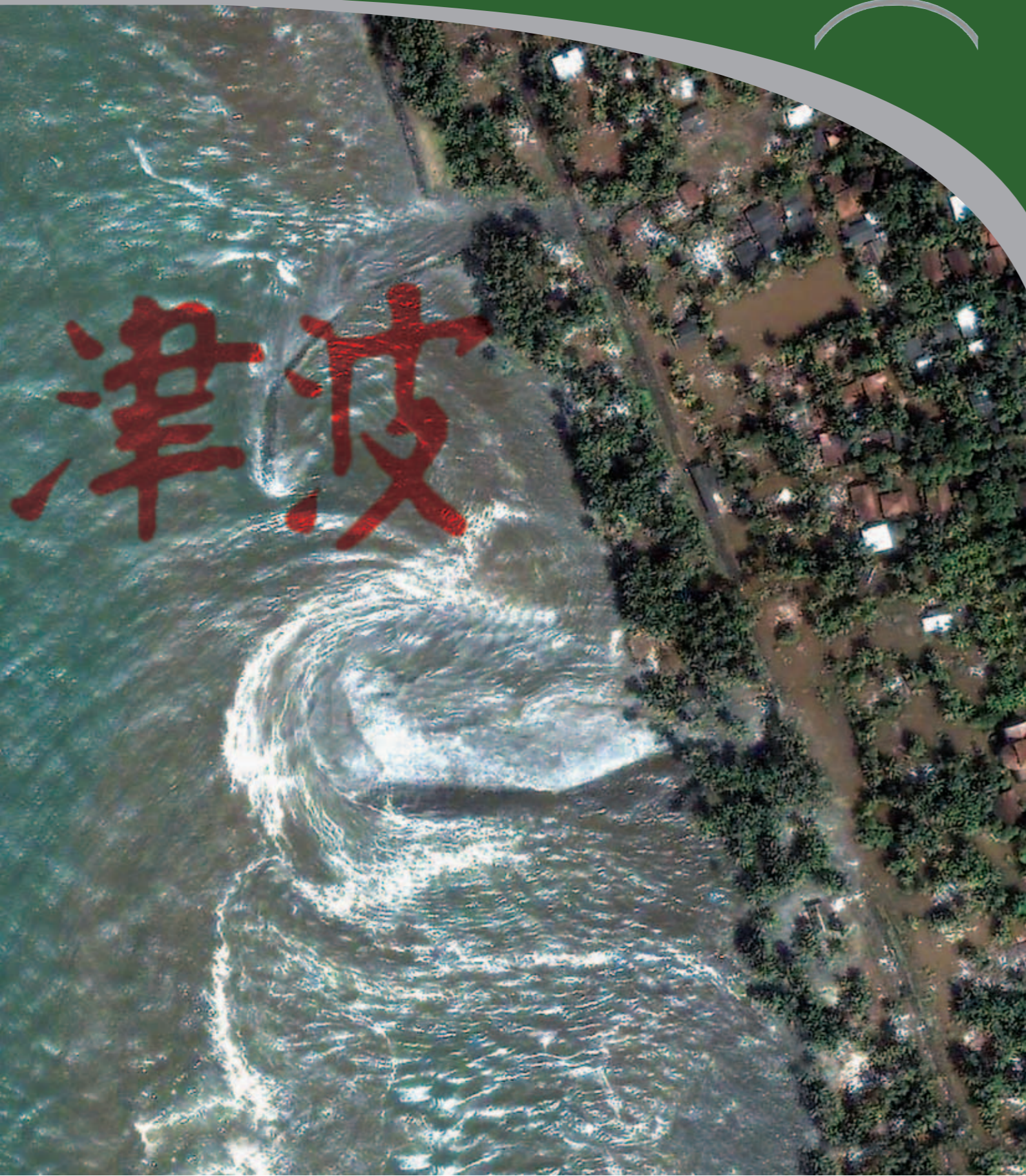


Civil Engineering

Siviele Ingenieurswese

January 2005 Vol 13 No 1

SAISI SAICE



ON THE COVER

Receding waters churning at Kalutara on the south-western coast of Sri Lanka, 26 December 2004. This QuickBird satellite image was collected at 10:20 local time, slightly less than four hours after the 6:28 (local Sri Lanka time) earthquake and shortly after the moment of tsunami impact. Image DigitalGlobe



Civil Engineering
Siviele Ingenieurswese January 2005 Vol 13 No 1

PUBLISHED BY SAICE/SAISI
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ANNUAL SUBSCRIPTION RATE
SA R525,00 (VAT included), International \$110,00

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DESIGN AND REPRODUCTION
Marketing Support Services, Menlo Park, Pretoria

PRINTING
Creda Communications, Johannesburg

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ISSN 1021-2000



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DIARISE THIS!



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 Sources West Coast and Alaska Tsunami
 Warning Center, Wikipedia, DigitalGlobe,
 UNOSAT, National Oceanic and Atmospheric
 Administration, Discovery Channel, USGS, BBC

Tsunami!

'It is as though the world and its people have been for ever damaged and I don't know if we are capable of ever repairing it' – Dr Luci n Skelton, 43, a Cape Town paediatrician doing relief work in Sumatra after the December 2004 Indian Ocean tsunami



Tsunami, in Japanese, means 'harbour wave'. The two characters shown are the two parts of the word, the first being 'tsu', meaning harbour, and the second being 'nami', meaning wave



Top: Banda Aceh: destroyed coastline after tsunami
 Above: Shoreline before tsunami

The magnitude 9,0 earthquake of 26 December 2004 triggered a series of lethal tsunamis that killed more than 160 000 people, making it the most destructive tsunami in recorded history. The tsunami killed people over an area ranging from the immediate vicinity of the quake in Indonesia, Thailand and the northwestern coast of Malaysia to thousands of kilometres away in Bangladesh, India, Sri Lanka, the Maldives, and even as far as Somalia in eastern Africa. Not much remains to be said about this unprecedented global catastrophe, which wrecked the lives of millions – the satellite images speak for themselves. But what are tsunamis and how do they fit in the greater scheme of natural disasters?

THE PHENOMENON WE CALL a tsunami is a series of waves of extremely long wavelength and long period generated in a body of water by an impulsive disturbance that displaces the water. Tsunamis are primarily associated with earthquakes in oceanic and coastal regions. Landslides, volcanic eruptions, nuclear explosions, and even impacts of objects from outer space (such as meteorites, aster-

oids, and comets) can also generate tsunamis. As the tsunami crosses the deep ocean, its length from crest to crest may be a 160 km or more, and its height from crest to trough will only be about a metre. They cannot be felt aboard ships, nor can they be seen from the air in the open ocean. In the deepest oceans, the waves will reach speeds exceeding 970 km/h. When the tsunami enters the

shoaling water of coastlines in its path, the velocity of its waves diminishes and the wave height increases. It is in these shallow waters that a large tsunami can crest to heights exceeding 30 m and strike with devastating force.

The term tsunami was adopted for general use in 1963 by an international scientific conference. Tsunami is a Japanese word represented by two characters: *tsu* (harbour) and *nami* (wave). The term was created by fishermen who returned to port to find the area surrounding the harbour devastated, although they hadn't been aware of any wave in the open water.

Earthquakes generate tsunamis when the sea floor abruptly deforms and displaces the overlying water from its equilibrium position. Waves are formed as the displaced water mass, which acts under the influence of gravity, attempts to regain its equilibrium. The main factor that determines the initial size of a tsunami is the amount of vertical sea floor deformation. This is controlled by the earthquake's magnitude, depth, fault characteristics and coincident slumping of

PAST TSUNAMIS

Although tsunamis occur most frequently in the Pacific Ocean, they are known to occur anywhere. Many ancient descriptions of sudden and catastrophic waves exist, particularly in and around the Mediterranean Sea. A large percentage of world cultures share the legend of a Great Deluge or Flood, which may have been inspired by oral histories of real-life tsunamis.

5000 BC and before

In the North Atlantic Ocean, the Storegga Slide was a major series of sudden underwater land movements over the course of the last 20 000 years, resulting in massive tsunamis covering much of present-day Scotland.

1650 BC

Santorini

At some time between 1650 BC and 1600 BC (still debated), the volcanic Greek island Santorini erupted, causing a 100 m to 150 m high tsunami that devastated the north coast of Crete, 70 km away, and would certainly have eliminated every timber of the Minoan fleet along Crete's northern shore. Santorini is popularly regarded as the most likely source for Plato's literary parable of Atlantis.

1 November 1755

Lisbon, Portugal

Tens of thousands of Portuguese who survived the great 1755 Lisbon

earthquake were killed by a tsunami that followed minutes later. Many townspeople fled to the waterfront, believing the area safe from fires and from falling debris from aftershocks. Before the great wall of water hit the harbour, waters retreated, revealing lost cargo and forgotten shipwrecks.

The earthquake, tsunami, and subsequent fires killed more than a third of Lisbon's pre-quake population of 275 000. Historical records of explorations by Vasco da Gama and Christopher Columbus were lost, countless buildings and libraries and art treasures were destroyed. Europeans of the 18th century struggled to understand the disaster within religious and rational belief systems. Philosophers of the Enlightenment, notably Voltaire, wrote about the event. The philosophical concept of the sublime, as described by philosopher Immanuel Kant in the 'Observations on the Feeling of the Beautiful and Sublime', took inspiration in part from attempts to comprehend the enormity of the Lisbon quake and tsunami.

Many animals sensed danger and fled to higher ground before the water arrived. The Lisbon quake is the first documented case of such a phenomenon in Europe. The phenomenon was also noted in Sri Lanka in the 2004 Boxing Day earthquake. Some scientists speculate that animals may have an ability to

sense subsonic Rayleigh waves from an earthquake minutes or hours before a tsunami strikes shore.

26 August 1883

Krakatoa explosive eruption

The island volcano of Krakatoa in Indonesia exploded with devastating fury in 1883, blowing its underground magma chamber partly empty, so that much overlying land and seabed collapsed into it. A series of large tsunami waves were generated from the explosion, some reaching a height of over 40 m above sea level. Tsunami waves were observed throughout the Indian Ocean, the Pacific Ocean, the American West Coast, South America, and even as far away as the English Channel. On the facing coasts of Java and Sumatra the sea flooded went many kilometres inland and caused such vast loss of life that one area was never resettled but went back to the jungle and is now the Ujung Kulon nature reserve.

22 May 1960

Chilean tsunami

The Great Chilean Earthquake, the largest earthquake ever recorded, off the coast of South Central Chile, generated one of the most destructive tsunamis of the 20th century. It spread across the entire Pacific Ocean, with waves measuring up to 25 m high. When the tsunami hit Onagawa, Japan, almost 22 hours after the quake, a tide gauge recorded a wave height of almost 3 m

above high tide. The number of people killed by the earthquake and subsequent tsunami is estimated to be between 490 and 2 290.

27 March 1964

Good Friday tsunami

After the magnitude 9,2 Good Friday Earthquake, tsunamis struck Alaska, British Columbia, California and coastal Pacific Northwest towns, killing 122 people. The tsunamis were up to 6 m tall and killed 11 people as far away as Crescent City, California.

26 December 2004

Indian Ocean tsunami



Image Wikipedia

Countries most directly affected by the 2004 Indian Ocean earthquake. The epicentre of the quake that caused the tsunami was under the Indian Ocean near the west coast of the Indonesian island of Sumatra. A violent movement of the earth's tectonic plates displaced an enormous amount of water, sending powerful shock waves in every direction. Within hours killer waves radiating from the epicentre slammed into the coastline of 11 Indian Ocean countries, snatching people out to sea, drowning others in their homes or on beaches, and demolishing property from Africa to Thailand.

890 km/h, the speed of a jet airplane. And they can move from one side of the Pacific Ocean to the other side in less than one day.

As a tsunami leaves the deep water of the open sea and propagates into the more shallow waters near the coast, it undergoes a transformation. Since the speed of the tsunami is related to the water depth, as the depth of the water decreases, the speed of the tsunami diminishes. The change of total energy of the tsunami remains constant. Therefore, the speed of the tsunami decreases as it enters shallower water, and the height of the wave grows. Because of this 'shoaling' effect, a tsunami that was imperceptible in deep water may grow to be several feet or more in height.

When a tsunami finally reaches the shore, it may appear as a rapidly rising or falling tide, a series of breaking waves, or even a bore. Tsunamis rarely become great, towering breaking waves. Sometimes the tsunami may break far offshore. Or it may form into a bore: a step-like wave with a steep breaking front. A bore can happen if the tsunami moves from deep water into a

shallow bay or river. The water level on shore can rise many metres. In extreme cases, the water level can rise to more than 15 m for tsunamis of distant origin and over 30 m for tsunami generated near the earthquake's epicentre.

The first wave may not be the largest in the series of waves. One coastal area may see no damaging wave activity while in another area destructive waves can be large and violent. The flooding of an area can extend inland by 300 m or more, covering large expanses of land with water and debris. Flooding tsunami waves tend to carry loose objects and people out to sea when they retreat. Tsunamis may reach a maximum vertical height onshore above sea level, called a run-up height, of 30 m. A notable exception is the landslide-generated tsunami in Lituya Bay, Alaska, in 1958 which produced a 525 m wave.

Since science cannot predict when earthquakes will occur, they cannot determine exactly when a tsunami will be generated. But with the aid of historical records of tsunamis and numerical models, science can



WORST NATURAL DISASTERS

HERE IS A LIST of the worst natural disasters in recorded history.

Currently, the 2004 South Asia tsunamis would have the highest fatality count for a tsunami event, surpassing a tsunami in 1896 that killed 27 000 people in Japan.

2004 – South Asia

An earthquake causes tsunamis that hit Sri Lanka, Indonesia, India, Thailand and other South Asian nations. The death toll stands at more than 160 000 and is expected to rise

2003 – Iran

A 6,3 quake devastates the city of Bam, killing more than 50 000 people

1999 – Venezuela

The death toll is still unclear from the rain-caused landslides that hit Venezuela in mid-December 1999; official estimates are as high as 30 000 deaths

1998 – Central America

Hurricane Mitch devastates much of Honduras and Nicaragua in Central America. More than 10 000 people are killed and some two million left homeless as mudslides sweep away whole villages

1991 – Bangladesh

Bangladesh lose more than 130 000 people in April 1991 from cyclone-induced flooding

1990 – Iran

An earthquake triggers a landslide, causing from 40 000 to 50 000 deaths in western Iran on 20 June

1988 – Armenia

An earthquake measuring 6,9 on the Richter scale devastates Armenia, killing over 100 000 people

1985 – Colombia

A small eruption of the Nevado del Ruiz volcano in Colombia on 13 November leads to a massive mud-flow that covers the city of Armero and kills more than 23 000 people

1983 – Thailand

Monsoons kill 10 000 people in Thailand in the course of three months. Some 100 000 people contract waterborne diseases as a result of the storm

1976 – China

A deadly 8,0 magnitude earthquake strikes Tianjin, China, on 27 July. The official casualty figure issued by the Chinese government is 255 000

1970 – Bangladesh

Bangladesh loses more than 300 000 people in November from cyclone-induced flooding

1970 – Peru

A 7,8 magnitude earthquake at Mount Huascaran, Peru, on 21 May causes a rock and snow avalanche that buried two towns, killing as many as 20 000 people

1959 – China

In July, massive floods in China kill at least two million people

1938 and 1939 – China

Floods kill one million people in a two-year period in China

1931 – China

The massive flooding of the Yangtze River in China in 1931 causes more than three million deaths from flooding and starvation

1902 – Martinique

The eruption of Mont Pelée in Martinique, Lesser Antilles, in 1902, kills nearly 30 000 people

1896 – Japan

About 27 000 people drown following an earthquake-induced tsunami off the coast of Japan

1887 – China

About 900 000 people die when the Yellow River burst its banks in the worst-ever recorded flooding

1883 – Indonesia

On August 26, Krakatoa, a small volcano on an uninhabited island between Sumatra and Java, explodes. The eruption and a tsunami kill 36 000 people in this Indonesian region

1815 – Indonesia

A volcanic eruption of Mount Tambora on Indonesia's Sumbawa island kills more than 90 000 people

1780 – Caribbean

'The Great Hurricane' hits the Caribbean in October and kills 22 000 people on the islands of Martinique, St Eustatius, and Barbados

1556 – China

A quake hits the Chinese province of Shansi on 2 February, killing 830 000 people

1201 – Mediterranean

The deadliest earthquake in recorded history kills approximately 1,1 million people in Egypt and Syria

PROFILE

Guiding young engineers to professional maturity

'Traditionally, contractors do not play the role that they should in institutional and professional affairs. They are largely conspicuous by their absence in this arena,' remarks incoming SAICE president for 2005, Mike Deeks. Being a seasoned contracting man himself – he's been with the Murray & Roberts Group of companies for the past 24 years – Mike is well placed to take the contracting fraternity to task about what he perceives to be a lack of payback to the profession. In trying to put her finger on what makes Mike tick, Lorraine Fourie finds a man who also feels that the 'grandfather figures' of civil engineering should play a stronger role in guiding young engineers to professional maturity



SAICE president for 2005, Mike Deeks

'I BELIEVE a mark of winning organisations these days is that their executives are seen to be playing a strong vocational and professional role in the industry that they operate in,' says Mike. 'It is for that reason that, at Murray & Roberts, we encourage our people who have the necessary qualifications to register professionally and to play a role in vocational societies and industry fora.'

