

ENERGYS to the rescue

Aerospace engineer Theodore von Karman expressed himself wisely: 'Scientists discover the world that exists; engineers create the world that never was.' Over the past 14 months, engineers young and old have been building municipal infrastructure that never was throughout South Africa!

THE ENGINE behind this accomplishment has been the ENERGYS (Engineers Now to Ensure Roll-out by Growing Young Skills) programme, which was initiated in February 2006 to address needs identified in the SAICE publication *Numbers and Needs*, compiled by Allyson Lawless.

The most compelling challenges identified were:

- A shortage of qualified civil engineering professionals in municipalities country-wide
- Many student technicians are unable to obtain experiential training or employment after graduating, because there is insufficient capacity to manage and train young professionals

The ENERGYS programme, of which the start-up phase drew to a close on 31 March 2007, encompasses the deployment of retired engineers, paired with students and unemployed graduates, in local authorities to unblock existing bottlenecks, while at the same time offering comprehensive training to those students and graduates. To date 56 senior engineers, 45 graduates and 99 students have been deployed in 76 local and district municipalities countrywide, augmenting the technical structures or filling core positions in the absence of technical staff. (See box on page 53.)

SAICE in partnership with SABBACO (South African Black Technical & Allied Careers Organisation) are managing the programme, while funding has been provided by the National Department of Local Government, the Department of Water Affairs and Forestry, and the Gauteng and Northwest departments of Local Government. Another key contributor has been the Local Government Sector Education and Training Authority (LGSETA), which provide stipends for experiential training, enabling students to ultimately obtain their national diplomas.

PROJECT TARGETS

The targets and goals of the ENERGYS programme over the past months have varied from municipality to municipality, but the main objectives remain the following:

- **Improve service delivery through:**
 - Accelerating the delivery of MIG (Municipal Infrastructure Grant) projects, where funds are often reported as being unspent by the end of the financial year
 - Planning, initiating and/or delivering capital projects
 - Rehabilitating services which have suffered operations and maintenance neglect over time
 - Effecting sustainable savings by curbing losses
 - Revenue enhancement by installing meters, addressing illegal connections and checking tariffs on all major accounts
- **Grow technical capacity through training, mentoring and coaching of in-house staff, students and graduates:**
 - More than 130 in-house staff have been trained in, inter alia, project management, expanded public works programmes, CAD (computer-assisted drawing) and design
 - Students and graduates have been successfully exposed to a range of disciplines such as administration, planning, design, survey, drawing up contracts, construction, material testing, and operations and maintenance, in compliance with the requirements of the South African universities of technology and ECSA. Since these disciplines are all found in local government, students and graduates have gained unique and holistic experience in the workplace

SUCCESS RATE

Both large and small projects have been handled by the teams of senior engineers, students and graduates. They have been

instrumental in delivering bulk infrastructure, undertaking operations and maintenance – with many students accepting the responsibility to operate treatment works in the absence of trained staff – developing solid waste sites, building houses and amenities, and carrying out infrastructure audits in order to draw up backlog reports.

These activities were in support of the list of deliverables defined at the outset of the ENERGYS programme, which singled out the timely delivery of MIG projects, the planning and delivery of capital projects, rehabilitation of services, curbing losses, and enhancing revenue as of crucial importance. In many provinces the list of deliverables was extended to include updating organograms to appoint more technical staff where required, developing job specifications and interviewing and populating structures, and carrying out backlog studies in terms of the need for both new basic services and rehabilitating failing or failed services.

Of the more than 650 projects to the value of just over R2 billion that had been identified as requiring attention or management, some R500 million has been spent and R200 million worth of projects have been completed by the teams in the 12-month period to February 2007.

SINGULAR ACHIEVEMENTS

- In Ugu district municipality (DM) in KwaZulu-Natal, details of 19 sewerage and water treatment plants had been lost over time, preventing essential refurbishment. The eight students deployed there, not only operated but surveyed, sketched and developed operating procedures for each of the plants. These students are now able to train new operators as they are appointed as part of the district's human resources development programme. One of the students, Zotha Cele, considered it to have been 'a great opportunity in terms of in-service training, which does not come by easily, and learning the in-and-outs of becoming a future civil engineer'.
- In Zululand DM, 12 young civil engineering technicians who had limited experience or mentoring in the workplace, asked the senior engineer deployed, Brad Rutherford, to develop a training programme that covered all aspects of

Appeal to Senior Civil Engineering Professionals ...

I am delighted to be able to report that the ENERGYS project is set to continue. To date we have employed 56 mostly retired engineers, 99 students and 45 graduates who are collectively tackling almost R2 billion worth of projects in local government! Spending is taking place and the young people are progressing well.

In Gauteng the project has been extended to March 2008, elsewhere to September 2007, and in selected areas for two to three years!

We are therefore looking for more available or retired, but energetic engineers willing to work in the following centres:

- **Eastern Cape** We currently do not have specific requests from local government here, but there is so much to be done, if you are living in an outlying area, let us know as we can possibly link you up with the local municipality
- **Gauteng West Rand, Emfuleni (Vereeniging) and Ekurhuleni** – for that matter, most areas could do with one or two more pairs of hands, so let

us know wherever you are!

