance. As well as stressing the importance of agriculture, this once again highlights the level of interdependence within the economy.

Main activities are crop production, horticulture, dairy and livestock farming.

The agricultural export base is largely dependent on tea, coffee and horticultural products. Other cash crops such as sugar, sisal and pyrethrum, together with the fast-growing horticultural sub-sector, with products ranging

from cut flowers to asparagus, also contribute significantly to Kenya's foreign exchange earnings.

Ensuring Continuity

In common with much of the rest of the economy, market forces, commercial pressures and the need to achieve contracted performance targets played a fundamental part in the sector's successful response to the Y2K challenge.

Dominant players across the sector, many of them multinationals, together with the guidance of national marketing boards, national product boards and the Kenya Bureau of Standards, set Y2K expectations both internally for their own operations and externally, forward and backward into the demand and supply chains. These proved invaluable in successfully delivering continuity.

This leadership extended into the commerce sub-sector where the effects of market forces are felt most rapidly and where the need to respond is thus more pressing. Once again the response enjoyed total success.

XV. REGIONAL CO-OPERATION

Background

The countries of East Africa include Tanzania, Kenya and Uganda. These three nations have shared elements of infrastructure and long histories of co-operation and mutual support. Uganda, for instance, relies upon Kenya and Tanzania for its petro-chemical products. Parts of Tanzania and Kenya rely upon Owen Falls Dam - Uganda for electricity. Kenya's Jomo Kenyatta International Airport is the regional hub for all international air traffic, and the two main ports of Dar-es-Salaam and Mombasa are East Africa's windows onto the maritime world.

During 1998, all the countries established a National Y2K Campaign under a Co-ordination Office with Task Force Authority and budgets. Each national campaign had the responsibility for ensuring that its country was prepared for Y2K come the date-change. The Governments of Kenya, Uganda and Tanzania had followed the emerging internationally-derived best-practices for the management of their national campaigns and established Steering Committees with both public and private sector representatives to monitor progress.

East Africa – A Safe Haven

The National Y2K Campaigns identified the respective critical sectors of their nation's normal operations and established the goal of ensuring that these critical sectors would work effectively in the new millennium. The sectors addressed the basics of life in a modern, civilised society: food, water and power. They also covered the modern mechanisms of managing a complex society such as communications, finance and transport and also included those areas which are necessary for maintaining a civilised way of life: health, security, good government and an on-going commercial sector.

At a meeting held back in February 1999 in Arusha, Tanzania, the Heads of the National Campaigns established a common vision of "**East Africa as a Safe Haven**". They defined it as follows:

“People have a right to expect that everything possible is done to minimise disruption to their well-being and everyday lives, arising from the Year 2000 date-change within the East African Region”.

For the three National Campaigns, this translated into a plan of action to ensure that, come the D-day in East Africa at least, it would be “Business-as-Usual”.

The Role of the EAC

Since the demise of the old East African Community, the need for a body to address the regional issues had not diminished, and the Secretariat to the Commission for East African Co-operation, under the guidance of the Executive Secretary, Ambassador Francis K. Muthaura, has neatly filled the slot over the last many years. The issue of Y2K was clearly one that had regional implications, particularly in the four “cross-border” sectors of Transport, Communications, Finance and Energy. The EAC was quick to respond to the call for action. A regional programme was established in April 1999, funded by the UK government under the EAC Secretariat, with a remit to address the regional Y2K problems of East Africa. This programme was a great success as we all know that there were no serious disruptions in the region during the roll-over period.

National Y2K Campaigns

The following bodies made up the national campaigns in each country of East Africa:

Kenya:

- National Year 2000 Steering Committee under the Chairmanship of the Permanent Secretary to the Treasury.
- National Year 2000 Co-ordination Centre
Director: Mr Michael Karanja

Tanzania:

- National Year 2000 Steering Committee under the Chairmanship of the Deputy Minister of Finance.
- National Year 2000 Central Co-ordination Officer
Director : Engineer August B. Kowero

Uganda:

- National Year 2000 Steering Committee under the Chairmanship of the Permanent Secretary/Secretary to the Treasury.
- National Year 2000 Task Force Manager : Mr Elisha Wasukira

Responsibilities

As part of their responsibilities to their respective nations, the three National Campaigns provided regular monthly reports concerning the state of preparedness in ten key sectors of the national infrastructure and economies. These key sectors fell into the following broad categories: Central and Local Governments, Commercial Sector, Defence, Health, Telecommunications, Banking and Finance, Transport, Agriculture and Food, Water and Sewerage and Energy.

Some of these sectors had cross-border linkages and hence had increased Y2K exposure within the region.

Regional Strategy

In order to tackle the cross-border level of exposure effectively, the **East Africa Y2K Regional Co-ordination Project** was initiated. It was formally in existence by April 1999. The project's objective was to share knowledge, skills and resources within the East African Region. Since its inception the project carried out a programme of co-ordinating Y2K activities in the four key sectors and achieved considerable success in agreeing, carrying out and verifying Y2K activities in each country. The four sectors were:

Banking and Finance: covering Central and Commercial banks, insurance, non-bank financial institutions, Credit Unions, Pension Schemes, Capital Markets

Communications: Covering Telecommunications, broadcasting, press and data network.

Energy: Covering electricity and petro-chemicals

Transport: Covering mainly civil aviation, railways, marine and shipping

The Project undertook many events under the auspices of the Secretariat to the Commission for East African Co-operation (EAC). All reports from the meetings and workshops carried out are available on request from the Secretariat to the Commission for E.A. Co-operation (EAC) offices in Arusha, Tanzania.

Managing the Transition within the Region

The Regional Year 2000 Emergency Response Plan – E.A. Template was prepared and issued during September 1999 by the Y2K East African Regional Co-ordination through the Secretariat to the Commission for East African Co-operation.

As part of the overall Y2K initiative of the region, the 4th Heads of Y2K Campaign Meeting was held on 17th November 1999 in Kampala under the initiative of the Y2K East African Regional Co-ordination Project, sponsored by the UK's Department for International Development - East Africa (DFID-EA). The dominant agenda during the meeting was to refine the modalities for managing the transition. It was agreed that the three countries adopt the East African Emergency Plan Template. Suggested best-practice methodologies of communication networks were also adopted.

The adopted communication strategy for roll-over included the three National Campaign holding concurrently, a press conference at mid-day, Thursday 30th December 1999. Three local bulletins were scheduled starting from 09.00hrs Friday 31st December 1999 to 21.00hrs Wednesday 5th January 2000. These were issued by each country for subsequent collation and rebroadcast by the EAC. The EAC hired space in regional newspapers from that date until one week after the roll-over. The three East Africa countries had also to declare bank holidays for December 31, 1999 and Monday 3, January 2000 within the region.

Everything went per plan and hence the smooth dawning of the new century.

XVI. LESSONS LEARNT AND ROADMAP TO THE FUTURE

Kenya Y2K Programme was Guided by a Vision of Delivering Life as Normal

In order that Kenya is able to build on the success of its Y2K investment, every piece of work – every project, every aid initiative, every investment, every strategic change of any kind – could be aimed at achieving three objectives individually, organisationally and nationally in whatever specific context they take place:

- long-term excellent performance against Kenya's own and international standards
- self-correction – the ability to know when things are going wrong and to correct them
- self-generation – the ability to find resources and build relationships to continue to develop capability and to stay ahead

Lessons learnt in the course of managing Y2K in the Country can give a direction on how to deliver this guiding vision.