In this regard Mike has been leading by example for several years now. His active participation in various SAICE portfolios – inter alia the local Witwatersrand Branch, the Engineering & Training, Membership and Professional Relations committees, and especially as Vice President: Professional Development since 2001 – led to Mike being asked to join ECSA's Civil Professional Advisory Committee (PAC) in 1995. He has been chairman of this committee since 2002. He also represents ECSA on the CIDB's (Construction Industry Development Board) Stakeholder Forum and other forums.

'As a formally constituted committee of ECSA, the PAC Civils is charged with the process of registering professional engineers in the civil discipline,' he explains. 'It's been a very rewarding experience for me to have played a role in changing the whole registration process for young engineers during the time that I have been involved. What I find very gratifying is that many of these new engineers are approaching their profession with the right attitude. They have what it takes to deliver the kind of infrastructure that South Africa needs. My personal perception from my interaction with them is that, these days, students who go into engineering are more likely to do so because they want to improve the lot of their fellow men.

They want to deliver basic services to the millions of people who don't have any services. That might be totally different from the reasons why I went into civil engineering, which was to build grandiose projects,' he grins.

SHAPING HIS LIFE

Born in Durban and growing up in the picturesque area of Kloof, KwaZulu-Natal, Mike received much of his schooling at the local Thomas More College, a church school. It was only in Grade 11 (then Standard 9) that he moved to Cape Town and was sent to SACS (SA College School), where he matriculated first class in 1968, obtaining distinctions in Maths, Latin and Geography.

Winning a scholarship from SACS as well as a Morris Ruskin bursary, he went on to study for a BSc degree in civil engineering at the University of Cape Town. 'I guess that if you're strong in maths and science, you naturally steer towards doing engineering,' he says. 'Also, in my matric year I attended the SAFUES engineering winter school at UCT, held for kids from schools in the Cape area. We were taken around various engineering sites and introduced to all branches and concepts of engineering, and that really reinforced my interest in the field.'

The young student also had a healthy interest in the South African socio-political scene of the early seventies. Having grown up in a home environment where issues of the day were questioned and debated at supper table, Mike was concerned about the erosion of law at the time. 'I wasn't actively involved in student politics, but I did join the protests being registered by the student body at the time. Because of my interest in

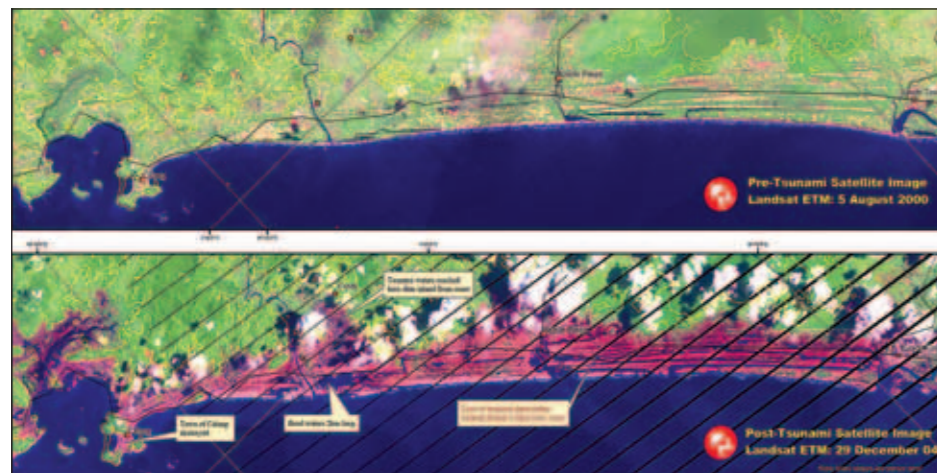
this area, I chose, as part of my engineering course, to do complementary studies in Comparative African Government and Law in the Arts faculty. I found it fascinating at the time to be exposed to such concepts outside engineering, and was allowed access to the Senate Collection of works in the library, many of which were banned publications and therefore not accessible to most other students.'

After graduating in 1975, Mike joined the Cape Town City Engineer's Department in the Waterworks Branch, where he was responsible for hydraulic and structural design, control of departmental construction units and contractors, and the calculation of flood hydrographs.

Assigned to the Riviersonderend/Berg/Eerste River Augmentation Scheme, initially as assistant resident engineer and later as resident engineer, Mike was involved in the construction of large-diameter steel and prestressed concrete high-pressure pipelines in the Franschoek-Wemmershoek-Stellenbosch area, designed to bring water to the Cape Town metropolitan area.

'The route that was followed required laying pipelines through some of South Africa's most prestigious wineland areas – through Spier, Jacobsdal, and so forth – and I was quite involved in negotiating crop compensation claims with farmers – not always the easiest job for a young engineer straight out of university,' Mike recalls.

On completion of the project, Mike found that his department's medium-term plans offered little of challenge to him. So he successfully responded to an advertisement by what was then Gillis-Mason Construction, who were finishing their first very



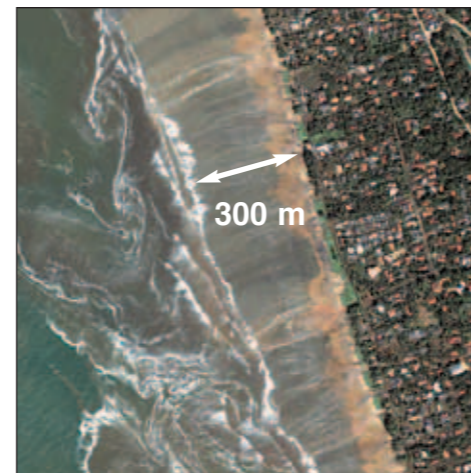
This map illustrates the extent of the tsunami destruction along the western coast of Sumatra with a Landsat ETM image taken 29 December 2004

get an idea as to where they are most likely to be generated. Past tsunami height measurements and computer modelling help to forecast future tsunami impact and flooding limits at specific coastal areas – but as we have seen, these are not infallible ...

HUMANITARIAN AID NEEDED AFTER 2004 TSUNAMI

A great deal of humanitarian aid is needed owing to widespread damage of the infras-

structure, shortages of food and water, and economic damage. The World Health Organisation (WHO) has warned that if basic needs are not urgently restored to all populations, outbreaks of infectious disease could result in a similar number of fatalities as occurred due to the direct impact of the tsunami. Epidemics are of special concern, as they are likely because of the high population density and tropical climate of the affected areas.



Waters receding at Kalutara, Sri Lanka

The overwhelming concern of humanitarian and government agencies is to provide sanitation facilities and fresh drinking water to contain the spread of diseases such as cholera, diphtheria, dysentery and typhoid. Officials estimate that billions of dollars will be needed. Included with this issue of *Civil Engineering* is a fact sheet detailing SAICE's involvement in the relief effort. □

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large power station project for Eskom and were hopeful of a second similar-sized award. Being appointed Manager: Project Services, he left Cape Town for Johannesburg in 1981. 'I came up to do the wrap-up of the final account for Matla power station, which led into design and commercial co-ordination for the subsequent projects for Lethabo and Kendal power stations. It was a period of incredible activity for the industry – we secured work that doubled the size of the company in just a couple of years. And I think we're about to go into a similar period right now,' he concludes on an upbeat note.

In the mid-80s Murray & Roberts bought a controlling interest in Gillis-Mason, which by 1987 had become a wholly owned subsidiary. 'That marks the beginning of my involvement with Murray & Roberts, where I've been ever since, though in varying capacities,' says Mike.

Apart from doing project co-ordination during the years 1981 to 1996, he worked on pre-qualification bids and major construction tenders for local projects, as well as carrying out forecasts of cash flow and escalation and providing commercial support to projects. He was responsible too for the identification of new business opportunities, both domestic and international, and his natural communication skills, honed on intransigent wine farmers, served him well in his growing interaction with clients, professionals and local authorities. A highlight was representing Murray & Roberts in an international consortium bidding for casino licences in Mpumalanga and Northern Province in terms of new government legislation.

The foundation was also laid for his growing involvement in training and human relations. He became a professional mentor for engineers in training and postgraduates, and administered the company's bursary scheme and technician training scheme. He also helped steer the company through a process of participative management.

By mid-1996 Mike was looking for new challenges outside of construction and transferred for a short period to group company LAMA International Contractors, where he filled the position of proposals manager, pursuing opportunities in South Africa's first major public-private partnership concession for water and wastewater, for the Greater Nelspruit area. In addition to becoming involved in all aspects of the bid, Mike found himself over weekends addressing stakeholders in the local townships, trying to drum up grassroots support for their offer. 'I found communicating with the community leadership on the ground very rewarding, even if quite demanding. I have followed the fate of this project with great interest and some sadness over the years and it would seem that Murray & Roberts and our partners were quite fortunate not to have won the concession at the time.'

In 1997 Mike moved again within the Group to Engineering Management Services (EMS), spending his first day of employment en route to Kuala Lumpur to assist in the preparation of a lump sum tender for the Malaysian Formula 1 race track. After his return a month later he was made responsible for project services, including estimating, procurement, project controls and commercial.

'EMS had started transforming from its traditional role as merely a provider of engineering and project management services on a man-hours reimbursable basis to an international turnkey contractor,' Mike continues. 'This transformation to an implementer of projects required us to be skilled "deal makers", understanding more fully and managing properly the risks associated with our new role.'

Against this backdrop, Mike undertook assignments to the United Arab Emirates, Oman and the Philippines to provide commercial support and oversee the preparation of other major turnkey tenders for industrial plants. He also undertook a whirlwind marketing trip at the invitation of an international resources company to Cuba, 'a country that needs to be seen and experienced to be believed', says Mike, who can't wait to return to the bodegas, music and cigars of Havana for a more relaxed visit!

Upon the amalgamation of EMS with LAMA and newly acquired JCI Projects, the new company of Murray & Roberts Engineering Solutions was formed to implement projects across a wide range of industry sectors.

Lump-sum turnkey and service package tenders for large projects such as the Mozal expansions and others in Mozambique, Ethiopia, Kenya, Tanzania and the Democratic Republic of Congo have also provided the variety of challenges that Mike thrives on.

'At the moment we are involved in a major expansion for Mondi in Richards Bay which is worth over R3 billion. We also put in a massive amount of work to prepare our bid for the Gautrain project in 2003, in consortium with leading international and local partners. We are now in the process of submitting our revised bid for the project – what they call the BAFO, the best and final offer. This BAFO has to take into account further value-for-money considerations that the client, the Gauteng Transport Department, has asked us to incorporate. So this is going to be a further challenge, although I don't expect that we'll again be producing a ton and a half of paper as we did in the first round,' he grimaces.

MAINTAINING A BALANCE

Mike revels in the particular demands of his deadline-driven job and teamwork generally. 'I'm more interested in the interaction within teams and between people, which I think are just as important as individual technical or other achievement. However, one of the

goals that I have for 2005 is to make sure that I maintain a better balance between my professional and employment-related duties and still have time for myself and my wonderful family too.'

Mike and his wife, Michèle, will be writing matric again this year because their youngest daughter, Sarah, is in her final year at school. 'I must be cognisant of this when I take on responsibilities,' he says with obvious concern. Their second daughter, Claire (23), works in the telecoms industry, and their two sons, Matthew (29), and Chris (32), both of whom are married, are in IT and media respectively.

Then there's the apple of Mike's eye, his three-year-old grandson Daniel. 'I was teased the other day that I'm probably the first SAICE president in a long time, if not ever, who's a grandfather. I'm just so grateful that Daniel's family is living in South Africa so that we can enjoy spending time with a grandchild who lives close to us.'

Mike and his family have always been a very close-knit unit. They enjoy hiking together and recently he and Michèle hiked the Fish River in Namibia. Mike also did a four-day hike with a difference last year. 'It was quite tough doing the Heritage Walk, which is about 115 km over rough terrain, some of it really bundu-bashing, between the Pilanesberg and Madikwe Game Reserves.'

You will also find Mike and Michèle among the early-morning Bryanston joggers. 'Running used to be very much part of my life from my UCT days,' he says. 'As a child, in Kloof, I grew up on the Comrades route and dreamt of the day that I would be old enough to take part.' He has since run 12 Comrades and 13 Two Oceans ultra-marathons, but does not attempt anything longer than a half marathon these days.

For Mike, his leisure-time pursuits – which also include 4x4 adventures into Africa's wilderness, birding and wildlife – constitute time to reinforce his spiritual connections. 'That facet of my life is very important to me.'

Having made a spiritual ethos the backbone of his life, it is small wonder that his value system is altogether non-materialistic. As his two biggest assets he cites, first, not being afraid to speak his mind. 'It might not always be the greatest thing for anyone's career at the time, but I will say what I think needs to be said.' And, second, his faith in people. 'My interaction with people, especially young graduates, has impressed on me the quality of the young professionals that we have here in South Africa. We need to give them the best guidance possible to keep them on our shores and in our industry,' he concludes.

As SAICE's president for 2005 Mike will be intensifying the Institution's efforts to develop engineers who will suit the needs of the country. □



An introduction to adjudication

Adhering to the procedural requirements for declaring, conducting and settlement of disputes will require some level of skill and specialisation to effectively protect a party's rights under the contract

IN THE GOVERNMENT white paper on creating an environment for reconstruction growth and development in the construction industry in 1999, it was argued that the conventional mechanisms and procedures for final dispute resolution (normally arbitration or litigation) are too costly and time consuming.

In March 2001 government published a draft code of practice entitled 'Adjudication in Engineering and Construction Contracts in South Africa', proposing a move towards rapid and inexpensive dispute resolution mechanisms in said contracts.

The Construction Industry Development Board (CIDB) issued a draft practice guide for public comment in August 2003. This practice guide, published on the back of the white paper, also advocates the use of adjudication as a cost and time efficient alternative dispute resolution mechanism to arbitration and litigation.

The World Bank also advocates that adjudication procedures be used on projects which it funds.

The Principal Building Agreement of the Joint Building Contracts Committee (JBCC), published in March 2004, incorporated adjudication into the local construction industry even further.

ADJUDICATION – THE GENERAL PRINCIPLES

While adjudication is at present being introduced locally, many members of the construction industry remain unclear as to what adjudication is and how it is applied.

Although the terms of adjudication are contract specific, adjudication can, in broad terms, be defined as being 'an accelerated and cost effective form of dispute resolution. The outcome is a decision by a third party intermediary which is final and binding on the parties in dispute, unless the decision is reviewed by litigation and arbitration.'

PROCESS AND PRINCIPLES

Any dispute arising from, or in connection with, the contract should be capable of being referred to adjudication provided that the necessary terms are incorporated in the contract at the appropriate time. While the procedural requirements for referral of disputes and conducting the adjudication will vary from contract to contract, one is able to distinguish certain underlying principles:

- A party referring a dispute to adjudication must do so in writing and must submit all necessary information, and submit the dispute within the time period stated in the contract, failing which it forfeits the right to dispute the matter.
- The terms and procedures of adjudication are agreed and detailed in the contract, which results in an informed, transparent and speedy decision. If successfully referred, each party must be given a reasonable opportunity to state their case (without a hearing), to know what the case against it is and also to be placed in possession of all evidence obtained by the adjudicator.
- Adjudicated disputes must be resolved within the contract period as the contract itself forms the basis for enforcing the decision of the adjudicator. As a general rule, all disputes are to be resolved within a 42-day period of being referred to adjudication.
- The role of an adjudicator is not that of an arbitrator. The adjudicator is tasked with settlement of the dispute within the contractual rights and obligations between the parties.
- Adjudicators must base their decisions on the subject of the dispute at hand only and must avoid conducting hearings to resolve disputes. Adjudicators should avoid individual contact with either party and may not discuss matters with a party without informing the other party of the discussion and the outcome thereof.

■ It is essential to successful adjudication that adjudicators achieve a balance between an inquisitorial approach and adherence to the rules of natural justice in order to treat the parties fairly. For instance, an adjudicator may not prepare his own critical path analysis and draw any conclusions from it without affording the parties an opportunity of making submissions on the accuracy thereof.

- Adjudicators must answer all questions put to them and are normally required to provide written reasons for their decisions.
- It goes without saying that adjudication can only succeed if the adjudicator is impartial and does not have (or appear to have) any relationship with any of the parties, nor have an interest in the outcome of the adjudication.
- The adjudicator should also have the right, after notifying the parties, to refer to legal and technical experts for assistance in areas where the adjudicator recognises the he may not be adequately equipped. This provision is aimed at ensuring that justice is served, despite the fact that the adjudicator may not personally possess all the skills necessary to resolve a matter.
- The decision of the adjudicator is final and binding on the parties, unless it is reviewed by either arbitration or litigation. The decision becomes enforceable immediately, whether the dispute is to be referred for final resolution or not.
- Final resolution of the dispute may, in some instances, only be referred to arbitration or litigation after a 'cooling down' period has elapsed allowing the parties to make this decision after careful consideration of the merits of their case.

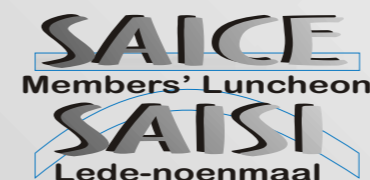
CAN ADJUDICATION WORK?

