

An African Engineer's View



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Presidential Address 2010

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About Ali Naidu

Ali Naidu is the CEO of PD Naidoo and Associates and based in the Johannesburg office. He obtained a BSc Eng degree from the University of Natal and in 1993, he graduated with a post-graduate degree, specializing in Project Management. As a graduate engineer, he gained knowledge in the water supply field during time spent in the Department of Water Affairs planning section. He then moved on to design access roads for the Katse Dam project under the guidance of experienced engineers of Van Wyk & Louw (Africon). The next few years were spent in the structural engineering environment where he specialized in industrial and commercial structures, predominantly in steelwork. He spent several years with South African Breweries in the Engineering and Projects Division, where he was responsible for project management of several large multi-disciplinary projects.

Upon joining PD Naidoo & Associates, he took the role of Managing Director, the technical focus of the business being his primary responsibility. He's been involved in projects encompassing the provision of basic infrastructure, design and management of various structural projects, design and management of infrastructure works including rural water schemes. He currently leads the Ilembe Engineering Joint Venture, engineers on the King Shaka Intl Airport.

He is currently Group CEO of PDNA Holdings Group, serves on boards of PDNA Consulting Engineers, PDNA Industrial Projects, PDNA International, PDNA Investments, Sage Computer Technologies (Chairman) and PDNA Properties (Chairman).

THE AFRICAN ENGINEER'S VIEW

In a world that suffers from huge disparities due to varying degrees of progress in developing and developed countries, it is often the case that the "haves" tend to have a louder voice than the "have-nots". The African engineer therefore is often not heard or does not have the platform to speak of his wants and needs.

Good evening distinguished guests. In trying to come up with a theme for my presidential year I decided to look at my predecessors and consider their views, thoughts and philosophies. All of them were noble people who showed humility and, characteristic of engineers put the wellbeing of society and its inhabitants first, before their own needs.

This is typical of an engineer - his need to be of value to others is the hallmark of his quest for fulfillment. This is what I would want to articulate this evening - harnessing the value in this ethos in relation to its relevance closer to home, and specifically in AFRICA. The evolution and growth of the African engineer is unique and different from that of our counterparts of the developed world.

Africa has always been the focus of the world's attention – its mystique, natural beauty, and of course its wealth in minerals and metals, amongst others, presented lucrative opportunities for the developed world's quest for wealth and territorial ownership and with this the influx of many new visitors to Africa. This attention brought new cultures, diverse needs and new thinking, and is reflected by the urbanisation within the African landscape. This wave of interest resulted in the beginning of influences and the setting in of the western world and its cultures, including the introduction of other religious beliefs. The African coastline underwent dramatic change through colonisation by many European nations, mainly from the French, Portuguese, Spanish, and English speaking countries.

The world's great industrialisation process brought about huge energy demands, and natural resources such as coal, oil and gas became increasingly a commodity that Africa provided in abundance. Africa's own growth, spurred by its need to provide basic humanitarian support and services for its people, demanded a response for its own industrialisation. All of this demanded and dictated the need to build Africa's engineering capacity and skills base. Where to begin was the question, and this question still plagues us. In developing Africa, many engineers are employed or engaged in delivering projects for multi-national companies that are primarily focused on extraction and beneficiation of mineral resources. In the past these were built largely around available



materials and technology appropriate for local sustainability and taking cognizance of prevailing local by-laws and regulations. With the advent of many advanced technology efficient processes, understandably, it is increasing a drive to build to new standards. The skill set required for industrial chemical process dominated developments is different to that required for long-term infrastructure development addressing socio-economic needs, health provision, basic water and sanitation, and education. Neglect here is obvious because of non-immediate economic benefit. In developing countries in Africa, the primary factor in technology choice for new infrastructure must not only be driven by sustainability issues. The choice of newer technology versus conventional design must be examined. It often leads to other immediate benefits that benefits short-term goals such as poverty alleviation, health and safety. The choice of conventional design which subscribes to job creation may not subscribe to sustainable solutions. A balance must be sought!!

Africa was in the past, and still is, highly dependent on specialist external sources for many technical engineering skills. Our Academia provided our governments trusted advice for future planning on infrastructure. The actual implementation of such plans was performed by external engineers and capacity. The lack of a functional grassroots education system made it impossible to develop engineering skills. Therefore, the opportunity to nurture more engineers, train our builders, and develop artisans to operate and maintain our industrial plants was not possible. Africa became highly dependent, and in some cases almost beholden, to external resources to provide life-long support for these plants.