Generic Lessons Learnt

The central lesson Y2K taught the world was that relationships are at the heart of success. Relationships between individuals, organisations and countries, must be strong enough to support the requirements of the challenges they face. This resulted in many individual and collective Y2K lessons being learnt which can best be summed up under the heading:

- how to use relationships - in particular between the private and public sectors - to successfully manage large and complex challenges of common interest.

a number of key aspects of this central lesson are worth exploring:

- how to ask difficult questions and respond to the answers

- the need for and the nature of due diligence
- an understanding and importance of prioritisation
- the nature and ability to work to deadlines.
- what ownership of risk means and implies
- the need for healthy, honest and open relationships – interdependency, communication and information sharing
- the role of technology and data integrity in economic and social life
- ingredients of success

Some of these aspects are separately addressed below in the context of delivering the guiding principle although they are all inter-dependent and as such are all part of each other.

How to use relationships – in particular between the private and public sectors - to manage large and complex challenges

One of the ways in which cultures limit their effectiveness is by making everything the same sort of problem. Engineers, for example, often assume that engineering analysis will lead to the right information so that the right decisions will be made. (For engineers, read also governments, aid providers, civil servants, poverty lobbyists, politicians, the media, secular leaders, religious leaders, health workers, in fact practically every cultural sub-set in existence). This observation goes some way to explaining the different values prevailing within the public and private sectors of Kenya's economy. Experience shows that bad decisions are often made for structural reasons even when good or better information is available elsewhere. Cultural limitations mean that people at all levels are often poorly placed to be able to take actions that need to be taken.

Y2K, by bringing the differing values of the public and private sectors together in a unique manner, provided a perspective in which these limitations were challenged. As a result, through relationship building, individuals and organisations within both sectors were able to become more effective.

Y2K relationships also provided a context for re-negotiating some basic cultural assumptions about responsibility. This was vital where a number of different organisations with different cultures and values were involved.

Traditionally in such circumstances, particularly when ambitious, large-scale, complex or public-private sector initiatives are at stake, the biggest risks end up being 'nobody's business' and as a result go unmanaged.

There are huge barriers within relationships which prevent negotiations taking place about what might have to be done if events don't turn out as planned. When this happens huge energy gets drained away in blame avoidance. Y2K, by putting the spotlight firmly on the complex interdependent relationships which make up a modern society, was able to begin the process by which these cultural barriers can be broken down. The result was that key risks were made public and management of them was shared.

When risks are managed in the way Y2K relationships allowed, it means individuals and organisations are able to exploit opportunities wherever and whenever they arise. In the context of today's world, windows of opportunity are becoming increasingly brief. This means, they must be responded to rapidly and effectively. Thanks to Y2K, the capability to do this is now available to Kenya.

How to Ask Difficult Questions and Respond to the Answers

Risk Management, which is the successful heart of Y2K lessons, requires difficult questions to be asked and potentially threatening issues to be raised. Very often with people and institutions which would rather they weren't in fact being raised. This was indeed the case in the early stages of Y2K. As the global project developed however, many unpleasant questions and issues came out into the public domain and addressing them became less of a threat to those in areas of responsibility.

Stated simply, the 'difficult questions' lessons for Kenya from this are:

- if you don't want to know, don't ask. For individuals and organisations at all levels this means do something about your approach to change only if you are prepared to deal with the issues that are brought up, otherwise the exercise is simply destructive.
- make sure all the problems which need to be solved are appropriately owned. For individuals and organisations at all levels this means if you need to know the answers then look at the degree to which you can own the problem and solution on behalf of the vision. The more clearly the

problem can be owned and framed the better the chance of turning problem into opportunity.

- difficult questions are made more difficult when they are unexpected. For individuals and organisations at all levels this means the necessity and imperativity of asking difficult questions is made explicit. Setting and managing 'no surprises' expectations in this way is a key Y2K relationship lesson.

The Need for and the Nature of Due Diligence

The main aspects of this particular lesson relate to trust, responsibility, accountability and the need for openness. As such they are worthy topics in themselves of significant and substantial further investigation in relationship building.

Due diligence was a cornerstone of world best-practice in meeting the Y2K challenge. As a concept it can be seen to stem from the legal notion that those in positions of power and authority owe a duty of care to those on whose behalf they exercise their office. The nature of individuals' and organisations' relationships with power is a crucial lesson whose potential and significance within the Kenyan context was fully brought home by Y2K.

By extension, due diligence reinforced familiar lessons regarding the vital nature of leadership, vision and the exercise of power when the stakes are high. Y2K leadership in Kenya, which came crucially from the Chairmen of the Steering Committee (the Chairmanship was held by the person at the time who was Permanent Secretary – Ministry of Finance and there were two during the Life of the Committee who were fully committed to the vision), the Steering Committee Members and the National Y2K Co-ordination Centre Director, set excellent standards of due diligence.

An Understanding of Prioritisation and the Nature of Deadlines

This is a lesson concerning the economics of success. In other words it is about the timely allocation of scarce resources, for which there are many competing demands, to the precise places they are needed in order to deliver maximum benefits. At its heart is vision. Without a clearly stated vision which is strong enough to inform every act by every individual and every organisation and to guide the product of every piece of work, prioritisation is

impossible. The wastefulness of not understanding priorities and deadlines is now clearly understood by all who were involved with Y2K.

Priorities reflect motives. In addition, motives are often left unstated and exist in the destructive form of 'hidden agendas'. Vision is at the heart of countering this destructiveness. Vision must be strong enough to enable relationships to be developed which can be effective in publicly setting priorities and deadlines. Y2K highlighted the impossibility of delivering strategic change without the vision and leadership at the heart of this lesson.

What Ownership of Risk Means and Implies

In essence this lesson is about the empowerment of people who are in appropriate positions to deal with risks once they have been triggered. The requirement for it is alluded to in the paragraph above dealing with managing large and complex change programmes. The risk management model used as Kenya's Y2K paradigm identifies three characteristics which risk owners must have. These are:

- proximity – risk owners must be close to where the risk will strike if and when it is triggered. The implication here is that risk management cannot be centralised. It must be devolved to precisely where it belongs.
- interest – risk owners must stand to lose something as a result of the potential risk. Interest might be reflected in professional, financial, social, political, career, physical or any other aspect of life which is put at stake by the risk.
- power – risk owners must have power to do whatever is required at the time it becomes necessary in order to manage the risk and its impact.

This crucial lesson implies an extension of due diligence into every corner of the economy and society. On its own it is capable of becoming the basic building block of national development in the new century.

The need for healthy, honest and open relationships – interdependency, communication and information sharing

Y2K made it clear that the whole world is an interdependent network of demand chains and supply chains within which the need for healthy relationships is critical. It is worth repeating that not only was Kenya's Y2K success a joint public-private sector enterprise, it also saw Kenya playing a

full part in regional and global information sharing networks that comprised public and private sector operations across the world. Aside from all the obvious benefits of such relationships, huge economies of scale were brought into play which in real terms extended the resource base of every country. At the same time they gave an indication of what the future has in store.

The fact is that the 'E-future' – E-commerce, E-business, etc. – is not entirely a technological challenge, in fact the technology is hardly a challenge at all. The future challenge will revolve around relationships. Progress will only become possible where there is trust, shared understanding, management of common risk and joint strategies for development. Both internally and externally, relationships must be strong enough to support all the opportunities the E-future makes possible and to rapidly resolve issues as and when they arise.

The Role of Technology in Economic and Social Life

Relationships apart, the clear lesson Y2K taught the country was that everything modern life depends upon comes to us courtesy of technology either directly or indirectly.

This is obviously true for the more obvious aspects of Information Technology, Telecommunications, banking and the E-commerce developments referred to above. That said though, the nature of the dependency is now more precisely understood as a result of Y2K. Equally, as is now clearly understood, aspects of life previously unconsidered in this connection – food production and distribution, retailing, transport, the hospitality industry, health service provision for example – all are technology dependent to a greater or lesser extent.

Y2K enabled the nature of these dependencies to be explored and, as a result, more fully understood. The crucial Y2K lesson is that there is clearly a need to bring together all the disparate bodies charged with responsibilities for technology and for clear national strategies to be drawn up to enable technological opportunities to be exploited and technological benefits to be delivered to the nation.