Can adjudication work? One can only form a view on this with due regard of other jurisdictions where adjudication had been intro-



ATTENTION SAICE CORPORATE MEMBERS! CONSTITUTIONAL BALLOT

SAICE corporate members with e-mail addresses will be receiving a secret ballot paper via e-mail. Ballot papers will be posted with annual membership invoices to corporate members without e-mail addresses. Please note that the ballot will be closing on 31 January 2005.



When: 4 February 2005
Time: 11:30 for 12:00
Where: Country Club Johannesburg (Auckland Park)
Dress: Smart casual / traditional
Cost: R200.00 pp (including VAT)

The programme includes the inauguration of the SAICE president for 2005, Mr Mike Deeks, the presentation of his presidential address, as well as the launch of SAICE's "Foundation for the Future - Civil Engineering in South Africa" coffee-table book.

Visit our website on:
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Standard Bank Parktown
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Cancellation of bookings after 2 February will have to be paid in full

BOOKING FORM - BESPREKINGSVORM

Name / Naam: _____

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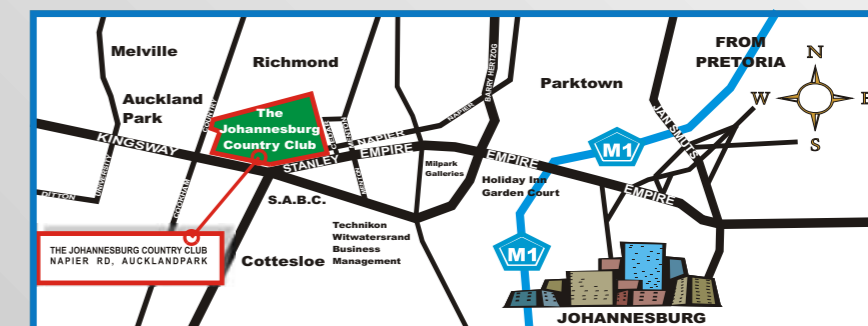
Address / Adres: _____

Number of guests: _____ Guest names: _____
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Special menu requirements: _____
Spesiale spyskaartvoorkeure: _____

Amount due: _____ Signature _____
Bedrag betaalbaar: _____ Handtekening: _____

RSVP: Zina Giraldo before 28 January: zgiraldo@saice.org.za fax no.: 011 805 5971
Private Bag X200, Halfway House, 1685



duced, tried and tested.

In the United Kingdom, adjudication became mandatory on all prime contracts and sub-contracts in 1998, through the introduction of the Housing Grants Construction Regeneration Act (1996). From the following statistics (based on some 4 850 adjudications up to September 2001) it is clear that adjudication can provide a quick summary procedure for resolving disputes:

- 74 % of disputes referred resulted in a decision, the balance being settled or abandoned
- 76 % of referrals were completed in less than 40 hours
- 73 % of disputes concerned non-payment; other significant issues were variations, loss/expense and points of law
- 81 % of adjudications involved a referral by a party lower in the construction chain
- almost 50 % of all referrals were by sub-contractors against main contractors
- 68 % of decisions were in favour of the referring party

There can thus be little doubt that adjudication has had a marked influence on the construction industry in the United Kingdom.

The high percentage of adjudications relating to 'non-payment' issues does seem to indicate that where disputes are more complex, such as negligent design or construction, and are likely to affect further contracts (such as insurance policies), parties may be more reluctant to resolve matters through adjudication.

A further point of concern is the immediate enforceability of decisions. A party facing an adverse award may for instance be obliged to make payment to a party in severe financial difficulty. Should the decision of the adjudicator then be determined as incorrect by a later forum, the party at the wrong end of the adjudicator's decision then runs the risk that the recovery of monies paid may no longer be possible.

ADJUDICATION IN THE FUTURE

It is clear that adjudication can, and proba-

bly will, play a major role in the local construction industry as an additional alternative dispute resolution mechanism. A good working knowledge of processes, procedures and pitfalls under the various standard forms of construction contracts will be a prerequisite in future negotiations of contracts.

Adhering to the procedural requirements for declaring, conducting and settlement of disputes will require some level of skill and specialisation to effectively protect a party's rights under the contract.

The procedural and specific requirements of a number of the standard construction agreements, such as FIDIC, BIFSA, JBCC and NEC, will form the subject matter of a series of future articles.

The Construction and Engineering Law Division of Deneys Reitz Attorneys has the expertise to assist clients involved in disputes where adjudication is the selected dispute resolution mechanism. Deneys Reitz Inc 011-685-8876

Counting the costs of RED TAPE for business in South Africa

REGULATORY COMPLIANCE, or 'red tape', cost South African business R79 billion in 2004 – an amount equivalent to 6,5 % of the gross domestic product (GDP).

This is one of the key findings to emerge from a major survey of some 1 800 large, small and medium enterprises in South Africa. Developed and commissioned by the Small Business Project (SBP), an independent private sector development and research organisation promoting strategic partnerships and a better environment for business growth in Africa, the survey provides the first hard data on the costs of

regulatory compliance in South Africa.

It is also probably the largest and most wide-ranging survey of its kind ever conducted in the world. The survey covered all parts of the economy including manufacturing, mining, construction, trade, agri-business and services.

SOME KEY FINDINGS

- Total cost to business of complying with regulations was R79 billion in 2004.
- Thirty four per cent of businesses believe that regulations and other interactions with the state inhibit

business growth.

- Twenty per cent of employers say that labour law and general government regulations constrain increased employment.
- Businesses report that the most troublesome and time-consuming regulations are VAT, other aspects of tax administration, labour laws, SETA and RSC levies, in that order.
- Seventy six per cent of respondents say that compliance costs have increased in the past two years.
- Large firms pay the most in absolute terms, but regulatory compli-

ance costs weigh more heavily on smaller enterprises: compliance costs represent 8,3 % of turnover for firms with sales of less than R1 million a year, and 0,2 % of turnover for corporations that turnover R1 billion or more a year.

■ The impact of red tape is greatest in transport, services and tourism and least in retailing and wholesaling.

The SBP survey looks in detail at two kinds of regulatory costs faced by the private sector – efficiency costs and compliance costs.

■ Efficiency costs occur when regulations distort the market, such as

when inappropriate labour market legislation affects employment and output, or when a business decides to limit sales in order to stay below the VAT threshold.

- Compliance costs are purely the costs of red tape: that is, they are the incremental costs incurred by business in complying with regulations. They include the value of time spent by business managers and staff on understanding the rules and applying them, interacting with the authorities to clarify matters arising, and the payments made for the expertise of profes-

sional advisers, such as consultants, lawyers and accountants. For instance, the costs of tax paperwork are compliance costs, while the tax payments themselves are not. Capital costs of compliance, such as those for water effluent or smokestack equipment, were excluded from the study.

- For informal sector enterprises only, questions were also asked about the costs arising from harassment by police and others, and from bribes. These were termed the costs of non-compliance.

NEGATIVE IMPACT

'Excessive red tape negatively impacts on employment and growth,' says SBP executive director Chris Darroll.

'What's clear is that the private sector devotes considerable resources to administering red tape and that the cost burden weighs more heavily on the small business sector. Red tape affects certain sectors, like the key growth sector of tourism, more than others.

'It is obvious that many regulations are necessary, such as occupational health and safety rules, but even among necessary regulations, there are many that have become unnecessarily expensive to comply with. There are also likely to be many other regulations where the costs exceed the benefits and some

which have no benefits at all.

'By working towards a more appropriate and efficient regulatory framework for South Africa we can significantly increase the country's economic growth prospects,' says Darroll.

A hidden cost in a regulatory environment is the cost to government of administering regulations. Evidence from the UK suggests this could be 20 % of the cost of red tape to the private sector.

'If the same could be said to apply to South Africa, then government could be spending as much as R16 billion on administering the regulatory environment. Reducing costs in government could also free up funds for more worthy social programmes,' concludes Darroll.

SALIENT FINDINGS FROM THE SURVEY

Business perceptions about constraints to growth and regulatory costs

The first question asked of respondents to the survey was: 'What factors of any kind prevent or discourage a business like yours from expanding its operations?' The results are presented in figure 1.

A wide range of factors is perceived to limit growth. Of the constraints mentioned, two stand out: weakness in the economy or lack of demand, and a range of factors resulting from the state's interface with business. These two factors are ahead by some way of the third and fourth, labour problems and affordable access to capital.

Figure 2 breaks down the growth-inhibiting factors that arise at the state interface. It can be seen that these are largely perceived by respondents as entailing efficiency costs, except for the single largest category, which is the pure red tape of regulatory compliance. Regulatory compliance costs are followed by BEE issues (which have yet to make their full effect felt). Labour and taxation issues are also significant.

Detailed analysis of the responses by sector shows that, relatively speaking, the impact of state-induced constraints is greatest in transport, services and tourism (arguably the single most important growth sector) and least in retailing and wholesaling. Manufacturing, also a key growth sector, emerges as slightly above average in terms of constraints originating at the state interface. These constraints are, in the perception of respondents, greatest for the largest enterprises and least for micro-enterprises.

Again, lack of confidence or demand in the economy attracted the most mentions, followed by labour laws and government regulations in general. Some of the other

factors, such as hiring and firing difficulties, employment equity and various employment related costs are heavily influenced by government actions. The responses generally give the impression that regulatory costs – of both the efficiency and compliance varieties – are an important reason why South African businesses are reluctant to hire more staff.

THE REGULATORY FRAMEWORK

It is stated in the survey that the full scope of the regulatory system that gives rise to these costs is probably not familiar to most readers. In fact, since there is no comprehensive database of regulations in South Africa, it is unlikely that anyone actually knows how many regulations there are or how they have changed over time. Although regulatory powers and responsibilities are conferred by legislation, the detailed interpretation of these powers into specific rules and requirements takes the form of ministerial orders, departmental guidance notes, and other instruments issued by central, provincial and local governments and their agencies. These are nowhere collated together.

Brief review of cross-cutting regulatory requirements

These are the most important regulations that affect most formal businesses. However, this is not a complete list of all general regulations. In addition, almost every sector of the economy has regulations that are specific to its type of operations.

General start-up: nine registration requirements, five different offices

- Reserve a company name
- Register name and articles of association
- Register for VAT; Skills Levy indicating the relevant SETA; PAYE; Income Tax

- Register with Unemployment Insurance Fund; Regional Services Council
- Register as Employer for Workman's Compensation

People and workplace

- Industrial Relations Act
- Basic Conditions of Employment Act
- Occupational Health & Safety
- Compensation for Occupational Injuries and Diseases Act
- HIV/Aids and Employer
- Skills Development Act & Levy
- Unemployment Insurance Act
- Employment Equity Act
- Broad Based Black Economic Empowerment Act

Taxation

- Standard Income Tax on Employees (SITE)
- Income Tax
- Secondary Tax on Companies
- PAYE
- Provisional Tax
- Capital Gains Tax
- Value Added Tax
- Regional Services Council Levy

Miscellaneous

- License Fees
- Stamp Duties Act
- Price Controls
- Competition Act
- Consumer Affairs Act
- Promotion of Access to Information Act
- Trade Marks, Registered Design, Patents, Merchandise Marks, Copyright
- Environmental Policy and Legislation
- National Environmental Management Act (Environment Conservation Act, Atmospheric Pollution Prevention Act, National Water Act)
- Tourism levies and requirements

Customs & Excise

Right from the beginning, a new enterprise with turnover in excess of the VAT threshold (R300 000) will have nine separate registration requirements requiring contact with five different central government offices. Thereafter the business will face a large number of other requirements, examples of which are given above. These cross-cutting measures affect businesses of every kind. In addition, almost every sector of the economy has regulations that are specific to its type of operations. Examples of these sector specific regulations are labelling requirements for foods and pharmaceuticals, construction and use regulations affecting motor vehicles, and prudential regulations for banks and other regulation of savings products. Businesses may also be required to comply with provincial and municipal regulations affecting, for example, zoning, signage, licensing and local rates and taxes.

Businesses have to spend time in learning what regulations apply to them, in complying with these regulations, and in keeping up to date with changes. Larger firms in particular need to comment on proposed and current legislation and regulations, as part of the process of consultation with government. Many businesses are also obliged to spend time collecting information, often highly detailed, to respond to compulsory questionnaires from Statistics South Africa.

Regulatory costs clearly impact disproportionately on small firms. Average compliance costs per person employed for firms with fewer than five employees are ten times higher than for a firm with 200 to 499 employees.

Figure 1

Note: Percentage exceeds 100 because many respondents gave more than one response

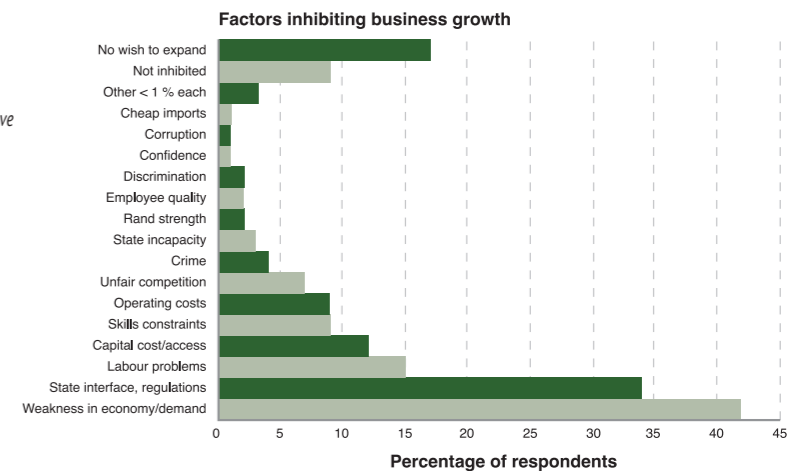
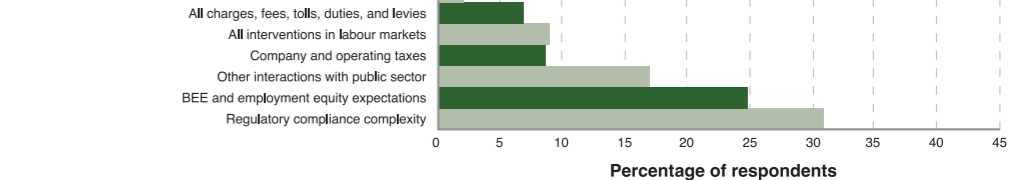


Figure 2

Costs of registrations, compulsory affiliations, licences, insurance, etc



CONCLUSIONS

The report concluded that it is clear that the aggregate of resources spent by formal business in South Africa on regulatory compliance is now very large. These costs represent real resources that have alternative uses. Businesses could employ the resources now used in complying with regulation for innovation and expansion, or in improving their local and international competitiveness. The government could use some of the cost savings (and some of the income generated by the private sector in the rounds of production and spending stimulated by these savings) to improve public services or to reduce taxation.

Moreover, countries that reduce their regulatory compliance costs increase their attractiveness to foreign direct investment.

Reducing the compliance costs of regulation does not pose the same kinds of political challenges or require the same kind of socio-political trade-offs as would reducing their efficiency costs. Simplifying procedures, making forms available on-line and rationalising multiple requests for information or for proof of tax compliance could all make a significant difference to compliance costs without raising the hackles of any important interest group. ■



Can the civil engineering sector learn a *trick or two* from manufacturing?

'It is possible that this approach could signal a new way of looking at these critical services. Helping to unlock the magic formula of cutting costs without losing quality' ...

IN THE LAST 50 YEARS, the manufacturing sector has earned a reputation for quality and efficiency that is the envy of many other industries. A large part of its success is due to its use of efficient production systems developed in Japan after World War II and used and perfected by businesses the world over.

Collectively termed 'Lean systems', these methods have helped make businesses such as Toyota great by enabling them to reduce costs while simultaneously increasing quality.

In the early eighties, these systems attracted the attention of researchers in production and operations management and numerous studies have been undertaken to unearth their potential.

The most comprehensive of these studies was the five-year five-million-dollar future of the automobile study conducted by the Massachusetts Institute of Technology. In 1990, Jim Womack, now head of the US-based Lean Enterprise Institute, published the results of this study in a book titled *The machine that changed the world*. The book became an international bestseller and a widely publicised Lean production.

In its editorial review of the book, the *New York Times Magazine* stated that: 'The fundamentals of this system are applicable to every industry across the globe ... [and] will have a profound effect on human society – it will truly change the world.'

According to *Technology Century* (Volume 10/2001), compared to conventional manufacturing principles, products manufactured using Lean principles have required significantly less resources to produce and have resulted in the following:

- There were productivity gains of 300–400 %.
- Labour productivity increased an average of 25 % a year.
- Defect rates reduced from more than 2 000 to less than 50 parts per million (PPM) and in many to less than 10 PPM.
- Cost of quality was cut by more than 60 %.
- Work-in-process inventory was slashed by more than 80 %.
- Revenue per 1 000 square feet of factory space was raised by 350 %.

While these figures illustrate the practical value Lean operations offer, a posting by Norman Bodek in June 2004 on the US

based Northwest Lean group website (www.NWLEAN.net) captures the essence of Lean thinking.