- **KZN** Zululand centred around Ulundi, Amajuba centred around Newcastle, Sisonke (East Griqualand), Impendle, Pongola and Umhlatuze (Richards Bay)
- **Limpopo** Groblersdal, Marble Hall, Lebowaqgomo and Thohoyandou
- **Mpumalanga** Bushbuckridge, Lekwa (Standerton), Dipaleseng (Balfour) and the districts of Nkangala and Ehlanzeni
- **Northern Cape** Kimberley, Kuruman, Springbok, Upington and De Aar – we really need people in these vast areas!
- **North West** All over!
- **Western Cape** Eden District, centred around George, is in desperate need of a mentor to supervise their road gravelling teams. The senior who has just left did a brilliant job mentoring the concreting teams who carried out the flood damage repairs on stormwater structures. Now Eden is anxious to see a similar improvement in

their gravelling projects

All the appointments would entail resolving bottlenecks as well as supervising and training young civil engineering student and graduate technicians. Attractive contracts are being offered for those with the passion to make a difference in the development of young people and delivery in local government.

Another national imperative is the need for lecturers. There has been recognition of the need to increase throughput in all engineering degrees and diplomas, which will require an increase in teaching staff. If you are based in a centre with a civil engineering faculty and are interested in full or part-time lecturing, send your CV please!

Let's hear from you all – you collectively have so much knowledge to share!

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municipal engineering. Brad threw all his energies into drawing up a refresher course that included general management, surveying, hydraulics, pipelines, water distribution and losses, roads, structures, project management, fleet management, and materials. After completing the course the students designed and drew small water supply systems and have become involved in water demand management. The response from the Zululand DM was: 'We believe this project should definitely be continued and run for a period of at least three years.'

- In the Karoo DM, which serves a sparsely populated area of 102 592 km² that is difficult to service or maintain and where unemployment in rural communities is high, Christian Schumann has come up with very creative approaches to road and stormwater maintenance. He relates how Hans from Petrusville benefited from the SMME development programme, which was key to Christian's work: 'A local farmer, Jacques, who grew up with Hans, introduced him to me for the job of clearing the reserve of a section of the road between Colesberg and Petrusville, where the thick thorn trees contributed to storm damage to the road during heavy rains. Jacques, an agricultural economist, helped Hans – who is illiterate, but has a bakkie, a cell phone and a bank account – to prepare a quote, and Hans and his team of workers were awarded a two-month contract. They completed the job in three weeks to high standards and Hans was paid according to his quote, which enabled him to feed his family. It also paved the way for him to enter into future contracts for other

similar work in the area.'

- At the Kungwini local municipality (LM) in Gauteng, senior electrical engineer Thys Human and his team remedied a situation where electricity was sold to large clients at a much lower rate than it was being purchased for from Eskom. Accounts were corrected, which resulted in an immediate financial benefit of over R2 million. Another redress was billing large consumers who had escaped the net in the past, leading to an increased income of about R270 000 per year for the municipality.
- Russell Motlatsi reports from the Randfontein LM that in the task schedule drawn up for him by his senior engineer, the norms of responsibility,

trust, accountability, a positive attitude, discipline, honesty, productivity and good communication in fulfilling his task as technician/technologist were accentuated. He concludes: 'Mentoring is of vital importance in this programme as acquiring the appropriate skills in the profession is fundamental.'

- Caroline Maphanda, one of a group of female students who helped build RDP houses in Orange Farm, Gauteng as part of the Women's Build 2006 project, reports from Randfontein LM how they had to do the plastering, painting and roofing on the house that was allocated to them. Their senior, Leonard le Roux, 'taught

► Below: Russell Motlatsi on the job





▶ Left: The plastering team at Orange Farm

encountered and have added regular site visits to their training, after which protégés have been expected to carry out research and write reports addressing a difficult issue encountered on site. With this level of involvement many of the students and graduates have progressed in leaps and bounds.

A MODEL FOR THE INDUSTRY

The discovery and development of talent in this project has been very rewarding for many of the senior engineers. Research carried out when preparing *Numbers and Needs* showed that experienced staff are working 70 hours a week and more and have no time to train young people, and that young people cannot get experiential opportunities or employment as all posts call for applicants to have five years experience or more! The only way this gap is going to be addressed is to bring retired staff back into industry to act as dedicated supervisors for students and young graduates. Industry has long complained about the quality and the lack of career readiness of students and graduates, but most seniors forget that they too were not very effective when they first entered the job market. This project has proven beyond a shadow of a doubt, that if sufficient attention and guidance is given to these young people they can participate in projects in a meaningful way and start to carry some load to assist those who are overloaded.

The model is one that should be harnessed by all companies to grow the new generation of civil engineering professionals. □

us a lot about what was wrong with the house design so that we will know what to look out for in future. I learned that building is not all about having completed the job, but also thinking about the people that will be using the structure on a daily basis ... I hope to see this as a continued practice in future ...'

- At Prince Albert LM, graduate Ashley America, under the mentorship of Peter de Villiers, did the planning and design of the repair work needed to restore services and infrastructure which had been flood-damaged in 2006. After having assessed the damage, he recommended that a gabion structure be constructed as protection for the water treatment works against future floods, and the river crossing bridge be rebuilt by hand packing small rocks below the bridge deck and pumping cement mortar between the voids. 'I am steadily developing as a technologist and acquiring the appropriate skills for my chosen profession. This is largely due to my involvement

with the ENERGYS project and the mentorship.'

- At Eden DM in the George area, Michael Xelani was involved in beautifying the Swartvlei caravan park. He was given the opportunity to do surveys and cost estimates for the whole project, and phone contractors for prices. He says that under the guidance of Mr Gunther Erhardt he has gained more self-confidence and that his communication skills have improved. 'I believe that working with municipalities is a good opportunity for civil engineering graduates who are still new in the industry and a great experience for trainee students. I really appreciate the ENERGYS team for providing this project and wish that it may continue for future civil engineering students.'

Senior engineers, on realising the limited understanding many of their protégés had of several engineering disciplines, took it upon themselves to become teachers and lecturers. They also took time to explain to their charges what to do when problems are

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