This review began by saying relationship-building is the only way forward and that all the lessons learnt are interdependent. What this boils down to is

that the country's technology strategy is far too important to be left to any single group to develop whether that group comprises technologists, politicians or academics. The strategy must belong to the nation and must have a vision strong enough to deliver success. Exactly like Y2K did.

Data Integrity – cornerstone of the Information Age

We live in the information age. An age in which accurate and timely information is what keeps the world going round. Computer systems – what we now more commonly call IT or Information Technology – used to be called Data Processing. As the name implies, Data Processing received some data, and processed it in some way to produce information. Data was the key input. It still is. Data integrity was vital. It still is. This fact alone gave rise to the guiding principle that accurate information requires accurate data. Hence the famous law: *garbage in – garbage out* became the cornerstone of the entire industry.

At a time when people's lives have an almost total dependency on electronics and the various outputs of information systems, Y2K lessons provide a nation-wide guide in managing this very real and ever-present threat.

Key Ingredients of Success

The following vital elements of success are present in every undertaking:

- an accurate definition of the problem
- a full understanding of the nature of the challenge
- creation of a vision powerful enough to meet the challenge
- adapting the Risk Management Methodology to deliver the vision
- setting goals within the vision
- providing leadership to allow goals to be met
- developing appropriate relationships both within the national economy and internationally to meet goals and deliver the vision
- adherence to International Best-Practice standards at all times especially for reporting and accounting
- taking every opportunity for communication
- adherence to the KISS – Keep It Short and Simple – Principle

XVII. LESSONS LEARNT BY SECTOR

Healthcare Sector

Following post-Y2K assessment of the sector, many organisations commented on the success of the awareness programme. The use of face-to-face briefings, newsletters and emails contributed greatly to the success of the sectoral programme.

Another contributory factor was the public-private sector co-operation. It is apparent that they can work together and share information where this is shown to be for the common good.

Issues that impacted negatively on the programme were communication and continuity. Communication using telephones, faxes and emails proved to be difficult in some provinces.

It is vital for national projects of this nature to have proper communication facilities across the board. Continuity proved a problem as a large number of senior staff changed early in the project's life. To a large extent, these problems were overcome, however, they inevitably caused delays and probably reduced the efficiency of the programme. In such volatile circumstances, the lesson is to intimately involve several senior managers to ensure continuity.

Way Forward: Future Challenges within the Sector

It is not merely possible for better health outcomes for Kenya's poor to grow out of the country's Y2K programme, it is essential that they do. As a vehicle for delivering these benefits, an entirely similar methodology to that used in meeting Kenya's Y2K challenge could be utilised.

Taking advantage of the opportunities now available requires everyone involved to move quickly before momentum is lost, relationships decay and opportunities pass.

Any such initiative would need to be based at the Ministry of Health. Work would need to be in line with Kenya's National Health Sector Strategic Plan and form a much-needed bridge between public and private sectors.

Improving the quality of care available to Kenyans within existing resource constraints is the critical challenge that such an initiative could begin to address.

Issues that need to be urgently addressed include:

- The timeliness, quality and availability of information
- The alignment of donor-funded vertical projects to the overall health sector without imposing undue restrictions
- The retrieval of public health-orientated information from the private health sector

Kenya's Electricity Industry

Thanks to Y2K, both KENGEN and KPLC have moved to a new level of capability. Project Management standards within both companies have improved significantly developing a capacity and confidence to tackle large and complex challenges in the future.

Two crucial lessons stand out among these new industry capabilities:

- contingency plans and disaster recovery procedures must be available at all times throughout the industry. Further, all such procedures must be fully documented and maintained. They must be regularly updated to take account of the changing context in which they must operate, and all the people involved must be fully and appropriately trained.
- finally, Y2K brought home the importance of the customer – supplier relationships that are the very mortar of a developed economy. Communication is vital in managing these relationships. The days of taking such relationships for granted ended with Y2K.

Banking and Finance Sector

Global Networking

It needs to be stated clearly at the outset that Y2K presented Kenya and the whole world with a unique challenge the response to which demanded ways of thinking and working which had previously neither been tried nor even considered possible. Y2K taught us much about how the world works; the world is both more resilient and more connected than we knew.

In industries like banking and finance information was exchanged and shared around the world in a way never seen before. The smooth transition of the Kenyan banking and financial sector was wholly attributed to the elaborate networking arrangement starting globally with the Joint Year 2000 Council of the European Investment Bank since early 1977; the regional East African Y2K initiative sponsored by the Department for International Department of the United Kingdom; the International Y2K Cooperation Centre, the African Region Y2K Working Group, the National Y2K Co-ordination Centre and the commitment of the financial market regulators and supervisory authorities in this regard.

Challenges for the Financial Market Authorities

Capacity-building challenge remains with the market regulators and supervisory authorities. Most institutions have modernised their IT systems with the latest available versions. For financial system stability the authorities have to immediately avail the right expertise to oversee the smooth operations within the markets especially in the area of E-Commerce, EDP audit systems, etc.

National payment and settlement arrangements

It has long been understood throughout the banking world that payment and settlement arrangements are the very heart-beat of efficient financial systems. Furthermore they are the cornerstone of stability. Without them there can be no progress towards the E-business future.

Within Kenya such arrangements must, as a matter of extreme urgency, be brought into line with the guidelines set out by the Basle Committee.

Computer Fraud

As institutions adopt high-powered computerised systems handling large batches of transactions, the exposure to fraud is increased because the ability to understand and operate computers is generally restricted to a few people in the organisation. The major challenge is having comprehensive internal audit controls while at the same time developing the capacity of the organisation's security staff to detect and prevent computer fraud.

On a global basis, capacity building within the Banking Fraud Department must be a pre-requisite. The growth of internet trading makes security and data integrity a primary concern.

XVIII. WHAT AFTER Y2K ?

Development of IT in the Country

While addressing Y2K, it became evident that Kenya has an IT infrastructure and trained personnel base on which to build and exploit IT for accelerated economic and social development. Kenya has got a pool of trained personnel in IT which would rank it among the top three in Africa. This is a critical ingredient to make Kenya an IT Hub in the region and make it a key participant in the information revolution. Most countries in the industrialised world are moving from industrialisation to the digital era with accompanying better living standards for their citizenry. The economic gap between the developed and developing countries is bound to widen faster if the developing countries do not embrace the digital revolution.

The question then is: Is Kenya ready to exploit the lessons and awareness created while addressing Y2K by:

- Developing e-business through reliable and affordable telecommunications?
- Government joining and spearheading the use of internet information and communication technology?
- Developing national Information and Communications Technology (ICT) strategy and establishing a national body to co-ordinate use and development of Information and Communications Technology (ICT) and social as an ingredient of economic and development?
- Building information communities through education and rural access to modern communications?

The model of the private and the public sector working together on Y2K has been very successful and it is recommended that the development of ICT in the country becomes a national initiative driven by both the public and private sectors. Again drawing on the structure of the National Y2K Co-ordination Centre, it is proposed that the Centre be reconstituted as a National Information and Communication Technology Secretariat funded by the public sector, private sector and our Development partners. It is recommended that the proposed Centre's first task would be the development of a National ICT

Policy and development of appropriate cyber laws. In addition among the Secretariat's tasks should be the development of incorporating ICT in the management of the public sector. However the proposed Secretariat should operate with minimum bureaucracy with clearly defined terms of reference and deliverables. The proposed Secretariat would work under the auspices of a legally constituted body, consisting of public and private sector representation, with mandate and set deliverables to develop ICT in Kenya for accelerated economic growth.