Bodek is considered the godfather of the Lean movement outside Japan. He translated and published the writings of Taiichi Ohno, Shigeo Shingo, Seiichi Nakajima, and others who were the architects behind the Toyota Production System.

He writes: 'Lean is fundamentally empowering all workers to be partners in your continuous improvement efforts. You ask them to make their work easier and more interesting. You challenge them to grow every day on the job. You ask them to cut costs, to improve safety, to improve quality and reduce the time line to deliver superior products and services to their customers. And you listen, listen, listen and learn from them. Of course, we focus on the wastes but we allow everyone to participate.'

Bodek says that there are two barriers to advancing Lean operations: 'One is just living in the old paradigm where we don't ask workers to be involved in creative problem solving – "Keep your brains at home" was the subliminal sign over the factory's front door.

'And secondly there is the incredible resistance to change ... somehow we just resist change until everyone is doing it, then we jump on the bandwagon.'

And in industries outside the manufacturing sector it seems that these barriers are too high to summit.

Despite the obvious benefits of Lean practices, as Bodek points out about resisting change, not many companies in sectors outside manufacturing have attempted to take the ideas on board and make them their own. The number of companies doing so in South Africa is far from impressive as well.

But could all this be about to change? Norman Faull, a professor of manufacturing at the UCT Graduate School of Business (GSB), thinks yes.

Faull, who has run a short course on Lean thinking in manufacturing at the UCT GSB for the last 15 years, has just launched the Lean Institute Africa – a landmark initiative that is set to drive the spread of Lean operations to companies throughout South Africa.

The Lean Institute Africa (LIA) is a partnership between the UCT Graduate School

of Business and global Lean consulting firm Competitive Capabilities International.

'This is a first for the African continent and we are on a mission to spread the word on the efficiencies a Lean approach can bring to a business and the tools to achieve this,' says Faull, who is also director of the institute.

The tools of Lean operations are to be initially offered through a rigorous two-day programme that will, for the next twelve months, travel to the country's four major cities – Port Elizabeth, Johannesburg, Cape Town and Durban.

Far from being a once-off programme, the LIA has committed itself to a long-term rollout of Lean tools. Individuals that come to the course for the first time will be able to return the next year to receive more advanced techniques.

'We want to create a growing community of people skilled in using these tools. In order to do this we have committed ourselves to helping companies to develop their staff over time,' says Faull.

And while Lean is traditionally embedded in manufacturing, Faull is equally determined to spread the message beyond, with the construction sector a likely candidate.

Faull's view that this sector, as any other industry, can benefit from Lean operations, is supported by the work of Dr Tariq Abdelhamid at Michigan State University (MSU).

Abdelhamid, the academic council chairman of the Lean Construction Institute based in the US, is a leading figure in spreading Lean operations to the civil engineering sector across the US.

Founded in 1997, the Lean Construction Institute (LCI) (www.leanconstruction.org/) is the main powerhouse advocating and conducting research on Lean production in the US construction sector.

Abdelhamid runs the Construction Management Program at MSU and specialises in a course on Lean Construction Principles and Methods.

According to him Lean construction has escaped canonical definition mainly because Lean principles defy easy characterisation. A frequently referenced definition used today is that of the LCI:

'Lean construction is a production management-based philosophy emphasising the need to simultaneously design a facility and

its production process while minimising waste and maximising value to owners throughout the project phases (including the post-construction phase) by improving performance at the total project level, using a conformance-based vs a deviation-based performance control strategy, and improving the reliability of work flow among project participants.'

According to Glen Ballard, co-founder of LCI, 'Lean project delivery changes the job site concept of reliability, eliminating the "systemic lying" that pervades traditional project management', and that 'with Lean, control means insuring outcomes starting at the crew level. A project is truly under control when you do what you say you're going to do and minimise project disruptions.'

Greg Howell, also a co-founder of LCI, believes that 'understanding the reliable work flow imperative in Lean production runs counter to the construction industry's "can do" culture. But we must move beyond the deep cultural aspects of that mentality and create a system that cultivates judgement and reliability. We'll never trust each other if we don't become more reliable.'

A number of construction companies in the US have embarked on Lean conversion initiatives and are starting to reap the benefits.

According to Abdelhamid, The Boldt Company, a national provider of construction in the US which runs consulting and maintenance services with an annual sales volume of \$400 million, is embracing Lean principles.

Paul Reiser, Boldt's vice president for production process innovation, cites three reasons for being attracted to Lean:

'First, Lean is simply systematically applied common sense. Second, it is counterintuitive. Unlike anything I've seen before, it causes us to rethink how we manage work. And, finally we saw it as an opportunity to deliver high-value facilities to the marketplace in shorter time.'

In South Africa, evidence that other sectors that can also stand to benefit from thinking more leanly has begun to emerge.

Recent research at St Luke's Hospice in Cape Town, under the guidance of Faull, has shown that Lean practices can be successfully translated into the healthcare sector in South Africa.

'The healthcare sector is under the siege of rising costs and falling services and both are complex interactive systems that naturally lend themselves to the types of improvements made possible by Lean methods,' says Faull.

'There is no doubt that hospitals today face a great challenge. Reimbursement levels are declining, costs are climbing, and revenues are falling. The first reaction is usually to use traditional cost-cutting methods. Hospitals have been forced to repeatedly implement cost-cutting measures to stay profitable.'

But, as many can testify, these measures do not always bring success. The question that hospitals and clinics the world over are now asking is, how can they lower costs without compromising quality?

Lean thinking offers a solution. 'It is possible that this approach could signal a new way of looking at these critical services. Helping to unlock the magic formula of cutting costs without losing quality,' says Faull.

The research focused on the drug ordering and delivery process – an area within the system that St Luke's identified as needing attention. The research group used a Lean tool known as Value Stream Mapping (VSM) to develop a picture of current practices. They then combined this information with

the discipline of the Toyota Production System rules in order to define improvements.

And the results? Researchers came away from the project satisfied that their intervention was successful. Most significantly, the project appeared to have a very positive effect on the attitudes and mindsets of the staff involved.

In addition to implementing a number of changes in the process under study, the research also identified a number of enabling factors or catalysts that were important in implementing the new systems successfully. These included showcasing successful results and clearly identifying the benefits of change.

'The solution must have a noteworthy impact on the daily duties of the potential agents of change. Through this improvement the impetus is created to make further beneficial changes,' says Faull.

With the Lean Institute Africa as the vehicle, Faull says he aims to deliver these benefits across the board in South Africa.

More info

Junita Abrahams 021-406-1323
www.gsb.uct.ac.za/leaninstitute

Lean Institute Africa

Building the Lean approach to operations

The Lean Institute Africa (LIA) based at the UCT Graduate School of Business seeks to promote Africa's prosperity through the use of the Lean tools. Lean Thinking is an integrated set of industrial principles and methods that grew out of a study of the global automobile industry. It enables companies to make a *lean leap* to perfection, by eliminating all waste and creating a smooth flow through any set of processes.

The workshop includes the following:

- an introduction to Lean – the basic principles and an overview;

- producing to customer demand;
- value stream mapping.

The workbook, *Learning to See*, will be used throughout.

Tuition fees: R5 950.00 including VAT

Dates: 23–24 February 2005 – Johannesburg
May 2005 – Cape Town
August 2005 – Durban

For more information please contact:
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Leading change in emergent markets





Strategic capability

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THE 'GLOBAL VILLAGE' is increasingly becoming a reality. International trade barriers are falling and even relatively small organisations have the opportunity to compete internationally OR to be crushed by international players. International airfares have become a commodity and, in real terms, are a fraction of what they were three decades ago.

At current exchange rates South African organisations are not particularly price competitive internationally and other players like China and India have the potential to overwhelm South African entities that do not have clear plans to adjust to changing circumstances.

A clear, succinct, robust, defensible and viable business strategy is vital for success and growth, but 90 % of strategic plans fail.

The development of a robust strategic capability, the ability to formulate a clear, enduring strategic definition, and the ability to analyse the competitive environment in a systematic, structured manner are all essential components of global competitiveness.

Coupled to this, the capability to formulate strategic plans to achieve strategic objectives and to execute these plans consistently and reliably in order to achieve the stated objectives is a critical requirement for sustainable business success.

The above statements seem intuitively sound until one realises that one of the major reasons for the 90 % plus failure rate of strategic plans is the lack of a clear definition of the word 'strategy' itself. Organisations pay lip service to strategy but few can define strategy succinctly and those that can offer definitions which at least at first glance do not agree.

Professor Malcolm Macdonald defines strategy as 'doing the right things' and relates strategy to market critical success factors, market attractiveness factors and market relative strength and competitive advantage based on these factors measured relative to competitors in the context of own products for markets.

Professor Michael Porter defines strategy as 'the creation of a unique and valuable position involving a different set of activities' and states that 'strategy is making trade offs in competing, and choosing what not to do'. He adds that strategy is NOT the Internet or

any technology.

Michel Robert defines strategy in terms of a series of strategic drivers which he asserts are common to all organisations. He asserts that every organisation should select one and only one of these drivers as the primary driver and formulate strategy accordingly.

Others use the word 'strategy' to describe a way of doing things, wheeling and dealing (stratagems), and even as a 'polite' word for unethical behaviour. In practice, a group of people seeking to formulate a business strategy have a high probability of not really understanding one another and therefore not producing plans that work.

Another definition of strategy would be 'the essence of why a business exists, where it is going and how it plans to get there'.

Inherently the execution of business strategy is future focused and implies a requirement for formal planning of a measurable plan of action to accomplish the desired competitive outcome measured in terms of economic and other measures of competitiveness, profitability, market share, etc.

As an engineer venturing into the field of management consulting and the effective, strategic application of information technology in business fifteen years ago, it rapidly became apparent to me that effective strategic analysis, design and implementation were critical issues facing business. What was required was a robust definition of the parameters required to define a strategic plan, effective methods of conducting the necessary analysis and design, and a robust approach to the execution and implementation of the resulting plans.

Unlike the activities typically associated with the activities of the professions primarily associated with the design and creation of new end states, of which engineering is the foremost, strategic planning involves an organisation seeking to change itself in frequently abstract and intangible ways which are significantly impacted by the psychology of change and the response of the human psyche to uncertainty and change.

The importance of this activity suggests that it will be a well-documented and robust body of knowledge amongst some body of highly qualified professionals and that the basic application of the techniques will be well understood amongst the practitioners of

management in most organisations. Practice is very different, however. 'Strategic planning' is frequently a euphemism for a three-day conference at an expensive venue, strategic facilitators are frequently employed more for the sake of an experience than an outcome, and strategic plans are generally verbose documents with little or no measurable or actionable content which can seldom be related to what happens in practice.

Contrast this with the practice of civil engineering or any other engineering discipline where well-established and well-documented methods are taught and applied consistently throughout the world. For example, simple tests for determining the properties of soils are applied consistently and reliably to obtain measurements for the design of complex and mission critical geotechnical structures.

Drawing on this experience, strategic capability is defined as 'the ability to concisely, accurately and repeatably define the strategy of an organisation, determine its strategic context, identify the required organisational future state, plan the transition to that state, and execute the state change in such a way that the final state is recognisably the originally planned outcome and delivers the planned outputs'.

This definition requires robust and repeatable methods; this is the essence of strategic capability.

True strategic capability requires an organisation to take on board a set of methods and disciplines and integrate them into the day-to-day operation of the organisation (strategic governance) in such a way that the organisation develops a culture of continuous competitive improvement that positions it ahead of its competitors on a sustainable basis.

In order to do this it is first necessary to define the critical driver or drivers of the organisation, what makes it 'tick'. These drivers include:

- The core economic driver – how do we manage finances differently?
- The core human resource driver – how do we utilise people differently?
- The core market differentiator or value proposition – how do we present our products and services differently?
- The core asset – the fundamental asset cen-

tral to what we do and that differentiates us

- The core technology/service or capability
- The essential reason the organisation exists – why did the organisation come into existence? What keeps us going? What is the difference we want to make in the world/society?
- The core values – moral and ethical parameters that constrain and guide us
- The core strategic constraints – what we do, do NOT do; the types of activity that we expressly exclude from our operations
- Other drivers as may apply to any particular organisation

In practice only one or a concisely inter-related group of the above factors will represent the essence of corporate strategy – the rest will be common to other players in the same industry segment. It is important to understand that within apparently homogeneous industries there are core drivers which differ and which dictate drastically different operational behaviour. For example, Pick 'n Pay, Edgars and Woolworths are all retailers, but each operates with a distinctly different core economic strategy which dictates numerous aspects of their operations.

All major authorities on strategy agree that the essence of strategy remains constant for decades, accordingly an investment in determining the core strategic drivers of the organisation, documenting them, and ensuring that all personnel know what they are is an important component of developing strategic capability.

In order to develop effective strategic plans it is necessary to understand the full strategic context of the organisation using methods that produce structured, numerically based results. The writer has developed a commercially available software tool, facilitation method and skills set which enables any organisation to quickly and efficiently develop measures of the strategic context which should address factors including:

- Owner/shareholder critical success factors
- Core strategic drivers
- Market attractiveness factors, critical success factors, own and competitor product for market ratings of competitive advantage, etc
- External and long-term factors, threats, opportunities, scenarios, etc, which impact the operation and future of the organisation
- Internal factors, including worker and staff critical success factors and other internal climate factors
- Corporate strategic governance – the extent to which executives are focused on strategy rather than operations, the effectiveness of operational delegation, the effectiveness of strategically focused decision-making and day-to-day execution of decisions

■ Corporate strategic objectives – clear definition of where the organisation is going and what it wants to look like when it gets there in terms of market share, turnover, etc

■ The capability of the organisation to analyse the strategic context, design solutions and execute those solutions effectively on an ongoing basis in the form of a culture of continuous strategic improvement directed at ensuring that the gap with competitors is consistently and constantly increasing

The analytical capability of the organisation rests on the use of a tool and method such as referred to above applied to the full spectrum of the strategic context just listed. Such analysis should work in such a way that it harnesses the collective knowledge and experience of the executive management of the organisation and its advisors.

The design capability rests on the use of simple reproducible methods to systematically evaluate the strategic gaps identified by the strategic analysis in order to formulate projects and actions to close the gap between the forecast state of the organisation and the desired (objective) state. This analysis should take place in a structured manner that enables all components of the strategic context and all resulting projects and plan actions to be evaluated in terms of relative importance in closing the future strategic gap such that only those projects and plan actions that will make a real difference are executed.

This design capability should extend to the development of a detailed strategic action plan with resource allocations which can then be developed into a full-scale programme of projects which are progressively undertaken as part of a programme of ongoing 'rolling' organisational improvement within the parameters of the formal disciplines of project and programme management.

The full development and execution of such plans is highly challenging and are discussed in detail in my book *The critical factors for information technology investment success* (Robertson 2004).

The critical factors for the effective management and implementation of strategic plans are:

- Executive custody, including the management of the change process in the business, the management of the technical personnel providing specialist services and the management of the integration of strategic and other technical skills with the operational side of the business
- Strategic solution architecture – the design of a solution that will work in practice in terms of a robust understanding of the core strategy of the business

■ Strategic alignment – defining and managing the process of change in such a way that new systems, procedures, etc, are in harmony with the business and that the business is progressively and systematically adapting to new methods, tools, systems, etc, as they are rolled out – ensures that the solution and the business arrive at the same place at the same time

■ Business integration and optimisation – integrating the solution into the business together with optimising the business in terms of the desired end state. This is the operationalisation of the strategy in terms of bringing about change in the business, including management of the psychology of change, training, etc

■ Programme and project management in terms of the formal disciplines that have been well established by the project management profession with supplementation by the other factors listed here

■ Information management and information technology – all aspects of managing information. Without effective strategically orientated management information, sustainable competitive change is a matter of luck, not judgement. Developing and implementing information delivery solutions that support effective delegation and effective decision-making at all levels is a major challenge in most major strategic programmes today. This point does not necessarily require the acquisition of new computer technology but it may well require the reimplementation of existing systems

■ Operational strategic projects and plan actions – all the activities which are intended to bring about the desired end state. Frequently these projects are undertaken without the overall management and implementation context set out above and this is a major factor in the failure of plans to deliver

All the above should take place in terms of an overall strategic management context that is designed to operationalise the process of strategic planning and implementation. Good business operations are simply an extension of good strategic planning.

Strategic planning is not something that takes place when time permits amid the hurly-burly of 'real world operations', strategic planning and execution should be the very life blood of the operations of a business, a focus on continuous improvement constantly informed by a deep understanding of why the organisation exists and what makes the organisation competitive.

Those organisations that succeed in sustainably developing this level of strategic capability can be expected to thrive in the global village, those that do not face a bleak future. ■



Text Leon Erasmus
Executive Director, DLK Business
Development Engineering (BDE)

Standards certification is a continual process

FOR QUALITY CERTIFICATIONS to keep adding value to the bottom line companies must realise that the processes that earned recognition must be continually improved. The motivation to get certified should not be seen as a once-off process.

For example, the ISO standard is just that – a standard, and standards merely act as baselines or foundations for continually striving for business excellence. The process of business analysis and continual improvement is one that should never stop.

Since quality standards were introduced during World War II we have seen a steady generation of ISO standards, the best know being the ISO 9001.