The eyes of Africa's engineer see his world differently from visitors. He sees the needs and desires of the people. Basic services are what this continent demands, and much of this is dependent on the availability of financial and economic resources. The African engineer has to skill up, whilst he is challenged with the lack of suitable feed stock from grass roots. He has to develop capacity and skills. He has to operate and manage at the business corporate level. At the same time,

address non-engineering considerations and advise government on infrastructure and industrial plans. He has to be socially and morally conscious of his obligation to serve his people without compromise.

Why have I been rambling on about the African engineer's uniqueness? Because many of the functional requirements that he has to consider when engaging in infrastructure development are different from those of his western counterpart:

- Life preservation - providing nutrition and sustenance versus sustainable development that does not address the immediate life / doom scenario
- Approach to engineering – social engineering versus the pure brick and mortar approach
- Technology utilisation – high-tech versus labour intensive

Whilst we regard South Africa as further progressed in addressing many of these issues, it is our duty to ensure the rest of Africa's progress. So what is the future challenges facing Africa's engineers? What is SAICE's strategic plan in this regard, and how can we align and integrate key imperatives from both perspectives to ensure that these are on our radar screen?

The uniqueness of the African engineer's considerations and priorities should be borne in mind by SAICE as the Institution forges ahead with its future plans.

During the latter half of last year much time was spent in revisiting the principles that SAICE's strategic plan should be embracing. These are issues of present and future relevance. One of the fundamentals that the task team identified was the cornerstone that inspired the formation of SAICE, namely that the Institution as a body is able to achieve more than individual members or small groups to address the needs, desires and concerns of its members. The team went further to understand the common threads that have been running through the organisation throughout its existence, with some of the key ones being the following:



- Technological leadership
- Development and maintenance of civil engineering skills
- Civil engineering as a leading profession
- Increase in membership and funding of SAICE
- The need to enhance the image and stature of the civil engineer
- SAICE's contribution to and influence in public sector decision-making, as well as in the formulation of public sector policy
- SAICE's leadership role in civil engineering, including participation in an extensive network of organisations active in the built environment
- SAICE's role in informing society of the value of civil engineering.

The strategic plan is founded on three pillars that capture the golden threads of the past and embrace the cornerstone of the Institution. It looks to the needs of the Institution, environment and society. It is envisaged that these are simple building blocks that will form the basis of subsets or focus areas to be developed. It embodies the call for the engineer to be forthright and virtuous in his position in society.

The **Members Pillar** examines and defines benefits that accrue to individual members and to the members collectively. This is considered paramount as this informs the strategic plan of the fundamental reason for SAICE's existence. SAICE should assist the members to attain career fulfillment and the tools to get there. Career fulfillment is not a destination but a lifelong journey.

- S** Sustainability – the protector
- A** Advisor to society
- I** Innovation – technological advancement
- C** Capacity building
- E** Enabler - integrator

The Environmental Sustainability & Social Responsibility Pillar should focus on the role civil engineering can play to improve the conditions of humankind, strive for betterment of the biophysical environment, or at worst to limit or prevent further deterioration and ensure economic sustainability.

The Institution Relevance Pillar must focus on the long-term viability, relevance and influence of SAICE.

Rather than probe and define the subsets and actions arising from the strategic plan, I intend examining key philosophies that I consider as paramount inclusions in any plan going forward. Using **SAICE** as the acronym makes this easy to remember, as SAICE embodies and embraces these philosophies.

Sustainability

The ever-increasing need for energy has lead to increased levels of CO₂ in the atmosphere; with consequential global and climatic changes this has lead to many natural disasters. Have we ever sat back and visualised what a 2-degree increase in the atmosphere's average temperature means to us? What the meltdown of our cold caps means to the rise in water levels of our coastal regions and the implications for our approach to engineering and design considerations? There are numerous definitions that describe sustainability, but the one I subscribe to and the one engineers can relate to, is: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This definition has been adopted by FIDIC.

"ENGINEERING PLANET FUTURE" is an initiative that SAICE is embarking on as an awareness campaign aimed at engineers, decision-makers, politicians and the public to face up to preparing our future generations to exist harmoniously. Together with our African counterparts we have to look at:

- The processes of sequestration of CO₂ emissions and the capital required
- The lack of legislation governing and promoting low carbon developments and efficient resource usage

■ Technology advancement and research required to ensure sustainability.