Strengthening Disaster Preparedness

The nature of Y2K was such that failures could have occurred simultaneously and in different locations stretching resources and the ability to respond. It is the possibility of this scenario that drove the global community to address Y2K as an issue of survival. It considered the greatest cost of Y2K was in doing nothing. Identification and management of risks and contingency planning were critical ingredients in addressing Y2K. However, having addressed the Y2K problem and put contingency plans in place, an additional element was disaster recovery and event management over the date-transition period. All critical sectors of the economy over the date-change period had Command and Emergency Response Centres with key personnel on duty round the clock. Their responsibility was to ensure, that in case of failure, services or data were restored quickly. The different Command and Emergency Response Centres were networked through physical location addresses and telecommunications. While these were targeted to possible Y2K failures, there are lessons which were learned and which could be extended in the management of man-made and natural disasters within our nation and region.

It is recommended that deriving from the Y2K experiences, there is need for strengthening national disaster management and recovery systems to be able to minimise loss of life and property and to recover in the shortest time possible. Critical ingredients of disaster management are trained professionals, an informed population and tested plans. It is recommended that such a body be adequately funded and resourced.

XIX. RECOMMENDATIONS

Several lessons (which are discussed elsewhere in the report) were learnt while addressing Y2K as a national challenge. Y2K is soon becoming history but from the lessons learnt, some recommendations are made below to enable Kenya to draw benefits for social and economic development in the new century from the investments made during addressing Y2K.

Y2K Management Model and Roadmap to the Future

That the Y2K management model be adopted as standard for managing large and complex projects in Kenya in the future. The methodology had the following key elements:

vision driven

- public and private sector collaboration
- managed stakeholder value
- managed operations
- managed customer expectations
- managed people's expectations

risk management

These were the cornerstone of Y2K success. Properly implemented and in the proper hands, the Y2K methodology will deliver co-evolution benefits in any and every sphere of life, including such current challenges as:

- managing the HIV-AIDS challenge
- poverty alleviation
- delivering industrialisation by 2020
- delivering the constitutional review

National Disaster Management

Y2K was treated as a potential national and global disaster both from the technical and life-threatening aspects. As a country, over the date-change period, command and emergency response centres were in place in all critical sectors to mitigate against any potential disaster and to manage quick recovery. **It is recommended that national disaster arrangements be reviewed to ensure any unforeseen man-made and natural disasters**

within our nation and the region have negligible loss of life and property and recovery is achieved within the shortest time possible.

Information and Communication Technology (ICT) Development

Many nations are now evolving from industrialisation to information and digital societies. The World Bank has recognised that the emerging economies risk continuing being impoverished if they do not join in the information revolution. The World Bank has gone further to introduce beginning in May 2000 a **softbank emerging markets support programme** aimed at providing technological, legal and management support to internet business entrepreneurs in the developing world. At national level, one benefit coming out of addressing Y2K was sensitisation and realisation of the critical role technology and communication have and can enhance in the country's economic and social development.

It is recommended that a national body (consisting of both the public and private sector) be established to foresee the evolution and development of ICT as an integral and critical component of both national and regional development.

It is in this context that **it is also recommended that the National Y2K Co-ordination Centre be reconstituted as an ICT Secretariat.**

Cyber Laws

As the 21st Century progresses, there is a pressing and urgent need for the country to evolve appropriate cyber legislation to provide a legal framework within which ICT can flourish. This can be undertaken as one of the terms of reference of the proposed ICT (council) body.

ICT Capacity-Building within the Public Sector

There has been substantial investment, upgrading and modernisation of IT and communications within both the public and private sectors while addressing Y2K. The government alongside the private sector gave leadership in

addressing Y2K and it is recommended that the Public Sector initiates accelerated upgrading of its capacity both human and technical to be at par with the private sector if Kenya has to join the digital society and the E-future.

XX. ANNEXURE 1

Constitution of National Y2K Steering Committee

Ms. M. K. Chemengich Permanent Secretary Ministry of Finance <i>Chairman</i>	October 1998 - June 1999
Mr. Martin L. Oduor-Otieno Permanent Secretary/Treasury Ministry of Finance/Planning <i>Chairman</i> <i>Member (as Chairman of ICPAK)</i>	July 1999 - April 2000 October 1998 - June 1999
Mr. Crispus Mutitu Permanent Secretary Ministry of Energy <i>Member</i>	October 1998 - June 1999
Mr. Stanley Murage Permanent Secretary Ministry of Transport and Communications <i>Member</i>	October 1998 - June 1999
Mr. Philomen Mwaisaka Permanent Secretary Ministry of Health <i>Member</i>	October 1998 - June 1999
Mr. Chris Kirubi Chairman Kenya Association of Manufacturers <i>Member</i>	October 1998 - April 2000

Mr. Kassim Owango Chairman Kenya National Chamber of Commerce <i>Member</i>	October 1998 - April 2000
Mr. Ashok Shah Chairman Association of Insurers <i>Member</i>	October 1998 - April 2000
Mr. Dilip Shah Chairman Kenya Institute of Bankers <i>Member</i>	October 1998 - April 2000
Mr. Micah Cheserem Governor Central Bank of Kenya <i>Member</i>	October 1998 - April 2000
Mr. Z. K. Cheruiyot Permanent Secretary Office of the President - Provincial Administration & Internal Security <i>Member</i>	October 1998 - April 2000
Solicitor-General Attorney General's Chambers <i>Member</i>	October 1998 - April 2000
Hon. Dr. Shem Ochuodho Chairman Computer Society of Kenya <i>Member</i>	October 1998 - April 2000

Amb. Mwanyengela Ngali
Permanent Secretary
Ministry of Energy
Member

July 1999 - April 2000

Mr. Titus Naikuni
Permanent Secretary
Ministry of Information, Transport
and Communications
Member

July 1999 - April 2000

Prof. Julius Meme
Permanent Secretary
Ministry of Health
Member

July 1999 - April 2000

Mr. Amos Kimunya
Chairman
Institute of Certified Public Accountants of Kenya
Member

July 1999 - April 2000

XXI. ANNEXURE 2

Launch of National Y2K Steering Committee

Gazette Notice No.6002

IT IS notified for the information of the general public that a National Y2K Steering Committee has been established. The committee shall comprise the following:

Permanent Secretary, Ministry of Finance (*Chairman*)

Members:

Permanent Secretary, Ministry of Energy
Permanent Secretary, Ministry of Health
Permanent Secretary, Office of the President
Governor, Central Bank of Kenya
Chairman, Kenya Association of Manufacturers
Chairman, Kenya Institute of Bankers
Chairman, Kenya Institute of Insurers
Chairman, Kenya National Chamber of Commerce
Chairman, Kenya Institute of Chartered Accountants¹
The Attorney-General²
Chairman, Computer Society of Kenya³

The Terms of Reference of the Steering Committee are:

- a) Develop and supervise the implementation of a National Plan
- b) Initiate the formation and co-ordination of sectoral task forces
- c) Carry out risk analysis and develop impact management for each of the affected sectors

¹ Substituted by Chairman, Institute of Certified Public Accountants of Kenya (ICPAK)

² Substituted by Solicitor-General

³ Chairman, Computer Society of Kenya added as Member after Gazette Notice

- d) Develop and supervise the implementation of the National Contingency Plans
- e) Advise on the legal implications of non-compliance by different sectors
- f) Solicit for funding both locally and from donor agencies for solving the problem effectively
- g) Establish a National Y2K Co-ordination Centre with its own secretariat and a National Resource Centre where co-ordination efforts for solving the problem nationally will be driven from. The Centre should be less bureaucratic, non-profit making and action/ result-oriented
- h) Deal with other issues that are pertinent to the problem such as creating awareness, anti-dumping efforts and disposal of non-compliant equipment
- i) Production of at least a quarterly report for information on the National efforts and preparedness in solving the problem.

Powers of the Committee:

- a) regulate its own procedure;
- b) determine its method of work;
- c) appoint such sub-committees as may from time to time be necessary for the furtherance of its terms of reference;
- d) engage the services of such consultants or experts as may be found necessary for the execution of its terms of reference and shall formulate the terms of reference of such consultants or experts and supervise their work ;
- e) do or perform such other things or acts as are necessary or expedient for the execution of its terms of reference

Secretariat

The Secretariat of the committee will be based at the suitable offices to be identified by the committee and notified to the public.