The enthusiasm by South African companies to comply with internationally recognised standards took off in the 1990s when the changing political situation signalled a return to global trade.

With it grew a rash of consultants who tried to make a quick buck from uninformed clients. Luckily, many of these people have disappeared but some still lurk in the dark corners of confusion to stalk on unsuspecting clients.

For companies wanting to gain from certification they need first to understand what it signifies, how it can continually help them grow their businesses and how to recognise a credible consultant to guide them through the process.

ISO 9001 is a specification for the design and development of a business management system that ensures that the qualifying company manages and satisfies customer needs and expectations.

There are differing views on how achieving this standard should be addressed and this has led to many people with limited exposure to world-class management systems selling themselves as experts on ISO 9001. Many of them may well be, but do they have the ability to translate their experience into what a management system needs to add value to their clients' businesses?

In the short term companies may want to qualify for ISO 9001 as cheaply and as quickly as possible, and there are many consultants out there only too happy to oblige. But, for sustainable growth a well-designed, developed and thoroughly implemented quality management system should create more opportunities for improvement and thus profit.

A 'cut and paste' ISO certification that does not focus on return on the investment spent developing it is a waste.

It is vital to research the range of help available for ISO certification and secure the services of a consultant who can help define what the company requires and spell out the returns.

The search should check out the consultant's company profile, the range of experience and qualifications, partnerships, staff, and their approach to certification.

Next, check out the reference sites as these give an idea of service delivery and customer satisfaction. Ask to see illustrations of management systems implemented at these sites.

A project methodology is fundamental to successful ISO certification. This should

include a gaps analysis, current business process modelling, design business blueprint, development of the model and blueprint, implementation of the developed solutions, an independent process analytical audit and maintenance and improvement.

Re-engineering a client company is unavoidable. Even if only a few procedures are changed this process will have an impact on the business, which is why its essential to ensure that the consultant has some proven re-engineering methodology that considers all aspects of a business.

In these days of eBusiness the consultants must also be able to supply clients with the option of an electronic solution to management system needs.

When it comes to the nuts and bolts of modelling, analysing and simulating business processes software and modelling tools are required. These should be easy for the modeller and clients to access and use.

Tools should also support the presentation of the process for training and management purposes. Configuration of the management process should be sound and rigid and analysis of the process for activity-based costing and simulation should be possible.

These guidelines are the starting point for companies wanting to instil a culture of continual improvement in their operations. The ISO certification that results from this commitment will go a long way to ensuring financial viability and operational agility in a globally competitive market.

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Engineers in the boardroom a formula for success

JOMO KHOMO IS NOT THE TYPE of person to rest on his laurels. As a chemical engineer with substantial experience, one wouldn't expect him to be in the final months of an MBA degree. But, for Khomo, the shift to supplement his engineering skills with business know-how is a vital step in his career and personal ambitions, and he says the sector needs to wake up to the reality that accelerating business and management skills is a key area that needs improvement.

According to Khomo, there are some people with business experience in the South African engineering sector but that most of this experience is highly relevant to the past where the economic dynamics and structures were different and did not offer opportunity for benchmarking against global competitors.

'We now have a more open economy which means that we are highly vulnerable to outside competition and threats, and the more people we have equipped with international business skills the better a position we will be in to compete,' he says.

Khomo, who has worked at mining process plants with De Beers as well as in the chemical sector for Hutsman Tioxide, has substantial experience in process engineering, project management, as well as product development and production management.

He is one of four students from the engineering field that have been undertaking an MBA this year thanks to full funding from the Sainsbury Fellowship at the UCT Graduate School of Business (GSB). The Fellowship specifically finances South African engineers who undertake an MBA at the GSB.

The substantial scholarship, one of the few available for the individuals in the engineering disciplines, is specifically geared to boost business skills in the local sector as well as provides students with the opportunity to study for two months at Cambridge University in the UK.

According to Khomo, with South Africa now a player in Africa and in all new initiatives within the AU and Nepad, the country also needs business people who understand the continent in particular, including its heritage, culture, challenges and opportunities.

'The shift towards a more African business approach also needs to be grown. We will need people who will focus on understanding the differences and similarities in our continent and thus come up with ways of talking business in Africa to realise the African renaissance that we so dearly need,' he says.

He adds that engineers are trained in unique skills such as being analytical, con-

ceptual as well as innovative, and that to combine this with business skills is a great formula for success.

'The combination of our engineering and business skills offers an edge on how best to position a business and how to ensure sustainability in a highly competitive global marketplace,' he says.

'Bearing in mind that innovation is at the heart of business growth, those who fail to see and interpret opportunities will fail to contribute much to the growth of their business or the sector. The engineering-business combination can for example offer an invaluable appreciation of value chain growth and improvement in particular.'

Being a chemical engineer and having thus far focused on the engineering discipline in his career, Khomo is setting himself the task of making the most of his new business skills.

'The MBA is vital to launching me to realise my career goals of moving into operations management, and especially into general management and directorship. I feel better equipped to contribute to general management and leadership challenges from a different angle to someone with skills acquired from purely an engineering background, particularly with my exposure to other areas like finance, marketing and human resources,' he says.

'There is also a focus at UCT on self-awareness and leadership. This presents one with the chance to grow personally, an opportunity that we often do not have in our workplaces. On the whole, one gets exposed to an environment in which previously acquired skills, beliefs and opinions, strengths and weaknesses are all put to a test and the result is a steep learning curve, but one that makes you stronger personally and professionally.'

Khomo's career ambitions are on the broad side for the moment as he wraps up his MBA, but he would like to contribute to the growth of the South African economy by utilising his strengths.

'I believe one of my strengths is in operations, and this is one area where I can work to help create jobs and thus a stronger economy and society,' he says.

'Engineering has always been the backbone of growth and innovation globally and for any country to continue being a leader globally, engineers need to start playing a more significant role in the boardroom.'

Info on the Sainsbury Scholarship for engineers: 021-406-1338



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HIV/Aids awareness beyond the company and the employee

PPC, A SUBSIDIARY OF the Barloworld Group of companies, has embarked on an extensive programme to extend its HIV/Aids awareness programme beyond those employed by the company, to reach family members and local communities.

PPC started its HIV/Aids campaign with Voluntary Counselling and Testing Counselling (VCT), which is being rolled out at all its operations in South Africa. Support for this element of PPC's campaign, which encourages all employees to 'know their status' has exceeded expectations with close on 90 % of personnel agreeing to participate in the voluntary testing.

At the heart of this campaign, internally, is a team of powerful women. The programme is spearheaded by Naomi Williams, the group's risk and environmental manager. Naomi, who is committed to HIV/Aids education and prevention in PPC, is excited about the success of the campaign. One success story she is eager to share is that of PPC Lime Acres in the Northern Cape where her team member, Sister Iris Ross, is in charge of the campaign.

Sister Iris Ross during one of the HIV/Aids awareness workshops offered to PPC employees



Sister Iris Ross is two-times winner of the PPC Lime Acres Employee of the Year award, was PPC's 2003 Achiever of the Year and went on to represent the company at Barloworld's annual, International CEO Awards.

Iris has been an incredible influence at PPC Lime Acres since 1996. Having insisted on paying for her own studies, she is now completing a degree in the study of HIV/Aids and is currently in charge of the two clinics at PPC Lime Acres. Her influence has also spread to the rest of her local community. Through Sister Iris Ross, more than 150 PPC employees have been trained as HIV/Aids peer educators. Various training interventions have equipped these volunteers with the knowledge and skills to support those who are affected or infected and help them to 'live positively with Aids'. The aim is for these trained individuals to

now take their knowledge and support into the local community. They will be responsible for educating, supporting and advising family members of PPC employees and members of the local community. At the same time, they will be encouraging these individuals to 'know their status' in an effort to address the potential impact their status may have, both on the family unit and the community.

The VCT campaign is aimed at helping those employees who are HIV-positive to receive the necessary support – medically, psychologically and nutritionally – to help them live life to the fullest. PPC believes that being HIV-positive does not have to be a death sentence. With the relevant antiretroviral treatment combined with a well-balanced diet and fitness regime, those who are HIV-positive can live a normal and healthy life.

PPC has committed to financing the disease management programme for employees who do not have access to medication through a medical aid fund.

'Whilst it is the responsibility of the South African corporate world to support government in dealing with this pandemic, we believe that it is our responsibility to give the broader community the benefit of our knowledge, expertise and assistance to help relieve the potential negative impact this may have on our country,' said Orrie Fenn, managing director of PPC Cement. □

Department of Public Works tackling HIV/Aids in the construction industry

RESEARCH INDICATES THAT the construction industry has the third highest incidence rate of HIV/Aids per sector in South Africa – and that the effect of the pandemic on the industry could raise the current skills shortage levels to 35 %.

In response to the impending crisis, the National Department of Public Works (DPW) developed an HIV/Aids strategy for the industry. Community Life Projects (CLP), a wholly owned subsidiary of the Pretoria-based multidisciplinary professional services consultancy Africon, assisted the DPW in testing and finalising the strategy. The national rollout to all the department's regional offices and provincial departments commenced in March 2004.

The overall objective of the strategy is to improve health and safety in the industry by ensuring that HIV/Aids infection rates in the industry are reduced and the impact of the disease on the industry is managed successfully and proactively.

Contractors appointed by the department on contracts exceeding a contract period of six months will now be required to offer basic HIV/Aids education to the workforce through accredited training service providers, a condom distribution programme, and an HIV/Aids awareness programme, including the provision of departmental HIV/Aids information booklets, awareness posters and monitoring the implementation of the HIV/Aids programme on site.

PILOT PROJECTS

In October 2002, the DPW appointed CLP to assist the department in testing and finalising the HIV/Aids strategy for the construction industry. CLP completed the project in August 2003 – paving the way for national rollout in 2004. This was done by:

- Developing specifications for the HIV/Aids programme that are now included in the department's tender documents
- Developing communication material for the on-site education programme
- Testing the HIV/Aids programme at three pilot sites
- Developing contract documentation to enforce implementation of the HIV/Aids programme on all DPW contracts exceeding a contract period of six months
- Assisting the department in finalising the HIV/Aids strategy based on the lessons learnt at the three pilot sites

The pilot programme played a key role in

ensuring that the strategy is consistent with the challenges facing the construction industry. The pilot projects also served to inform best practice, while providing the opportunity for the department to test communication material and the implementation process of the awareness programme.

The awareness programme was implemented at the following pilot projects:

- Construction of the Nelson Mandela Museum in Qunu in the Eastern Cape, involving some 70 workers
- Construction of a social services office in Gugulethu in the Western Cape, where between 30 and 40 workers were exposed to the programme
- A labour-intensive road maintenance project in the Bochum area in the Limpopo Province, where more than 250 workers had the opportunity to participate in the on-site HIV/Aids awareness programme

MAIN COMPONENTS OF THE PILOT PROGRAMME

- Briefing of contractors and awareness champions (people identified by the contractors who were responsible for implementing the programme on site)
- *On-site communication campaigns:* Departmental videos, posters and information booklets were specially developed for the purpose of raising awareness around HIV/Aids and the programme on site
- *Awareness training:* The City of Cape Town's HIV/Aids unit was selected as the awareness training service provider in Gugulethu, with two of the unit's peer educators from the community conducting training at four training sessions. The Bochum site received awareness training from Life Line during the two training sessions
- Pilot project implementation monitoring: these pilot projects were monitored for a four-month period. During this time, the contractor was responsible for submitting a monthly process indicator form, developed for this very purpose
- *KAP survey:* A pre-intervention survey was conducted to determine the baseline knowledge and attitude levels regarding HIV/Aids of those construction workers who were to participate in the pilot projects. Upon conclusion of the programme, post-intervention surveys provided useful data on gauging the effectiveness of the on-site programmes in effectively chang-

ing knowledge or attitudes towards HIV/Aids

■ *Site visits:* Each pilot site was visited towards the end of programme implementation to monitor and evaluate its success. Monitoring and evaluation instruments also assessed the impact of the programme on the community, as well as on the HIV/Aids-related support services in the area.

The study revealed that many communities have inadequate health services to support the workforce in practising safe sexual behaviour and that, depending on the location of the project, the workplace or construction site may still be the only place where both workers and members of the surrounding communities are able to gain information and support about HIV/Aids.

Based on the findings gleaned from the three pilot projects, a model was developed in which the relationships between the various elements of the strategy were investigated. The model confirmed the validity of the strategy, and also served to identify specific focus areas for an effective strategy.

From March to May 2004 CLP assisted the DPW in implementing the strategy by

- conducting workshops with the department's regional offices to facilitate implementation of the strategy
- briefing provincial departments of public works on the strategy and facilitating buy-in on the implementation of the strategy
- facilitating co-operation between the Construction Education and Training Authority (CETA) and the DPW in developing unit standards for HIV/Aids education in the construction industry

For the rollout of the strategy, a training manual was developed to equip managers in the department's regional offices to oversee HIV/Aids programme implementation on site and to monitor and evaluate the programmes.

The Minister of Public Works, Ms Stella Sigcau, has emphasised the fact that the success of the strategy will ultimately hinge upon the commitment of all roleplayers – be it the construction company or the individual construction worker – and their willingness to make a conscious effort to address this pandemic effectively.

More info

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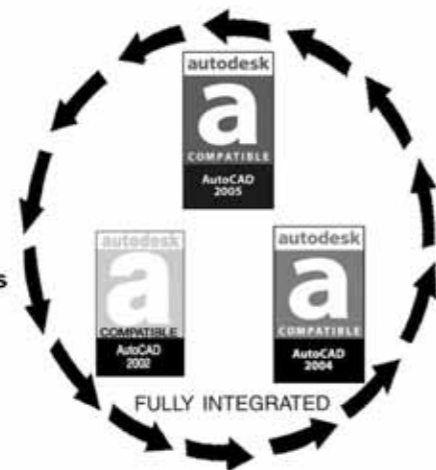
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HIV/AIDS FACT SHEET

Sub-Saharan Africa has just over 10 % of the world's population, but is home to more than 60 % of all people living with HIV – some 254 million. In 2004, an estimated 3,1 million people in the region became newly infected, while 2,3 million died of Aids. Among young people aged 15–24 years, an estimated 6,9 % of women and 2,2 % of men were living with HIV at the end of 2004.

■ Adult HIV prevalence has been roughly stable in recent years. But stabilisation does not necessarily mean the epidemic is slowing. On the contrary, it can disguise the worst phases of an epidemic –

when roughly equally large numbers of people are being newly infected with HIV and are dying of Aids.

■ Across the region, women are being disproportionately affected by HIV. Women and girls make up almost 57 % of adults living with HIV in Sub-Saharan Africa. Overall, three-quarters of all women with HIV worldwide live in this region.

■ Young women (aged 15–24) are bearing the brunt of new infections in Sub-Saharan Africa. Recent population-based studies suggest that there are on average 36 young women living with HIV

for every 10 young men.

■ Southern Africa remains the worst affected subregion in the world with South Africa having the highest number of people living with HIV in the world. At the end of 2003, an estimated 5,3 million people were living with HIV in South Africa – 2,9 million of them women. Unfortunately, there is no sign yet of a decline in the epidemic.

■ Life expectancy at birth has dropped below 40 years in nine African countries – Botswana, Central African Republic, Lesotho, Malawi, Mozambique, Rwanda, Swaziland, Zambia and Zimbabwe. All are severely affected by Aids. In Zimbabwe, life expectan-

cy at birth was 34 years in 2003, compared with 52 years in 1990.

■ Some countries in East Africa, such as Ethiopia, Kenya and Uganda, show signs of declines in HIV infection levels. The steepest drop has been in Uganda, where national prevalence fell from 13 % in the early 1990s to 4,1 % by the end of 2003.

■ However, it is much too early to claim that these recent declines herald a definitive reversal in these countries' epidemics – furthermore, the need for treatment, care and support will continue to increase for years to come.

USAID

Milestone for construction industry

THE HIV/AIDS PANDEMIC IS threatening to put a damper on what is set to be the most exciting period that the construction industry has seen in the last two decades.

That is according to Mike Lomas, CEO of JSE-listed construction company Group Five, which has set up a strategic partnership described as a milestone for Group Five and the industry as a whole. In terms of the partnership CETA will work with Group Five in re-focusing its HIV/Aids strategy and information collected through this programme will be shared with Wits University for research. This is the first project of its kind for the construction sector.

Group Five's HIV/Awareness initiative 'Know your status', to be implemented in all of its business units, will focus on increasing awareness of the disease and prevention. This includes providing voluntary counselling for people directly and indirectly affected by HIV/Aids, free testing, and supporting HIV/Aids infected employees to help them to stay healthy and lead a productive lifestyle for as long as possible.

Wits University, which is widely recognised as the leader in HIV/Aids research in South Africa, with the most comprehensive research programmes of all national universities, will collect and analyse the information obtained from Group Five's HIV/Aids programme and produce reports for use by other organisations in the construction sector.

Speaking at the launch of the project Lomas warned that although the construction industry is poised for substantial growth in the next five years, it faced the daunting challenge of finding the necessary skills to meet the increase in demand as HIV/Aids continues to put pressure on resources.

'Statistics indicate that construction growth could be as high as 8–10 % per annum, brought about by government's commitment to infrastructural development, the residential boom, and the 2010 Soccer World Cup,' he said.

'These are exciting times but dampening this is HIV/Aids pandemic, which is already impacting heavily on the industry. It is up to the industry to do whatever it can to contain the pandemic otherwise it will never be able to achieve what it has to. The development and preservation of skills must quickly become an industry priority.'

Themba Dlamini, CEO of CETA, echoed this, saying that the Building Industry Federation of SA had reported that about 22 % of the industry's 600 000 workers have HIV/Aids and that 130 000 people will have to be trained by the end of 2005 to replace those who will be lost to the pandemic.

'The financial implication facing the industry is enormous, if you consider the costs of replacing 130 000 learners who have no previous construction-related training or

qualifications but need to be qualified in construction sector related fields. To train 130 000 people at NQF Level 3 (Artisan) would cost around R7,8 billion,' he said, adding that the cost of investing in HIV/Aids awareness training and testing for workers is considerably less.

'If industry is to merely support HIV/Aids awareness training and testing, it is estimated that it would cost around R390 million to educate the same number of people about HIV/Aids.'

Professor Elizabeth Pienaar, head of construction economics and management for the Faculty of Engineering at Wits University, pointed out that the full effect of the disease on the building industry is not known, despite the fact that the industry is said to have the third highest incidence of HIV/Aids in the country.

'The construction sector has a major influence on the economic and social development of South Africa, contributing to 2–3 % of GDP. It is also a major source of employment. However, the sector's contribution will be undermined if the pandemic is not addressed,' she says.

Group Five chairman George Thomas is confident that the Group Five/CETA/Wits University project will go a long way to ensuring that people employed within the construction sector have access to information on HIV/Aids and prevention thereof. ■

The Construction Regulations Are clients and designers complying?

THE PROMULGATION OF THE CONSTRUCTION REGULATIONS WAS intended to realise optimum multi-stakeholder contributions to Health and Safety (H&S) by clients, designers, project managers, and quantity surveyors. Adequate allowance for H&S during tendering/bidding has been a contentious issue – in other words, should H&S conscientious contractors make adequate allowance for H&S, they may run the risk of losing the tender/bid to less H&S-conscientious contractors.

The Construction Regulations require a series of sequenced interventions and documents which are directed towards the elimination of hazards during design and construction and the consequential reduction of risk.

The H&S specification is intended to be project specific: 1 'Definitions' specifies all H&S requirements pertaining to the associated works on a construction site. The term 'specification' and the emphasis on 'a' construction site should be noted – in other words, detailed and project specific, as opposed to generic.

Referring to various regulations does not constitute a specification – the Principal Contractor and Contractors (SCs) do not need to be referred to regulations that can be read by any person capable of reading. Thus the issue is that of process, the intention being to 'design out' hazards. By identifying hazards in an H&S specification the author is reminded of their existence and is thus prompted to further deliberate modification of the design and/or substitution of hazardous materials.

4(1)(a) requires the client to provide the Principal Contractor (PC) with an H&S specification; 4(1)(b) requires the client to promptly provide the PC with any information which might affect H&S (does not state when); and 4(1)(f) requires the client to provide the PC with sufficient H&S information when changes are made to the design or construction.

5(1) 'Principal Contractor and Contractor' requires an H&S plan based upon the client's H&S specification to be compiled. However, 1 'Definitions' requires that an H&S plan address hazards identified and that it include safe work procedures to mitigate, reduce or control the hazards – it does not state that the PC or contractor are the only stakeholders that should identify the hazards. 9(2)(a) requires designers to provide the client with all relevant information that may affect the pricing of the work. 9(2)(b) requires that designers inform contractors about any known or anticipated dangers or hazards and make available all relevant information for the safe execution of work upon being designed, or when altering the design. This is necessary to enable the PC to make adequate allowance for H&S. In other words, doing so during the contract would be too late as there may be financial implications (excluding design changes during the construction process).

In terms of 9(2)(c)(i) designers are required to provide the PC with a geo-science technical report, in terms of 9(2)(c)(ii) the loading the structure is designed to withstand, and in terms of 9(2)(c)(iii), the methods and sequence of the construction process. Given that 4(1)(h) requires clients to determine whether the PC has made sufficient allowance for H&S at tender stage, clearly any H&S requirements resulting from 9(2) need to be included in the H&S specification.

9(2)(d) requires designers to modify the design or substitute materials where designs require the use of dangerous procedures or hazardous materials. The question arises as to what is required if this cannot be achieved. The optimum approach would be to highlight the hazards and risks in the H&S specification, which will enable the PC to make adequate allowance for H&S.

No regulation should be read in isolation, however, as many regulations are interrelated because of the design and construction processes and the intended process in terms of the Construction Regulations: design □ risk assessment □ revise design □ H&S specification □ PC and contractor review of H&S specification □ pre-tender risk assessment □ pre-tender phase H&S plan (not required in terms of the Construction Regulations) □ allowance for H&S □ contract award □ risk assessment □ contract phase H&S plan □ risk assessment □ construction (continuous risk assessment throughout). ■



Industry Scan

NEW COURSES FROM SCT

THE CEMENT & CONCRETE INSTITUTE'S School of Concrete Technology will introduce three new courses in 2005. One of these – together with a course specifically for engineers – will be offered in the evenings.

Dr Rod Rankine, C&CI Education and Training Manager, says the three new courses are Shotcrete Management and Supervision, Concrete Road Design and Construction, and Concrete Structures – Analysis and Design.

The three-day shotcrete course covers aspects of concrete technology specific to use of the material – particularly in a mining environment. 'Practical considerations such as planning and logistics, equipment selection and maintenance, as well as troubleshooting are included,' Rankine stated.

Concrete Road Design and Construction will provide engineers with a broad overview of the subject. The design segment is based on C&CI's award-winning cncPave design software and the course also incorporates hands-on tutorials using cncPave.

Concrete Structures – Analysis and Design is a 48-hour course that can be presented over 12 days in sessions of four hours. 'This course is aimed at civil and structural engineers who wish to refresh their reinforced design skills,' Rankine explained. 'Together with the SCT's three-day Concrete Technology for Engineers course, it will from next year be offered in the late afternoons – say from 16:00 to 20:00 – to accommodate those unable to attend daytime lectures,' he stated.

Rankine said the school would next year also for the first time offer two of its standard courses in Namibia.

'And, to make training more affordable at a time when it is urgently needed in southern Africa, the SCT will maintain its 2004 price levels for 2005.'

For a free copy of the C&CI 2005 Education Programme, contact Rennisha Sewnarain on tel 011-315-0310 or e-mail rennisha@cnci.org.za or visit the C&CI website www.cnci.org.za

PHYSICS PROF DEVELOPS SYSTEM TO MONITOR CEMENT CURING

AN ELIZABETHTOWN COLLEGE PROFESSOR has developed an embedded sensor that functions in cement much like a thermometer in the Thanksgiving turkey.

'The thermometer indicates if the turkey is done by measuring its internal temperature,' said Nathaniel Hager III, an adjunct faculty member in Elizabethtown's physics and engineering department. 'The embedded sensor does the same thing in concrete by monitoring how quickly water involved in the curing process is chemically combining with Portland cement.'

Hager's research, conducted with business partner and chemist Roman C Domszy, involves embedding a disposable sensor in a concrete structure when the cement is poured. 'A fast electrical pulse is bounced off the sensor, producing a reflected pulse that contains molecular signals due to unreacted water and water combining with portland cement,' Hager said. 'Tracking these two signals along with cure time provides a better understanding of the cure process and identifies irregularities that lead to improper cure. Essentially, we're looking for the signals that correspond with cement strength. If we don't get them, we have to trust the signals to tell us that something is wrong.'

There are a number of applications in the construction industry for the system, which Hager and Domszy refer to as Time-Domain-Reflectometry (TDR) Concrete Cure Monitoring. The system could be used by companies that make cement and cement additives to determine how to optimise the curing process. It could also be used in the field to help test structures – 'to see if cement is fully hard' – or on multilevel structures, to determine when to pour the second layer. And it could help identify residual moisture in cement floors before surface coatings, like epoxy, are installed, minimising moisture damage and reducing wait times.

'When the thermometer indicates that the turkey is getting done too quickly or too slowly, you take corrective action like turning the oven temperature up or back,' Hager said. 'This moni-

toring system allows those in construction to do the same thing with concrete.'

An article on Hager and Domszy's research, which was funded in part by the National Science Foundation's Small Business Innovation Research (SBIR) programme, appeared in a recent issue of the *Journal of Applied Physics*. A patent for their concrete cure monitoring system should be issued in the near future.

Newswise

AGEING PROFESSION POSES SKILLS DILEMMA

THE URGENT NEED for South Africa to produce more qualified concrete technologists was spelled out at the 2004 Cement & Concrete Institute's School of Concrete Technology (SCT) graduation ceremony for the top-level Advanced Concrete Technology course presented by the SCT.

Dr Rod Rankine, the Institute's Education and Training Manager, said South Africa was facing an unprecedented boom in construction with projects such as the 2010 Soccer World Cup and Gautrain set to make massive demands on the building sector. 'These are projects that will demand substantial technological training, yet South Africa's acute skills shortage is reflected by the fact that the average age of practising civil engineers in this country is 53. When these engineers retire, they will leave an alarming skills vacuum to fill,' Rankine stated.

The Cement & Concrete Institute's School of Concrete Technology has offered tuition for the UK Institute of Concrete Technology's globally recognised Advanced Concrete Technology course since 1990. To date, the SCT has produced 51 graduates – some with examination results that surpassed the best in the world.

Rankine said the SCT was now the only ACT training institute presenting the course on a residential basis, as opposed to Internet learning that had become the norm in the UK. 'We will continue along this road as we believe one-to-one tuition has many benefits for a course as advanced as this,' he stated.

CONTRALESA BUYS INTO CONSULTING ENGINEERING FIRM

Signing the agreement between Contralesa and UWP Consulting are (seated from left): Zulch Lötter, managing director of UWP, and Patekile Holomisa, president of Contralesa and board member of UWP; (standing, from left): Mpumalanga Gwadiso, CEO of Contralesa Investment Holdings, and Pinkie Mota, member of Contralesa's national executive committee and board member of UWP



the interests of the latter in mind. In rural areas traditional leaders have always taken responsibility for their own community resources. Contralesa Investment Holdings aims to add value and by investing in a stable, established company with proven competence in rural infrastructure development, this requirement is met.'

THE CONGRESS OF TRADITIONAL LEADERS of South Africa (Contralesa) has, through its investment arm, acquired a 25,1 % stake in UWP Consulting, a Johannesburg-based multi-disciplinary consulting engineering firm established in 1972.

Prince Mpumalanga Gwadiso, CEO of Contralesa Investment Holdings, says the acquisition has been made in line with its aim to achieve good returns not only financially but also in terms of real benefit for Contralesa members and the largely rural constituencies they represent.

'The shareholders in Contralesa Investment Holdings are members of Contralesa with the ultimate beneficiaries being their communities and this investment in UWP was made entirely with

UWP Consulting specialises in structures, township services, water and sanitation, development planning, roads and transportation, mining infrastructure, plant and fleet management and information management. The company has offices throughout South Africa and recently expanded its operations into the SADC countries, a move that fits well with Contralesa's current initiative to expand its membership into southern Africa.

UWP managing director Zulch Lötter points out that the company's network of 13 offices in South Africa and an office in Zambia, all staffed by experts across several disciplines, will ensure access to multi-disciplinary consulting services for Contralesa's wide constituency representing all sectors of society in all regions of South Africa and neighbouring countries.

This acquisition of shares by Contralesa Investment Holdings takes UWP Consulting's empowerment shareholding to approximately 33 %. In terms of the agreement, three Contralesa members have been appointed to the UWP Board of Directors. They are Chief S P Holomisa, Princess P Mota and Chief S Xolo. □



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A Namibian Alternative



Tyre shops currently pay \$7 to dispose of tyres, providing residents with a useful recycling option ...

THE CONSTRUCTION OF the Habitat Research and Development Centre (HRDC) was requested by the Ministry of Local Government and Housing in response to a design competition that was won in 2002. The centre is built with virtually zero-cost low-grade material found in rural areas, allowing local residents to be educated on the use of alternative building supplies in the construction of affordable homes.

Project architect Nina Maritz appointed Bührmann & Partners as the civil and structural engineer on the venture with the unusual instruction to design the building using alternative materials. 'Our task as structural engineers was to assist with the design of the building using sustainable alternative materials. This meant that we had to retrain ourselves to think along unconventional lines since the project did not require us to conform to municipal regulations,' explains Rolf Trossbach, senior partner at Bührmann & Partners.

'The use of compressed soil-cement bricks was one of the most interesting materials that we used. These bricks were made on site using the Hydraform system; a patented machine rented from a local builder and stockpiled sand from Otjomuise a few kilometres away. The activity was quite labour intensive and required the bricks to be profiled, dry stacked and then plastered around window reveals and in corners,' notes Rolf.

Another interesting building material used was

rammed earth. This entailed the use of steel shutters to compress earth into a solid block before sealing it with seal oil to preserve it. The relatively inexpensive sealant preserved the wall from further deterioration.

Structures were pre-tested by constructing sample walls in order to test whether or not the various components were durable for building purposes. These structures were designed and detailed with the help of AllyCAD. 'I remember the first time that we were exposed to the program. We were given a three-month roads project and immediately realised that we needed the help of an extensive computer-aided draughting system in order to meet our deadline. This led us to acquire AllyCAD, which we used with great success. Since then we have used the product on all our projects as it cuts down on project time and helps us to produce a cost effective end result,' says Rolf.

Other innovative building materials that were used include the use of the local invader prosopis tree for shade and security screens in front of windows and extensions of overhangs and walkway shading. 'A local company cut timber "droppers" or "latte" from the invader trees in the valley north of the industrial area. The trees were then debarked and treated on site by being soaked in a mixture of old motor oil.'

The 'Spanish' reed found in local riverbeds was another invader plant that was used. 'The reeds were locally harvested by unskilled workers and

were mainly used to provide ceiling walls and cladding for cupboard units. The ceilings were insulated by either using old feedbags filled with wool and lavender in order to prevent moth infestation, or by using waste polystyrene alternated with layers of flattened corrugated cardboard boxes,' explains Rolfe, adding that the insulation had a minimum thickness of 60 mm.

The self-made gabion wall was one of a kind. It was constructed using wire baskets made on site and concrete bricks and rubble from a demolition site. The same demolition site also provided the B-grade steel that was used for steel windows, columns and roof structures on the building.

The use of old car tyres provided a new alternative. The tyres were used to build the archive walls and were stacked on top of each other and rammed full of a soil-cement mixture. Although the use of cement was restricted, the team used small quantities as a binder in each tyre as the stockpile contained no clay. Tyre shops currently pay \$7 to dispose of tyres, providing residents with a useful recycling option.

The first phase of the centre, consisting of the admin wing, was completed in April 2004, while the public wing has been completed in September 2004.

More info

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KWEZI V3 NOW SOUTH AFRICA'S LARGEST BLACK-OWNED ENGINEERING CONSULTANCY

The Kwezi Group, an empowerment company with ambitions of being a dominant player on the African continent in infrastructure development services, mining equipment supply and information and communication technologies, has increased its equity stake in Kwezi V3 Engineers to 70 %, thus effectively creating South Africa's largest black-owned multi-disciplinary engineering consultancy. Kwezi's chairman and founder, Siphoh Mahamba, says the deal, which runs into tens of millions, is of strategic importance to Kwezi and Kwezi V3 in two key areas – business growth and the development of human capital. Kwezi first acquired a 40 % stake in the consultancy in 2001.

'We have aspirations for growth in South Africa and other African countries. We believe Kwezi V3, with its core competencies and significant pool of professionals and a robust and efficient training programme, is well poised to contribute to the South African government's mega-infrastructure projects and to other infrastructure development opportunities on the African continent. We also believe that through our growth, we can create further exciting challenges in the various engineer-

ing disciplines for all our engineers.'

Kwezi, which was established in 1997, has interests in South African toll operator Intertoll, routine road maintenance, and mining equipment supply.

Founded in 1977, Kwezi V3 Engineers, whose chairman is Dr Franklin Sonn, a former South African ambassador to the USA, has grown to be one of the leading multi-disciplinary engineering consultancies in southern Africa. With 27 offices in South Africa and offices in other African countries and Abu Dhabi, Kwezi V3 employs 500 people, 60 % of whom are historically disadvantaged. The thrust into the rest of the African continent is spearheaded by a recently appointed director, Jonathan Horn.

The chief executive officer of Kwezi V3, Francois Jacobs, says the BEE partnership has been a recipe for success for Kwezi V3.

'Since embarking on our partnership with the Kwezi Group in 2001, we have seen annual turnover rise by more than 40 % to top R200 million and assets have increased by 30 %. Our board plays an active role in providing strategic direction to the company and in seeking new business opportunities. In addition to Kwezi's involvement at the operational and strategic levels, Kwezi assists our recruitment efforts through its access to a highly qualified pool of previously disadvantaged individuals. Such assistance is critical for the sustainability of our growth.'

Jacobs says that 70 % of the consultancy's training budget is spent on developing previously disadvantaged employees.