Reporting:

The committee shall discharge its functions with all due diligence and speed and shall submit to the Minister for Finance:

- a) monthly reports of its deliberations with interim recommendations where appropriate; and
- b) its final report not later than eighteen (18) months from the date of publication of this notice.

Dated the 19th October, 1998.

SIMEON NYACHAE
Minister for Finance

XXII. ANNEXURE 3

Schedule of National Y2K Steering Committee Meetings

Month	Date and time of Meeting		
January	Wednesday 27th	1999	2.30 pm
February	Thursday 25th	1999	2.30 pm
March	Thursday 25th	1999	2.30 pm
April	Thursday 29th	1999	2.30 pm
May	Thursday 27th	1999	2.30 pm
June	Thursday 24th	1999	2.30 pm
July	Thursday 29th	1999	2.30 pm
August	Thursday 26th	1999	2.30 pm
September	Thursday 30th	1999	2.30 pm
October	Thursday 28th	1999	2.30 pm
November	Thursday 25th	1999	2.30 pm
December	Tuesday 14th	1999	11.00 am
December	Tuesday 28th	1999	11.00 am
January	Thursday 13th	2000	2.30 pm
March	Thursday 9th	2000	2.30 pm

XXIII. ANNEXURE 4

Press Clips

1. In general Africa countries successfully organised and managed their Y2K situation while the participating Africa countries benefited from the hard work and tremendous eradication of their Regional Co-ordinator from Gambia. Earlier involvement of Nigeria and a greater leadership role by Kenya or South Africa may have created greater public confidence...

*The international Y2K Co-operation Centre draft report
7th February 2000, Pg. 3, Paragraph 4*

2. In Kenya itself, they are doing a remarkable job in many areas of preparing to deal with the millennium bug... and in many ways is ahead of key U.S. Cities with respect to power, telecommunications and healthcare...

Chuck Ashman, President, U.S. Millennium Information Service

3. As you approach the City from the Nairobi Airport, there is a huge banner reminding everyone of the countdown to Y2K. I have never seen one like it in any American or European City...

Chuck Ashman, President, U.S. Millennium Information Service

4. ... and found out, to my surprise, that in many ways, Kenya is ahead of New York in its Y2K thinking...

Chuck Ashman, President, U.S. Millennium Information Service

5. ... Anti-Y2K funds were well spent...

Fernando Burbano, the US State Department's Chief Information Officer

6. ... Programmers sighed with relief after the smooth roll-over. Missiles remained undisturbed in their silos and planes flew through the air...

Peter de Jager, Consultant on Y2K issues

7. ... Long after people forget about Y2K and its short-term economic effects, ... the US economy will continue to benefit from what has been a historic push to modernise

Lou Morcoccio, Research Director at Gartner Group

8. ... Many companies used the problem as a reason to modernise ahead of schedule, raising the prospect of increased productivity in the coming years.

*Jeremy Hildreth, Senior Economist at American S Kandia –
Financial Services firm in Connecticut*

9. ... There was jubilation at Mombasa Container Terminal as French Vessel, MV Nord Sun, finished loading export containers at 12 Minutes past mid-night on the roll-over date before setting sail at 12.30 a.m. “We were all quite apprehensive as the cranes worked the vessel ... it was such a relief when everything went without a hitch”.

KPA's Y2K Committee Chairman, Mr. Walter Otieno

10. ... No Y2K glitches at Kenya Power

KPLC Management

11. ... Kenya's response to Y2K is ranked high internationally – alongside Germany, Japan and South Africa in terms of readiness...

US based Gartner Group

XXIV. ANNEXURE 5

Y2K – neither Hoax nor Illusion

Proving a negative

Globally, and mostly unseen, an unbelievable effort in project planning and in implementation management is what resulted in the absence of the feared Y2K disruptions.

The authors of this report, having played their part in that effort, belong, practically by definition therefore, in the camp that says Y2K was positively not a hoax.

Proving or disproving hoax accusations though is impossible. Pursuing the issue in hoax terms is destructive and absolutely counter-productive. It is as if a man who takes out an insurance policy on which he never has to claim, subsequently accuses the insurers of hoaxing him into wasting scarce resources buying cover.

Expectation Management

The fact is that in a world where expectations of success are tempered by experience of repeated failure, meeting the Y2K challenge was a resounding success. The whole world knew the uncertain nature of the challenge. Its deadline was fixed and totally non-negotiable and, unlike any other project except perhaps a televised space-shot; its success or failure was obvious for all the world to see.

Distrust

Low expectations of success are compounded in many parts of the world by a distrust of the way capitalism works. There is a feeling of powerlessness in the face of mega-corporations who are quite capable of using something as trivial as a date-change to further exploit their captive market.

Uncertainty, as has been pointed out elsewhere in this report, makes a difficult environment in which to deliver success. Uncertainty brings suspicion and

paranoia to the forefront of people's consciousness. Uncertainty is exacerbated by the absence of trust.

A duty of care is no illusion

Y2K due diligence, which is covered elsewhere in this report, is based on the legal notion that those in power owe a duty of care to those in whose name they exercise power. The nature of that due diligence, as the following illustrates, absolutely refutes the possibility that there was any hoax:

If a man, suspicious of the truth, turns a blind eye to it, and refrains from enquiring – so that he should not know for certain – then he is to be regarded as knowing the truth. This 'turning a blind-eye' is far more blameworthy than mere negligence.

*Lord Denning
Master of the Rolls 1976*

Accusations anticipated

From early March 1999, throughout the year, Kenya's National Y2K Co-ordination Centre produced a weekly '***Millennium Bug***' column which appeared in the Business News Section of the Daily Nation newspaper. The column subsequently won the newspaper a Computer Society of Kenya award.

In anticipation of the possibility of hoax accusations, the column submitted on 15th August 1999 opened as follows:

Y2K – the story so far...and the history to come

Whatever happens after the clock strikes midnight on Friday, 31st December 1999 commentators and historians are going to have a field day.

If the northern hemisphere is plunged into midwinter darkness with

nuclear power stations heading for spontaneous meltdown, with roads clogged by motorists lucky enough to have gasoline but nowhere to go, with airports clogged by Jumbos and Airbuses indefinitely grounded, with taps running dry, with the army on every street corner and with the only source of news being loud-hailers mounted on official cars, the commentators and historians will shake their heads solemnly and say 'I told you so'.

If, on the other hand, January 1st dawns bright and crisp, with the technology the world depends upon so totally having clicked over seamlessly into the new century and with millions of workers having burned the midnight oil on emergency standby in thousands of offices, wondering, between yawns, why they had to miss their New Year's Eve parties and what all the fuss was about, the commentators and historians will nod their heads solemnly and say 'I told you so'.

Win, lose or draw, the history of Y2K, like every other history since the world began, will be written with the benefit of hindsight. And hindsight comes with twenty-twenty vision thus making experts of us all. Which is ironic indeed since there are absolutely no experts when it comes to Y2K.

There were no Y2K experts

As the above piece makes clear, there were no Y2K experts. There can only be experts when there is experience on which to base expertise and, as has been repeated throughout this report, Y2K was a unique – never-before-never-again – challenge. Times change, quite literally in the case of Y2K, and the date-change made experts of us all.

Back in August 1999, the article carried on to examine the work of real experts – safety engineers in the petro-chemical industry was the example used – and compared their impact on their industry to what was having to be done to ensure 'life as normal' against the background of Y2K uncertainty.

What versus when

The crucial difference was that petro-chemical safety engineers, thanks to their huge body of expertise know with a great degree of certainty precisely *what* will happen in a given circumstance. The problem is, they don't know *when* that circumstance is going to happen. That is the nature of their uncertainty and their challenge.

With Y2K, the whole world knew precisely *when* it would happen. But nobody – absolutely nobody at all – knew *what* would happen.