Mahamba says that with the increased BEE shareholding, Kwezi V3 plans to accelerate and catalyse transformation across all tiers of management. To expedite this process, Loyiso Toyi, a director of Kwezi V3, has been appointed chief operating officer to champion growth and transformation.

Mahamba says that in addition to participating in local infrastructure projects, international growth is a central strategic objective to Kwezi V3.

'Kwezi V3 Engineers intends to develop a significant presence and design capabilities in certain strategic African countries and the United Arab Emirates. In Angola and Tanzania, joint ventures with other consulting engineers have already been established. To this end, negotiations have commenced in earnest with consultants and business leaders in the Congo, Namibia, Kenya and Senegal, to establish locally based companies, joint ventures or strategic alliances.'

Kwezi V3's contribution to the growth of the South African economy and job creation has earned the company a nomination from the Department of Trade and Industry as one of South Africa's Top 300 companies in 2004.

Francois Jacobs

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Siphoh Mahamba

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SAICE AND PROFESSIONAL NEWS

Inconsistency of procurement policies revealed

THE SOUTH AFRICAN ASSOCIATION of Consulting Engineers (SAACE) has for some time been receiving reports of inconsistency in terms of procurement policies and this was highlighted by member firms in their responses to their management information survey (MIS) results to June 2004.

Says Graham Pirie, chief executive officer of SAACE: 'Lack of coordination at provincial and local government in terms of procurement policy implementation has hampered confidence in the industry, while inadequate communication of procurement policies is leading to great confusion during tender adjudication procedures.'

'Some member firms working with district municipalities have reported that each has instituted its own procurement policy which include set asides often focusing exclusively on HDI ownership. Such policies are not in line with the national government policy or procurement best practice.'

'In many instances set asides are put in place which are difficult or impossible to satisfy with the present availability of qualified black professionals within the consulting sector. This gives rise to the unhealthy and unacceptable practice of fronting which is bedevilling the construction industry.'

In addressing the economic climate within the construction industry, the MIS confirms an upswing trend that is supported by the fact that real fee income rose by 7 % in the first half of 2004 to June compared to the last six months of 2003.

This is the strongest increase since the June 2001 survey and was in line with expectations. Pirie says that this translated into a real annual increase of 2 % over the period under review.

The survey further reports that competi-

tion in tendering remains very keen to fierce and companies are reporting that profit margins are under pressure. This can be attributed to the increased rate of employment, which rose by 2 % in the first six months of 2004 as well as an increase in labour costs, which increased by an annual rate of 35 %.

Says Pirie: 'These results confirm the shortage of experienced professionals, which is leading firms to pay higher salaries in order to attract and retain skilled staff. The expected economic growth as well as the country's increased infrastructural demands should continue to affect engineering capacity.'

'As a result, the industry is running at dangerously high capacity levels. The majority of firms are reporting capacity utilisations of 90 % or more at June 2004, but even at these high rates, firms are expecting utilisation to increase further.'

'With the amount of money still available for investment during the next three to five years, according to the government's three-year medium-term expenditure framework, conditions in the industry are expected to become much more strenuous, and as a result only 3 % of respondents felt that utilisation might decline.'

High utilisation leaves little room for further increases, and this will have a negative impact on training, particularly in-house training and could represent a major threat to training and mentoring within the industry.

Says Pirie: 'And, at a time when as many as 59 % of firms are looking at recruiting more technicians while 55 % are looking at employing more engineers, this raises some concerns.'

'This is not the time for firms to neglect training and mentoring and in a bid to sup-

plement this, the association is putting its efforts behind the Young Professionals Forum (YPF) as a means to provide additional mentoring of young professionals outside the workplace.

'Furthermore, of those intending to increase staff, we are still receiving contradictory reports regarding the shortage of engineers. Some say there is a shortage while others talk of vast numbers of graduates that are unemployed. There may be a shortage of engineers at a specific level (35-45 age group) only, and instead when one hears talk of shortages these should perhaps be seen in terms of affordability.'

'It could be that the industry does need more engineers but cannot afford to employ them, as the fees earned by the firms are too low to allow for increased employment.'

The issue of delayed payments has worsened with 16,6 % of total fee income earned outstanding for more than 90 days, bringing the amount in current prices outstanding up from R652 million to R749 million. Interestingly, payments by the private sector was the poorest and foreign earnings outstanding have increased from 22 % to 24 %.

Concludes Pirie: 'It is heartening to see that transformation of the industry continues to gain ground. This latest survey shows that black employees now represent 26 % of total employment up from 23 % at December 2003. And of particular note is that the number of black engineers taking up prominent positions, such as partners, directors and professional engineers has increased from 5,1 % at December 2003 to a higher 7,5 % at June 2004.'

SAACE 011-463-2022





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RETHINKING GOVERNMENT PROCUREMENT AGREEMENTS

GOVERNMENT PROCUREMENT (GP) in developing countries is estimated to account for 9–20 % of gross domestic product (GDP). GP covers purchases of goods and services by national, provincial or municipal governments and their various agencies from their budgetary resources. GP can also be financed from aid received through bilateral or international aid programmes. The share of GP in national public finances is significant.

Transparency in government procurement was one of the four 'new issues' included in the World Trade Organisation (WTO) at the 1996 Singapore Ministerial Conference. CUTS-CITEE embarked upon a research project on Transparency in Government Procurement (TGP) to address an urgent need for promoting understanding and awareness of TGP issues, particularly in developing countries, not only among civil society but also among policy-makers and trade negotiators. In June 2004 a group of experts were brought together in Jaipur to probe a number of issues surrounding transparency in government procurement. At a brainstorming meeting, it became apparent that there were more fundamental issues relating to government procurement in the context of the WTO's GPA than that of transparency and a fresh look at several aspects of government procurement was warranted.

- In particular, the following was recognised:
- Procurement reform is not about corruption, but about good governance and achieving national development objectives.
 - Although there may be considerable agreement on the ends (efficient, non-corrupt, and transparent procurement systems), remarkably little has been published about the means of attaining them.
 - Very little literature is available to the public on effective and replicable strategies that developing countries have adopted, or could adopt, to improve their public procurement systems.

PROCUREMENT FUNDAMENTALS

Procurement is the process through which contracts are created, managed and fulfilled. It can be documented as a succession of logically related actions that occur or are performed in a definite manner, culminating in the completion of a major deliverable or the attainment of a milestone. Processes in turn are underpinned by methods (a documented, systematically ordered collection of rules or approaches) and procedures (the formal steps to be taken in the performance of a specific task, which may be evoked in the course of a process), which are informed and shaped by the policy of an organisation. Methods and procedures can likewise be documented and linked to processes.

Procurement activities commence once the need for procurement has been identified and end when the transaction has been completed. Six principal activities are associated with the procurement process, namely establishing what is to be procured; deciding on procurement strategies in terms of contract, establishing the pricing and targeting strategy and procurement procedure; soliciting tender offers; evaluating tender offers; awarding the contract; and administering contracts and confirming compliance with requirements.

GOALS FOR PROCUREMENT

Goals associated with government procurement systems relate either to good governance (primary goals) or to the use of procurement to promote social, national agendas and sustainable development objectives (secondary or non-commercial objectives). The goals that are most commonly encountered include competition, integrity (rules of conduct for those engaged in procurement), transparency, efficiency (administrative and transactional efficiency), customer satisfaction, best value (value for money), wealth distribution (support of small business), increased usage of risk avoidance, and uniformity. Procurement systems are increasingly being challenged to address sustainable development objectives, in other words to reduce negative impacts on the environment and contribute to the alleviation of poverty.

Governments establish their procurement systems and policies either explicitly or implicitly around goals. These goals may be used as the point of departure for the development of regulations or may form part of the legislation itself. For example, the Constitution of the Republic of South Africa requires the government procurement system to be fair, equitable, transparent, competitive and cost effective.

ADDRESSING SECONDARY OBJECTIVES IN A PROCUREMENT SYSTEM

Secondary or non-commercial objectives can be categorised in terms of obligations placed on tenderers or successful contractors. Several models for public sector procurement interventions have evolved, based largely on country-specific procurement regimes and requirements.

Concerns regarding the undermining of primary procurement (good governance) objectives are invariably expressed whenever procurement is used as an instrument of socio-economic policy.

A risk assessment was recently performed on the possibility of good governance concerns being compromised when implementing a preferential procurement policy whose objectives can be realised by creating a

demand for services and supplies from – or to secure the participation of – targeted enterprises and targeted labour. This assessment indicates that the methods which relate to preferencing at the short-listing stage and award (tender evaluation) criteria, while not guaranteeing that socio-economic objectives will be met, are those that are least likely to compromise the objectives of a procurement system framed around fair, equitable, transparent, competitive and cost-effective good governance goals.

TRANSPARENCY IN PROCUREMENT

A procurement system is considered transparent if

- the terms in which the procurement process is to be conducted and the criteria upon which any decisions are to be made are properly documented and made widely available
- the eventual procurement award decision – and, where appropriate, any intermediate decisions – is made publicly available, as are the reasons for these decisions, and it is possible to verify that the documented procedures and criteria were applied

A transparent procurement system is characterised by the documentation of clear rules and the means of verifying whether those rules had been followed. A transparent procurement system allows challenges to be made and ruled on in terms of an adjudication procedure which, if upheld, can be readily translated into compensation in the form of reasonable costs associated with the preparation and submission of a tender.

Transparency in procurement can be improved upon through

- capturing key information in an electronic database and using web-based information technology to publish information on procurement opportunities and awards of contracts
- harmonising procurement processes, procedures and methods in a particular country
- standardising procurement documentation, and
- introducing challenge procedures in the form of adjudication where procurement processes, procedures and methods are comprehensively documented

STANDARDISATION

Given that procurement is a process comprising methods and procedures, it is surprising that there are no international or national standards for procurement other than those published recently by Standards South Africa. Standard procurement procedures and methods cannot be developed in isolation from the goals (objectives) that are established for a procurement system. For example, SANS 294,

'Construction Procurement Processes, Procedures and Methods' (2004) provides rules for a procurement system that is fair, equitable, transparent, competitive and cost effective. The qualitative system performance requirements that are implicit in the formulation of these rules are summarised below:

- **Fair:** The process of offer and acceptance is conducted impartially, without bias, providing timeous access to the same information. The system provides for challenge procedures. Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.
- **Equitable:** The only grounds for not awarding a contract to a tenderer who satisfies all the requirements are 'blacklisting', lack of capability or capacity, legal impediments, and conflicts of interest.
- **Transparent:** The procurement process and criteria upon which decisions are to be based are publicised. Decisions (award and intermediate) are made publicly available, together with the reasons for those decisions. It is possible to verify that criteria were applied.
- **Competitive:** The system provides for appropriate levels of competition to ensure cost-effective and best-value outcomes.
- **Cost effective:** The system is standardised with sufficient flexibility to attain best-value outcomes in respect of quality, timing and price, and the minimal resources that are required to effectively manage and control procurement processes.
- **Attainment of secondary (non-commercial) objectives:** The system may incorporate measures to promote objectives associated with a preferential procurement policy, subject to qualified tenderers not being excluded and deliverables of preferencing criteria being measurable, quantifiable and monitored for compliance.

These goals and associated qualitative performance requirements apply to both the public and private sectors. International and national standards developed in terms of annex 3 of the WTO Technical Barriers to Trade Agreement, such as SANS 294, are developed in a transparent manner by the private and public sectors. Accordingly, international and national procurement standards developed in terms of the agreement can be adopted by the public and private sectors.

CONCERNS OF DEVELOPING COUNTRIES

Developing countries are reluctant to accede to WTO procurement agreements for various reasons. These include the negligible benefits of membership; that GPA membership is unnecessary for the development of regional trade; that developed countries are likely to

be the main beneficiaries of developing country membership; and that policy changes are required by GPA membership, particularly those relating to price preference.

MODELS FOR GOVERNMENT PROCUREMENT SYSTEMS

Developing countries may utilise one of several models to regulate their procurement systems:

- **Centralised approach:** Central tender boards or similar organisations oversee the process, evaluate tenders and award contracts.
- **Prescriptive approach:** Legislation and associated regulations detail the procedures to be followed on a decentralised basis.
- Financial instructions establish minimum requirements relating to expenditure and auditing, but do not provide specific instructions regarding the manner in which institutions are to conduct their procurement.
- **Framework approach:** Legislation establishes high-level requirements and leaves it to institutions to provide the detail.

A range of measures can be put in place to deal with corruption. These include:

- Providing independent judicial systems, auditing supervision/management systems, and establishing standard civil servant systems
- Implementing laws relating to access to information
- Conducting ex-post audits of government expenditure, including procurement by the office of the auditor general, and establishing commissions to investigate alleged offences under an Act designed to prevent corruption
- An array of laws relating to corruption, reporting on corrupt practices, establishing the office of a public protector to investigate complaints, promoting access to information, promoting just administration, and protecting those disclosing information relating to corrupt practices

The success or otherwise of all these initiatives is dependent on comprehensive, well-formulated and well-documented procurement procedures being in place that are free from undue discretion and subjectivity. The success rate for prosecutions is low in the absence of such procedures.

A REPLICABLE MODEL FOR PUBLIC PROCUREMENT SYSTEMS

Current practice has been to encourage countries to develop their procurement systems along the lines of the UNCITRAL Model Law on Procurement of Goods, Construction and Services and the World Bank's procurement guidelines (Procurement under IBRD Loans and IDA credits and Selection and Employment of Consultants by World Bank Borrowers). However, it is very difficult to align a country's procurement system with these models and to superimpose

financial and risk management requirements on top of these.

A model to overcome these difficulties has been proposed. In terms of this model

- a national legislative framework should be established to provide the procurement ends and to link the procurement framework to anti-corruption measures and monitoring and auditing requirements
- procurement directives should establish an implementation policy that allocates responsibilities and identifies which of the options provided for below are to be used and under what circumstances
- standard operating procedures are put in place through the adoption of a national standard for procurement, such as SANS 294 or an equivalent international standard, which provides procedures and methods that are consistent with the system's stated objectives

RECENT RESEARCH AND DEVELOPMENTS

The stalemate on launching negotiations on the Singapore Issues at Cancún provides an opportunity to rethink government procurement agreements. In doing so, it should be noted that procurement is not just about obtaining goods and services of an acceptable quality at the lowest price. From a government's perspective value for money does not necessarily mean the lowest price that satisfies requirements. Cost effectiveness needs to be weighed against other social considerations and development interventions. At the same time, transparency is only one aspect of the procurement system and should not be dealt with in isolation.

The IWOGDA report explored new trends in procurement and expanded the knowledge base on aspects of government procurement. The report poses a number of questions that need to be answered, including:

- Is GPA or TGPA an effective reform/development tool for developing countries?
- Are current procurement guidelines appropriate for low- and middle-income countries?
- Is procurement a barrier to trade and, if so, should it be governed by an ISO standard?
- Should procurement be harmonised?
- Does WTO have a role in promoting ethical procurement practices?
- What form of technical assistance and capacity-building should be provided to developing countries?

The answers to these questions may mean that the WTO's procurement agenda may have to change fundamentally.

Summary of a report developed by Ron Watermeyer and presented in draft form at a symposium in Geneva in November 2004. The full report can be downloaded from <http://www.cuts-international.org/tgp.htm>

South African National Standards News

ACCORDING TO SANS 10403, 'Formatting and compilation construction of procurement documents', the scope of work is that document that specifies and describes the works which are to be provided and any other requirements and constraints relating to the manner in which the contract work is to be performed.

Table D.1 of SANS 10403 provides a list of topics that should be considered in the development of the scope of work. It is, however, possible to provide standards that establish generic construction and management requirements which are applicable to a wide range of engineering and construction works and which are independent of contracting and pricing strategies in respect of particular activities.

The SANS 1921 family of standards describe generic construction and management requirements for engineering and construction works. Standards South Africa have now published the first six parts of SANS 1921, 'Construction and management requirements for works contracts'. These standards address the following:

SANS 1921-1:2004 – Part 1: GENERAL ENGINEERING AND CONSTRUCTION WORKS

Establishes generic general construction and management requirements, including planning, programme and method statements; materials, samples and fabrication drawings; site establishment; survey control; temporary works; existing services; health and safety requirements; environmental requirements; alterations, additions, extensions and modifications to existing works; inspection of adjoining properties; and attendance on nominated and selected subcontractors

SANS 1921-2:2004 – Part 2: ACCOMMODATION OF TRAFFIC ON PUBLIC ROADS OCCUPIED BY THE CONTRACTOR

Establishes generic construction, management and maintenance requirements for temporary deviations and detours, barricades and signs, and everything else that is necessary for the safe and easy passage of all public traffic during construction, the defects liability period, and the obliteration of temporary deviations as they become redundant

SANS 1921-3:2004 – Part 3: STRUCTURAL STEELWORK

Contains requirements for managing the fabrication and erection of structural steelwork including responsibilities for design and construction; plan-

ning, programme and method statements; materials, samples and fabrication drawings; quality assurance; drawings, information and calculations; equipment used to construct the works; site establishment; survey control and location of existing works; site operations; existing services; health and safety; environmental requirements; inspection of adjoining properties; and certificate of completion

SANS 1921-4:2004 – Part 4: THIRD-PARTY MANAGEMENT SUPPORT IN WORKS CONTRACTS

Establishes requirements for construction management services, materials management services or a combination of such services in engineering and construction works contracts in which the employer appoints third parties to provide certain resources which a works contractor lacks

SANS 1921-5:2004 – Part 5: EARTHWORKS ACTIVITIES WHICH ARE TO BE PERFORMED BY HAND

Identifies earthworks activities and sub-activities which are performed by hand

SANS 1921-6:2004 – Part 6: HIV/AIDS AWARENESS

Establishes the means by which the risk of HIV spreading between and among construction workers and the local community can be reduced

This family of standards is suitable for use in most contracting strategies, ranging from design by employer to design and build and are generally compatible with the provisions of the Fédération Internationale des Ingénieurs-Conseils (FIDIC) first edition (1999) series of conditions of contract, the Joint Building Contracts Committee's (JBCC) series 2000 agreement, the Institution of Civil Engineer's New Engineering Contract (NEC) system of contracts, and the South African Institution of Civil Engineering's General Conditions of Contract for Construction Works (2004).