Wisdom before the event

Wisdom after the event has the capacity to make anything – war, disaster, failure, success - appear a hoax. Or if not a hoax, at least to have proved unnecessary. With hindsight there would be no world wars, the Wall Street crash would not have happened and the Titanic would be a floating classroom where children learn history.

Y2K due diligence provided non-experts with the world's best-ever attempt at *wisdom before the event*.

Gaining expertise – one example

Two or three years ago we really were not sure about whether aeroplanes could fall out of the skies due to Y2K. But by late 1998, aircraft manufacturers had found out enough to know what could go wrong, how to fix it, and what would not go wrong. So they became confident first and then went on to prove their confidence to the satisfaction of their regulators and their stakeholders (aircraft owners, pilots, operators, passengers).

Similarly, on the ground, air traffic controllers also had to find out what could be directly or indirectly affected by Y2K in their systems, then ensure that correct solutions were applied. After doing so, they needed to convince their regulators and their stakeholders that they had solved their Y2K problems. Meanwhile, behind the scenes, some very technical engineering work was also being done. In a nutshell, this was the type of project planning and implementation management work that enabled airplanes to be authorised to fly as usual after 31st December 1999 despite Y2K fears. And many of the spectacular stories on possible Y2K failures were likewise also obsolete fears,

dating from when sufficient research had not yet been done on the eventuality of problems.

Living proof

Anyone could contact any major service organisation and ask about systems which they identified as critical to product and service delivery, but which would not have performed properly due to an incorrect interpretation of the century in dates. Hoaxes do not demand such due diligence.

The US view of the hoax

As the end of 1999 approached, Y2K changed rapidly, almost hour by hour. So much so that it became virtually impossible for press and TV reports to reflect the accurate position. In addition, as the Y2K profile rose and it became part of everyday language, so it became used willy-nilly as a tag for any unsubstantiated scare story and rumour. Just as now, post-Y2K, it was used to tag spurious hoax stories.

In an interview with the British right-wing magazine *The Economist*, John A. Koskinen, the US Y2K Co-ordinator had this to say when asked what had happened to the famous fear of embedded chip failures:

When people started looking at this issue, there was no way of knowing what we would find. Again, fortunately, the problems turned out to be less significant than feared (there are as many as 50 billion chips in the world) and tied primarily to complex systems and found in control panels and operations rather than hidden away out of sight.

This is a perfect example of the problems with media coverage of complicated, serious problems. As industry after industry reported finding no "show stoppers" but only risks of degraded service if control and monitoring systems weren't fixed, the doomsayers and many in the media never caught up with the information. Or, in far too many cases, they argued you couldn't believe large companies and government organisations putting out this information because they were covering up the magnitude of the problem either to protect against liability or overreaction by the public.

Koskinen went on, "I kept reminding the media that this argument made no sense in the US since everyone in a position of responsibility would be easily found after January 1st and held accountable if they had misrepresented the situation and their systems failed. We were not just managing to December 31st. We were managing through the roll-over...the exaggeration, the "hype," if it existed, occurred because some people seem to be unwilling ever to believe companies or governments when reporting on major issues. Unfortunately, in the past, cover-ups or dissembling by some organisations has created some of this distrust."

Was Y2K a waste of money?

For a final word on the issue, Koskinen's response to the question 'was Y2K a waste of money and wouldn't it have been better to, with hindsight, have waited to see what failed and then to fix it?'

He replied thus:

"The failure of a US Defense intelligence satellite system --even after fixes -- demonstrates that failures would have been critical. Had they waited, the fix would not have been a simple matter of two days. ***Fixing the system would have taken the same months it took to get the system to the stage it was when a part of it still failed.*** Ask a bank or securities firm how long it would have taken them to get their systems to operate if they had simply waited, and you'll find that the time after 2000 would have been the same as the time spent before 2000. The financial meltdown that would have resulted from waiting to see would have been disastrous".

Money well spent?

"Was every dollar well spent? In hindsight, we'd always do some things differently - my analogy is when you finished a term paper in college you always thought, "If I'd known this was what it would look like, I could have avoided reading a lot of books and articles". But remembering the unprecedented, and to some extent unknowable nature of the challenge people faced several years ago, I think the money was very well spent, particularly because of the increasing learning curve that was shared with everyone".

How the world works – the last word

“Y2K has taught us a huge amount about how the world – and the communications media – works. The world is both more resilient and more connected than we knew before. Working together, nations are capable of managing a tough global challenge. The world’s information systems have had a complete health check-up and they are now passing the physical examination. Thanks to Y2K we’re in good shape for the new century. That’s quite an achievement for a ‘hoax’”.

XXV. ANNEXURE 6

Reported International Y2K Failures During Roll-over Period

REGION	COUNTRY	NATURE OF GLITCH	SOURCE
ASIA	Australia	Telstra reporting phone failures in South Australia, particularly from New South Wales and Victoria; problem being attributed to software failure. Also, Excel spreadsheets are experiencing software glitches	Other and Media
SA	Brazil	Sao Paulo glitches in toll roads and administration	Media
	Brazil	Glitches in toll roads and Dr.'s offices (appointments)	Media
	Brazil	Glitches with some printers in convenience stores	Media
NA	Canada	Computer controls on cell doors in British Colombia prison failed	Other and Media
ASIA	China	Govt. computers encounter minor glitches, Central Bank branches reporting glitches, taxi meters reporting failures	Media or Other
CAC	Costa Rica	Minister of Science & Technology reports minor problem in billing system of a petroleum refinery	Other
WE	Denmark	Second-largest bank identified glitch in Unitel payment and information system for corporate clients, patient record problem reported	Media
EUR	France	Syracuse II military satellite glitch found at ground stations relating to communications	Media
AFR	Gabon	There was a very isolated incident with some accounting systems - but it is being taken care of (has since been apparently resolved)	National Co-ordinator

REGION	COUNTRY	NATURE OF GLITCH	SOURCE
WE	Germany	Local savings bank in Cologne reporting balance errors	Media
WE	Greece	Older models of cash registers throughout Greece are experiencing Y2K glitches, showing the year 1900	Other
CAC	Grenada	A compliant version of the computer systems for customs services was not commissioned as of December 30 th , 1999, however, manual backup systems proved just as efficient. Compliant systems will be installed by January 30 th , 2000.	National Co-ordinator
CAC	Grenada	Only the payroll (internal) component of the sole provider of water in Grenada, the National Water and Sewerage Authority (NAWASA) is not yet compliant. Payroll systems will be compliant by January 15 th , 2000, and systems will next be used on January 30 th , 2000.	National Co-ordinator
ASIA	Hong Kong	A blood sample-analysing machine showed wrong dates, but the machine still functioned.	Other
ASIA	Hong Kong	Minor glitches in govt computers, glitches in "breath-testing" for sobriety	Media
ASIA	Indonesia	At midnight 31 st -December the Central Bank clock showed the year 1900, but was soon fixed to show 2000.	Media
MENA	Israel	Defense, public and government institutions and banks reporting minor Y2K glitches	Media
WE	Italy	Data functions in court systems encountered Y2K date problems	Media
CAC	Jamaica	Computerised traffic lights at eight intersections encounter Y2K glitches,	Media
ASIA	Japan	One train ticket distribution machine printed the wrong date on the passengers' tickets on New Year's day.	Media
ASIA	Japan	Shika NPP had non-power related computer glitch; Tokyo Electric Power reported monitoring failure; a total of 22 reports of minor glitches reported in power; Japan	Media

REGION	COUNTRY	NATURE OF GLITCH	SOURCE
		Railway reported a Y2K vending glitch; Computer system which collates flight and weather information for small planes/helicopters stopped functioning; NTT DoCoMO (mobile telecom) reporting slight access problems	
ECA	Kazakhstan	A report was received from Ekibastuz Hydroelectric Power Station-2 that technology process has been handled manually since January 1, 2000 because the Y2K non-compliant computers had not been replaced due to absence of funds. Manual handling causes certain difficulties, since at every power unit there are 250 devices to be controlled.	National Co-ordinator
ECA	Kazakhstan	In one of the government buildings a Y2K problem occurred in the system that controls air conditioning, elevators, etc. After resetting the date to 1999 the system has been functioning normally. They need to upgrade the software provided by "Johnson Control Company".	National Co-ordinator
ECA	Latvia	Customs Board reporting Y2K software problems	Other
ASIA	Malaysia	Penang province satellite television went out over-roll-over, Medical equipment Y2K glitches in defibrillators and heart monitors	Other and Media
AFR	Mali	Y2K glitches hit Mali railroad system. Maritime Sector: Port of Long Beach discharge monitor computer malfunctioned, cause unknown	Government and Media
ECA	Moldova	Some minor problems with computers resetting to 1994. Easily fixed.	Other
ASIA	Mongolia	A few railroad ticket counters with outdated computer systems could not function on January 3 rd . The computer problem was fixed on the same day with no major impact.	National Co-ordinator

REGION	COUNTRY	NATURE OF GLITCH	SOURCE
AFR	Namibia	A small government housing tenant database system handling approximately 1000 records does not correctly recognise year 2000 dates. The database runs in a FoxPro version 5 environment that needs upgrading to be Y2K compliant. This only affects a minor record-keeping function of the Ministry of Works, Transport, and Communication.	National Co-ordinator
AFR	Namibia	Channel 7 Radio Station report that their advert scheduling computer failed to function correctly as from 1 January for Y2K related reasons. Adverts continue to be scheduled and aired as per normal, but are scheduled manually	National Co-ordinator
CAC	Nicaragua	Supreme Court and Min. of Agriculture reporting Y2K failures as are some 800 medium-sized companies	Other
AFR	Nigeria	A minor Y2K glitch was experienced in Port-Harcourt refinery where the Network Operating System could not fix the date for the maintenance and material management system. The glitch was cleared and normal operations attained within 3 hours.	Other
AFR	Nigeria	Nigerian Telecommunications Company (NITEL) discounted subscribers and service providers who were thought to be non-compliant. Few of them have complied and are reconnected back by January 2 nd , 2000.	Media
ASIA	Pakistan	(Unverified), reports of the Stock Exchange system having Y2K glitches	Media and Other
ASIA	Philippines	A few cases of fax machines or other non-critical electronic equipment displaying the wrong date.	
WE	Portugal	Govt' databases experience Y2K glitches in hospital admissions and payment systems	Media
ASIA	Republic of Korea	Apartment Building reported heat and hot water loss due to Y2K	Media

REGION	COUNTRY	NATURE OF GLITCH	SOURCE
ASIA	Republic of Korea	One medical equipment (density measurement) failed	Media
ECA	Russia	Minor glitches in management systems at Russia's NPPs reported	Other and Media
AFR	Rwanda	Gov't reporting customs failure due to Y2K. Remediation planned. Contingent plan is to use the manual systems until old systems are replaced by March 2000.	National Co-ordinator
WE	Spain	2 of 9 nuclear reactors reported as having glitches	Media
ASIA	Sri Lanka	At Sri Jayawardenapura hospital the "Holter" (24 hr.) ECG Monitoring Unit changed it's date to 1994 with the roll-over. The analysing part of the unit is not compliant and cannot be used. The supplier had certified this machine purchased in 1996 to be Y2K compliant. The Holter ECG Monitoring unit was the only unit of its kind in the hospital is an American instrument. When the date was changed to 2000 manually the machine changed to 2094 and now the analyser cannot be used.	National Co-ordinator
	Sweden	dialysis machine encountering Y2K problems	Media and Other
WE	Sweden	3 Hospitals reporting problems with heart monitoring equipment and with electrocardiograph machines in Uppsala, Karlstad and Linkoping, bank browser failures	Media and Government
ASIA	Taiwan	A blood pressure measuring machine showed wrong dates in one hospital in Southern Taiwan.	Other
ASIA	Taiwan	Hospital registration problems, fixed right away.	Other
AFR	Tanzania	Zanzibar reporting television transmission problems	Media
AFR	Uganda	Uganda's examinations authority, UNEB, was unable to install compliant systems in time, but was able to put in place	Media

REGION	COUNTRY	NATURE OF GLITCH	SOURCE
		contingency measures to process examinations on time. UNEB handles the Primary Leaving Examinations, Uganda Certificate of Education, and Uganda Advanced Certificate of Education exams, as well as the exams for Stenographers and some technical colleges. The problem has been solved by using the Y2K-compliant systems at the Institute of Teacher Education Kyambogo (ITEK) or freezing the dates on the examination board's old system and using it.	
WE	United Kingdom	The Medical Devices Agency issued a Y2K special issue advice regarding Gambro Ak 100 and Ak 200 haemodialysis units. These can show incorrect date and time which may result in failure of the auto-disinfect cycle.	Other
	United States	SMS Patient Management systems reported as failing in Western U.S.	Media and Other
NA	United States	Bank credit card companies reported to financial regulators on January 6 that they have identified, and are taking steps to correct, a potential Y2K glitch involving some credit card transactions. According to the industry, merchants did not make use of free upgrades provided in 1999 for a software package manufactured by CyberCash Inc; the glitch could produce duplicate postings of charges made after January 1. The problem primarily affects smaller retailers, as larger retailers generally have their own software. Credit card companies normally look for duplicate charges and typically see 2,000 to 3,000 duplicates out of 100 million transactions a day.	National Co-ordinator
NA	United States	Florida and Kentucky unemployment insurance benefit systems encountered a Y2K glitch in an automated telephone call	National Co-ordinator

REGION	COUNTRY	NATURE OF GLITCH	SOURCE
		processing system. The glitch in custom code prevented some claimants from claiming earned income for the week ending 1/1/2000. While ten states use the system, only Florida and Kentucky experienced the glitch. Claimants reporting the problem were provided an alternate means for filing their claims according to state contingency plans. A software-based patch was distributed, enabling the resumption of automated earned income processing.	
NA	United States	Minor retail glitches, minor glitches in U.S. Virgin island, minor glitches reported at U.S. Postal Service, Fed other govt agencies and DOD, minor airport glitches reported in several locations. Minor glitch reported at Oak Ridge Nuclear Weapons Plant and at Arkansas NPP	Media, Other, and Government
NA	United States	The Federal Reserve Bank of Chicago reported a Y2K glitch in transferring about \$700,000 in tax payments from customers of 60 financial institutions in the region out of \$15 billion processed nationally that day.	National Co-ordinator
SA	Venezuela	A failure has been detected in one of the major aluminium manufacturing facilities. A temperature monitoring system had been designed to handle only two digits for the year and was not corrected before the roll-over. However, this failure does not represent a major risk for the production process itself. The plant is operating normally in manual mode. This is a customised system designed by third-party vendors just for this plant.	National Co-ordinator
ASIA	Vietnam	Telephone glitches reported in province of Ba Ria	Media
AFR	Zimbabwe	The City of Harare's financial system has failed and contingency plans are being implemented. Clerks at Harare	National Co-ordinator

REGION	COUNTRY	NATURE OF GLITCH	SOURCE
		Municipality were not adequately trained in the use of a new billing system resulting in delays in sending out bills for water and rates. Training sessions were quickly conducted by the supplier and things returned to normal.	
AFR	Zimbabwe	Ruwa, the smallest of towns (about 5,000 residents) reported that a non-compliant server which drives their financial and billing system went down. They have since resorted to manual operations while awaiting new server to be bought.	National Co-ordinator
AFR	Zimbabwe	Central Mechanical Equipment Department (CMED), a small government department's bespoke system crashed. They have gone manual.	National Co-ordinator
ASIA	Japan	Reported the failure of a computer linked to radiation monitoring devices at a nuclear plant, but said it was not considered serious enough to shut the plant.	Media
EUR	France	A weather forecasting map showed the New Year as "19100". A provincial court in South Korea issued automated summonses to 170 people to appear for trial on Jan. 4 th , 1900 instead of Jan. 4 th , 2000.	Media
ASIA	Australia	Ticketing machines on some buses briefly jammed.	Media
US	United States	The Federal Aviation Administration reported momentary problems with printers in transoceanic air traffic control centers in New York, California and Alaska.	Media
US	United States	Seven nuclear power plant facilities around the USA reported minor problems with their computers systems. None of the affected data systems, according to officials, threatened plant safety and all problems have been corrected.	Media
US	United States	One plant in Arkansas experienced a problem with its system affecting access to	Media