The following should be noted:

■ SANS 1921-1 is a synthesis of the construction and management requirements established in the Standardised Specification for Civil Engineering (General) SABS 1200 A:-1986, which was originally prepared by the South African Institution of Civil Engineering, the standard Specifications for Road and Bridge Works for State Roads Authorities (1998) prepared by the Committee of Land Transport Officials,

and the Preliminaries (May 1998) of the Joint Building Contracts Committee. SANS 1921-1 is generic to all engineering and construction works. It allows the employer to allocate responsibilities for design in any one of three contracting strategies.

■ SANS 1921-2 is based on the provisions of the standard Specifications for Road and Bridge Works for State Roads Authorities (1998) prepared by the Committee of Land Transport Officials.

■ SANS 1921-3 may be used in either main contracts or subcontracts to describe the construction and management requirements for steelwork.

■ SANS 1921-4 may be used to describe the scope of work for the third-party management support in a service contract or an engineering and construction works contract.

■ SANS 1921-5 replaces the generic labour-intensive specification provided in the Department of Public Works' Guidelines for the Implementation of Labour-Intensive Infrastructure Projects under the Expanded Public Works Programme (EPWP).

■ Research indicates that the South African construction industry has the third highest incidence of HIV/Aids in South Africa. The construction sector has a predominantly migratory labour force, making it a prime contributor to the spread of HIV/Aids. Labour camps are a breeding ground for the spread of HIV/Aids and Sexually Transmitted Diseases (STDs), this being compounded by the situation where migrant workers on contract generally avoid or are ignorant of the consequences of casual sexual relationships. SANS 1921-6 has been developed together with the CIDB to address this situation.

All or any of the parts of SANS 1921 can be ordered from SAICE National Office by using any of the following options:

Phone Angelene at 011-805-5947

E-mail aaylward@saice.org.za

Fax Angelene at 011-805-5971

Download order forms from the SAICE website www.civils.org.za

Visit the SAICE shop at the National Office

At very reasonable cost we can also dispatch by courier or overnight mail

New Fellows



CHRIS ATKINS matriculated at Rondebosch Boys' High School in 1965 and graduated with a BSc Engineering degree from UCT in 1971. He joined the Engineering Department of the Cape Divisional Council, and has remained in

the employment of the same local government organisation for the past 32 years, obtaining the position of chief engineer: roads prior to the restructuring of local government in the Cape Metropole. A major portion of his earlier work related to the planning, design, project management and implementation of a number of important roads and bridge projects throughout the surrounding areas of Cape Town. Latterly, he has occupied the position of route manager in the Infrastructure Management Branch of the City of Cape Town where his duties include the co-ordination of road infrastructure matters and policy development.



KEITH BOKELMAN graduated with an Hon BEng (Civil) (Cum Laude) degree from the University of Stellenbosch in 1977. After completion of his military training, he joined Africon (then Van Wyk & Louw) in Pretoria in the

structural section. In 1981 he obtained the degree MEng (Struct) (cum laude) from the University of Stellenbosch. In 1990 he was transferred to the Cape Town office of Africon. In the same year he was appointed a director of Africon, responsible for the structural work undertaken by the firm in the Western Cape. He obtained an MBA from UCT in 1995. Today he is still responsible for Africon's structural work in the Western Cape, but is also actively involved in their expansion into the Middle East.



VICTOR BOOTH has a master's degree in engineering and has worked in the construction industry for 41 years with contractors, project managers and consulting engineers. He has wide-ranging experience in the design and construction of concrete, steel, masonry and timber structures. He is an acknowledged expert in the structural use of timber and was chairman of the Institute for Timber Construction

(ITC) from 1991 to 1995. Victor is a past chairman of the Joint Structural Division (1999 & 2000) and is an active member of many SABS code and specification development committees. He is a consulting structural engineer in general practice as well as specialising in timber structures, forensic/investigative engineering and mediation/arbitration services.



DAVID BUDLER graduated from the University of Natal in 1978. He began his career with the SAR & H and has worked in the fields of engineering design and maintenance, strategic planning and general management, in various

capacities in both the port and railway environments. He has been involved in various major business development projects. A seven-year stint in Spoornt's export coal business unit, COALink, saw him responsible for the planning to raise the rail capacity of the coal line from 67 to 86 million tonnes per annum. He is currently involved in the development of major projects for Spoornt's business division. He holds an honours degree in construction project management from the University of Pretoria and an MBL (cum laude) from Unisa.



GAVIN BYRNE graduated in 1972 with a BSc in Civil Engineering. He concentrated on materials and structural engineering at Ove Arup & Partners until 1980 and specialised in geotechnical engineering as an

associate partner until 1987. Gavin joined Franki Africa in 1987 as a senior design engineer and is at present technical director of Franki Africa (Pty) Limited. Has had wide involvement in both deep and shallow foundation engineering, marine structures, lateral support, slope stability, soil improvement and site investigation and evaluation. He has been involved with the design and construction of many projects in southern, Central, East and West Africa, as well as the Indian Ocean Islands, for over 15 years. In 1988 he received the Jennings Award for his contribution to the design of a raft foundation for a large hotel complex in Durban and in 1999 the Basil Read Award for his outstanding contribution to the civil engineering construction industry. He initiated and co-authored

the well-known third edition to the Franki book *A guide to practical geotechnical engineering in southern Africa*. He has recently been awarded the Geotechnical Gold Medal by SAICE for his extraordinary and sustained contribution to geotechnical engineering in southern Africa. His main claim to fame is being the brother of the chief design engineer at the very successful Ferrari F1 team.



HENRY (DUTCH) DIESVELD graduated from UCT in 1963 and joined Van Niekerk Kleyn & Edwards (now Vela VKE) in 1964 as a bridge design engineer in Cape Town until 1970. This period included 18 months as a resi-

dent engineer in Port Elizabeth and seven months constructing various military facilities for the SA Engineering Corps. From 1970 to 1976 he was the resident engineer on three projects in Cathcart, King Williams Town and East London before returning to Cape Town, where he has been acting as the contracts engineer on numerous civil engineering contracts, the major ones being the Huguenot Tunnel project between 1978 and 1988 and various incrementally launched bridges.



TON FIJEN was born in Holland and obtained an MSc degree in Civil Engineering (Hydraulics) from Delft University of Technology. After one year in the Middle East and two years in Australia, he moved to South Africa.

In South Africa, he worked for SRK, the CSIR and GFJ Consulting Engineers. Ton is at present a director with Entech Consultants in Stellenbosch and is responsible for coastal engineering and waste management projects. He specialises in hydraulics and marine environmental and marine water quality studies, and is the responsible design engineer for the dredging works at the new Coega harbour.



TONY GATES matriculated in 1970 and joined B S Bergman and Partners in 1973 as a trainee technician. He graduated from the Cape Technikon in 1976 and transferred for two years to Liberia, where he was involved

in a number of large infrastructure projects. In 1987 he completed the requirements for professional engineer status at the University of Cape Town and developed an interest in water and wastewater treatment, studying towards an MSc in Water Engineering at UCT, and waste management. He is currently head of the Solid Waste Management Division for Ingerop Africa (formerly BSB&P). Tony's involvement in projects include the development of an integrated waste management plan for Cape Town and the Knysna Waste-by-Rail project. He served on the Western Cape Committee of WISA between 1995 and 1997 and is an external moderator for the Peninsula Technikon.



COLIN HALL obtained a BSc Civil Eng from UCT in 1973 and a BCom from Unisa in 1993. He started his career with Murray and Stewart as a site engineer on the Foreshore Freeways and later joined Kantey and Templer

Consulting Engineers, focusing on major truck road projects and township services including the Belhar and Mitchell's Plain developments. He is currently employed by the City of Cape Town and is responsible for the preparation of the capital budget, strategic planning and the management of capital projects for the Solid Waste Disposal Department. This has included the development of lined waste disposal cells at the city's major landfill sites, progressive closure, and rehabilitation of these sites as well as the planning and development of a number of modern transfer stations. He has been closely involved in the identification of a regional landfill site for the City, the implementation of the first Leachate Treatment Plant in South Africa, and the preparation of an integrated waste management plan for Cape Town's Solid Waste Service.



W F HARTLEY graduated with a BSc in Civil Engineering in 1964 from Queens University Belfast and joined the roads department of the local council. He emigrated to South Africa in 1970 to join the geotechnical division of

Ove Arup and in 1973 moved to the piling and drilling contracting business of McLaren & Eger in Johannesburg. He re-located to Alberta, Canada, in 1981 to join Deep Foundations Contractors in Calgary and returned to sunny South Africa and McLaren & Eger in 1984. In 1987 he joined Ground Engineering as technical manager in the geotechnical contracting business, offering a broad spectrum of services such as piling, anchoring and grouting to the civil engineering industry.



AMBALAVANAN MOGANNA (ALI) NAIDU was born in 1961 in Durban. He obtained a BSc (Civ) Eng from Natal University in 1984 and a GDE (Project Management) from the University of the Witwatersrand in

1993. On leaving university Ali joined the Department of Water Affairs and Forestry from where he gravitated to van Wyk & Louw (Africon) in 1987. Here he was mainly involved in the structural engineering environment, specialising in industrial and commercial structures. Ali left VW&L in 1990 to join SA Breweries where he was responsible for the project management of several large multi-disciplinary projects. He joined P D Naidoo & Associates in 1994. Ali is at present the CEO of P D Naidoo and Associates and is based in the Johannesburg office of PDNA. He is married to Sarmashni and they have a baby daughter, Kaira.



JOHN C HULME was born in Cape Town in 1956 and matriculated at Grey College in 1972. He graduated from UCT with a BSc in Civil Engineering in 1977. His postgraduate studies included a Graduate Diploma in

Engineering (UCT) in 1982 and an MDP PM (Unisa) in 1985. He is a fellow member of the Association of Arbitration. He worked for the Department of Water Affairs from 1980 to 1983 and subsequently joined De Villiers & Hulme Consulting Engineers, of which he is a founder partner. He has a special interest in wineries and wine cellars. Other interests include golf, running, and scuba diving.



ANDRIES JOUBERT graduated from the University of Pretoria in 1985 with a BSc Civil Engineering degree. In 1986 he started working in the road design section of Keeve Steyn and Partners. He joined Jeffares & Green

in 1985, and became involved in the PWV Consortium's work in modelling, planning and updating the Gauteng Strategic Major Road Network. He obtained an MEng (Transportation) degree from UP in 1995 and is currently a director in the Johannesburg office of TTT Africa.



HANRÉ STREICHER graduated from the University of Stellenbosch with a BEng in 1981 and immediately commenced work with Sippel & Schumann. He then joined GFJ, where he spent five years in the structures and

civil sections. In 1987 he obtained an MBA from the University of Stellenbosch and in 1989 co-founded the partnership Geustyn Loubser Streicher (GLS). He is currently a director of GLS, specialising in master planning of existing water and sewer reticulation systems.



JOHAN VERWEY matrikuleer in 1975 aan die Hoërskool Cradock en behaal in 1979 die BIng-graad aan US. Nadat hy in 1980 die graad BSc Hons (Hidrologie) aan UOVs verwerf, begin hy sy professionele loop-

baan by die Departement van Waterwese as eerste ingenieur in die streekkantoor op Cradock, waar hy betrokke is by verskeie aspekte van besproeiingskemas/-stelsels. In 1985 word hy oorgeplaas na die Konstruksiedirekoraat as ter-reinigenieur op die De Mistkraaldam-projek. Daarna behaal hy die MBA-graad (cum laude) aan US Bestuurskool en sluit aan by Asla Konstruksie as terreinagent. Hy is betrokke by verskeie projekte voordat hy in 1991 beheer neem van die tenderafdeling in Asla Konstruksie. Hy is sedert 1993 direkteur in die Asla Groep van maatskappye wat betrokke is by verskeie siviele konstruksie-dissiplines asook laekostebehuising en eiendomsontwikkeling.



MIKE VAN WIERINGEN (PrEng; PrSciNat) matriculated from Thomas More College in Natal in 1968. He obtained a BSc (Civ Eng) in 1973 and an MSc (Civ Eng) in 1976 from Natal University Durban followed by a

BSc (Geology) in 1981 from the University of Cape Town. He has worked for various consulting firms in Durban, Cape Town and New Zealand, primarily in the fields of geotechnical engineering and engineering geology, interspersed with a four-year period as a lecturer in soil mechanics and engineering geology at UCT. In 1988 he founded the firm of M van Wieringen and Associates in Cape Town, consulting in the fields of geotechnical engineering and engineering geology to a wide range of clients. His chief interest and expertise lie in the interrelationship and integration of the technical fields of geotechnical engineering and the natural sciences such as geology, geohydrology, climatology, and botany. His recreational interests include mountaineering, kayaking, diving and rock climbing.



ALLAN WIJNBERG has been involved in coastal engineering work since graduating in 1982. He commenced work with the Atomic Energy Corporation where he specialised in the coastal engineering aspects

relating to nuclear power stations, notably quantitative risk assessment for site and plant qualification. In 1990 he formed the consulting practice A R Wijnberg Inc, operating in the field of port, coastal and environmental engineering. The firm was responsible for a number of projects, including Port St Francis harbour, Mossel Bay marina, two sub-marine pipelines, Victoria Bay and St Francis Bay beach rehabilitation, and numerous environmental impact studies. A R Wijnberg Inc merged with WPR in 1996 to form Prestedge Retief Dresner Wijnberg (PRDW). Allan is involved in port and coastal engineering. Current projects include lead engineering consultant on the new port of Ngqura, the design of the new Durban harbour entrance, and port studies for the Corridor Sands Heavy Minerals Project, Mozambique and the port of Iquique, Chile. □

SAICE Events February--September 2005

TOPIC	DAYS	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPTEMBER	PRESENTER	CONTACT	VENUE
Brunel Lecture	Half	10								John Banyard - ICE	llamani@saice.org.za	Rand Water
Business Finances for Built Environment Professionals	2		23-24 GT			9-10 GT				Wolf Weidemann	llamani@saice.org.za	SAICE
	2		1-2 PE							Keith Mackie	llamani@saice.org.za	SAICE
	2		3-4 George							Keith Mackie	llamani@saice.org.za	SAICE
	2		7-8 Dbn							Keith Mackie	llamani@saice.org.za	SAICE
	2		10-11Jhb							Keith Mackie	llamani@saice.org.za	SAICE
	2		17-18 CT							Keith Mackie	llamani@saice.org.za	SAICE
	5			23-27 Dbn							cdejaeger@saice.org.za	ICC, Durban
ECOSAN 3rd International Conference on Ecological Sanitation	2						13-14 GT			Duard Barnard	llamani@saice.org.za	SAICE
Obtaining Environmental Authorisation: A Strategy	2			14-15 GT			4-5 GT			Wolf Weidemann	llamani@saice.org.za	SAICE
Handling Projects in a Consulting Engineer's Practice	3	1-3 GT									svs@ing.rau.ac.za	University of JHB (RAU)
Hydraulic Modelling	2							25-26GT		Karl von Buddenbruk	llamani@saice.org.za	SAICE
Negotiation Skills	Half							3-31 GT	7-28 GT	Various experts	llamani@saice.org.za	SAICE
SAICE/Wits/Pretoria Afternoon Lecture Course	4				10-13 CT						llamani@saice.org.za	CT Convention Centre
SASITS Conference 2005	2						4-5 CT			Karl von Buddenbruk	llamani@saice.org.za	SAICE
Technical Report Writing	2		1-2 GT				13-14 GT			Karl von Buddenbruk	llamani@saice.org.za	SAICE
Vaalco Conference	2		10-11 Dbn						19-20 Mmnd		llamani@saice.org.za	Midrand
X-Perf Proactive Project Management and Planning	4									Andre Nortier	llamani@saice.org.za	Centurion
Young Geotechnical Engineers & Practitioners YGE 2005	3					13-15				Nico Vermeulen	stephenson@ebe.wits.ac.za	Mpumalanga

CT = Cape Town; Dbn = Durban; EC = Eastern Cape; EL = East London; FS = Free State; GT = Gauteng
Jhb = Johannesburg; Mmnd = Midrand; PE = Port Elizabeth; Pta = Pretoria; TBA = To be announced

Please contact Lungelwa Lamani for course fees and more information on course content: Tel 011-805-5947/48/53

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