REGION	COUNTRY	NATURE OF GLITCH	SOURCE
		the plant's restricted areas. The problem caused no safety hazards and was promptly fixed.	
US	United States	Amtrak's Philadelphia Control Center reported difficulties identifying the trains on its track, but the problem was promptly fixed without disrupting travel.	Media
US	United States	The US Federal Aviation Administration reported minor trouble with a system that distributes weather information to pilots. The glitch affected 16 locations nation-wide but was fixed in about 10 minutes by simply reloading software.	Media
US	United States	A security system recently installed to prevent Y2K problems at one office of the USA Bureau of Alcohol, Tobacco and Firearms failed. Guards were posted while the system was replaced.	Media
US	United States	The most significant Y2K-related glitch came from the Pentagon, where the Defence Department reported early Saturday that one of its satellite-based guidance systems failed to properly adjust to the date change.	Media
ASIA	Australia and New Zealand	Only a minor glitch was reported: some sterilising machines read the date incorrectly. But they continued to sterilise medical equipment properly, and hospital workers manually corrected the date.	Media
EUR	France	The Y2K bug hit several "eyes in the skies". France said one of its defence satellite systems lost the ability to detect equipment failures.	Media

XXVI. ANNEXURE 7

Reported International Y2K Leap-Year Glitches

The International Y2K Co-operation Centre

No Significant Leap Year Computer Problems Reported

1 March 2000 Release

WASHINGTON, D.C. - The Centre created in February 1999 under the auspices of the United Nations with World Bank funding to minimize global Y2K impacts reported no significant computer problems during the leap year date change.

"We did not expect any significant problems with the leap year date and there were none," said Bruce W. McConnell, director of the International Y2K Cooperation Centre (IY2KCC). "Today marks the successful end of our work."

Some had expressed concern that many computers would not recognize 2000 as a leap year and could malfunction. Through six conference calls over two days with national and regional Y2K coordinators from every continent, the IY2KCC monitored the leap year date change. Less than two dozen problems were reported, all of them minor. Problems included incorrect date displays on cellular phones (Morocco), on caller-ID boxes (US), and on airline baggage tags (US); temporary interruptions in service at a few automatic teller machines (Japan) and in transmitting weather data to the media (Netherlands); inability to schedule doctors appointments in a handful of doctors' offices (UK); inability of a few merchants to verify credit card data (New Zealand); and, inability to enter correct expiration dates on new passports (Bulgaria). All problems were corrected within hours.

McConnell said most of the leap year fixes were made as part of earlier Y2K remediation efforts. He cautioned there could still be minor Y2K problems generating quarterly or annual reports, and in systems that are only operated on a contingency or backup basis. "Minor glitches will continue to occur."

Most of them will never become public because they will be fixed by their owners," McConnell predicted.

The Japanese Leap-Year Glitches Were Careless

Tuesday, February 29, 2000-03-09

By Teruaki Ueno

TOKYO (Reuters) – Japan, one of the world's most high-tech nations, Tuesday suffered a series of embarrassing computer problems due to the leap year rollover and was forced to admit it had been careless.

Chief government spokesman Mikio Aoki said the government had let down its guard after the New Year, which it negotiated with only a few millennium bug computer glitches.

"Because everything went well then, there is no denying we were negligent this time", he said.

Playing down the severity of the problems, he said the government would now disband its special leap year task force. It had been set up amid concerns computers would not recognize Feb. 29, 2000, a leap year that occurs once in 400 years.

Wave of Glitches Tarnishes High-Tech Image

The wave of glitches, which hit cash dispensers and weather devices, further tarnished Japan's image as a technological superpower after a recent series of hacker raids on government computers, rocket mishaps and a nuclear accident last year.

The Posts and Telecommunications Ministry said about 1,200 cash dispensers at post offices across Japan went down due to computer bugs triggered by the February 29 leap day.

The ministry said it had sent scores of engineers to repair the dispensers and all the machines had been fixed. The ministry runs some 25,000 cash dispensers.

Japan's Financial Supervisory Agency said there were six reports of computers problems in financial firms, including banks, and all but one had been fixed by late in the day.

The Bank of Japan injected a larger than usual surplus into the money market to try to quell any sudden rise in short-term rates as banks boosted liquidity in case of computer problems.

Weather Bureau Suffers Failure for Second Straight Day

A glitch struck the weather bureau for the second straight day, prompting its computers to send out erroneous information on local temperatures and precipitation.

Japan's Meteorological Agency said computers designed to process the data at its 43 offices across the country malfunctioned early Tuesday. A spokesman said the problem was caused by an old program installed in the system.

All the computers had been repaired, about 14 hours after they started malfunctioning.

Monday, a number of the agency's computers failed to print properly the date on a set of weather forecasts.

Seismic Devices Malfunction in Northern Japan

In northern Japan, the Aomori prefectural government said devices showing seismic activity at 20 local government offices malfunctioned early in the day due to the leap year effect.

Yoshinari Fujita, a millennium expert at Nomura Research Institute, attributed the malfunctions mainly to carelessness.

Officials said they had received no reports of computer failures in any other sectors, including nuclear power generation, aviation and telecommunications.

Japan saw several computer-related glitches at the New Year, including five data monitoring incidents at nuclear power plants, at least one of which was later acknowledged as a Y2K problem after a computer failed to read properly the year 2000.

All were cleared up within hours and did not affect safety or power generation.

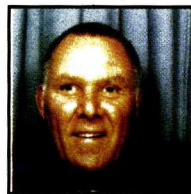
NATIONAL Y2K CO-ORDINATION CENTRE TEAM



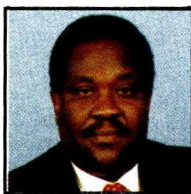
Michael Karanja
 Director-NY2KCC
 Seconded from East Africa Industries Ltd.



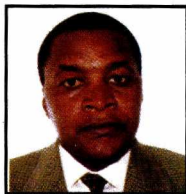
Stephen Gachiengo
 Deputy Director-NY2KCC
 Seconded from the Treasury



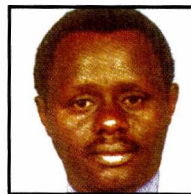
John Smith
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Meshack Ongango
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 Insurance Sector
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Victor Kyalo
 Co-ordinator-Transport &
 Tourism Sector
 Seconded from University of Nairobi



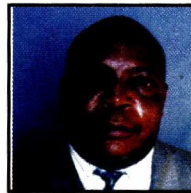
Samuel Ndirangu
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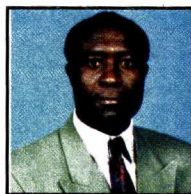
Alan Mordue
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 International Development (DFID)-UK



Charles Nduati
 Co-ordinator-Small & Medium
 Enterprises
 Seconded from DCDM



Joseph Simiyu
 Co-ordinator-Manufacturing
 Sector
 Seconded from KenGen Ltd.



Elijah Mumbo
 Co-ordinator-Government Services
 Seconded from the Treasury



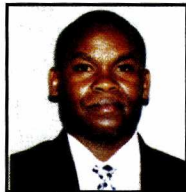
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 Civil Aviation



Mwenda Marete
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Jennifer Muhoro
 Secretary

Susan Marete
 Secretary