Advisor to Society

As a Voluntary Association SAICE has a moral obligation and role to serve society. We are regarded as an organisation without vested financial interests and therefore we are able to purport views that benefit society at large. We have a powerful platform, and we must maintain our moral high ground to ensure that our efforts to promote correct and appropriate policy and legislation are heard and heeded. We should take time ourselves to understand our value to society. We must ensure and explain to all, especially those who are responsible for making key decisions, the value of providing clean water, sanitation, housing and building infrastructure that fulfils the basic human needs. We have to transform the mindsets of others to propagate the right message for all to understand. Just like doctors provide medicine to the sick, we engineers provide the fundamentals of human life: clean water and access to sanitation.

SAICE is embarking on putting out an infrastructure report card again. The previous one in 2006 was received at first by many as criticism of personal performance, but they soon realised that the report card was aimed at informing the public and decision-makers of the condition of our infrastructure. It was an awareness campaign that achieved its goal – namely publicising the facts. The new report card is due for publication in September 2010, i.e. post World Cup 2010, with a report card bulletin being published in April 2010. This is one of the instruments that SAICE will use to spread the message, also among our colleagues in African countries.

Large infrastructure investment is being used as a stimulus to boost ourselves out of the economic recession. A proportion of the government's financial response in addressing the economic downturn is geared towards addressing the failing sectors of our infrastructure. Engineers must avail themselves at all levels of implementation, and ensure that our country's investment is meaningful. Our voice must be heard and heeded.

SAICE will continue to make commentary on key legislation that affects society and the ability of our members to perform their work. Our engagement at ministerial level is being welcomed, and government has constructively embraced the idea of private sector input. SAICE will continue to engage and strengthen the debate on key imperatives for our Institution.

Innovation

Creation of technology to meet future demands cannot be done in isolation and therefore global collaboration is essential to pool our combined resources to address this issue. Our northern hemisphere counterparts have historically been better equipped to examine futuristic demands that are placed on our diminishing non-replenishable natural resources. To this end SAICE has signed various cooperation agreements with sister organisations. The SAICE – ICE cooperation agreement is one such agreement that allows us to share codes of practice, collaborate on research, capacity building and other initiatives that benefit the global industry. Our engagement with other African countries through the Africa Engineers Forum, for which SAICE acts as secretariat, allows African engineers to place their needs on the table. Through SAICE's continued efforts, the WFEO (World Federation of Engineering Organisations) have concentrated its efforts largely in the developing countries and many projects in Africa.

Capacity building

Addressing the quality and appropriateness of school curricula to prepare learners for higher education is vital. SAICE alone should not take up this challenge, but the entire engineering fraternity. Inappropriate, un-researched decisions with regard to school curricula could have serious consequences that in turn affect realistic intake into universities and universities of technology. By way of an example, some three years ago a decision to allow geometry to become an optional subject resulted in many students qualifying to enroll into engineering higher education institutions, only to discover that without geometry as an essential learning tool, the student is faced with tremendous difficulties understanding what is deemed basic. This then compels the institution of higher education to offer extra learning preparatory programmes to enable students to be brought up to speed. Therefore it is essential that the involvement of academics and practitioners, i.e. engineers in public and private practice, be engaged by our decision-makers in government when formulating and putting together the appropriate curricula. The recipients of the trained resource that ultimately puts to use these resources must be part of the development process. I believe that this vital link has been neglected in the past.



We have, however, produced some 10 000 to 12 000 untrained technicians over the last few years. Our inability to provide training and post academic qualification is evident in the number of these unemployed resources. The past years of enormous construction activity and economic upsurge did not yield all the positive training that ought to have been realized. I believe much of the opportunity to train and build future capacity was squandered. As Voluntary Associations SAICE and its sister associations have to work with the various structures available to pool and integrate our efforts to locate and provide training for the desired objectives. Statutory bodies such as the CBE (Council for the Built Environment), the CIDB (Construction Industry Development Board), the various SETAS, and government ministries with their programmes of capacitating and training, must be seen as complementary agents and partners in our quest for capacity building.

SAICE's own Section 21 Company – Civils Masakheni, led by Allyson Lawless - has numerous projects through which much required technical assistance is being supplied to local government and municipalities (through the DBSA's Siyenza Manje programme). Its learnership programme has been able to reach out to untrained engineers and technicians, assisting them in mentorship and training. This year Civils Masakheni has secured further funding which enables us to continue with the programme.

Enabler

A wise person once said, "Our role is not to see the future, but to enable it." The role of the new age engineer has changed dramatically over the last two decades. At a recent ASCE (American Society of Civil Engineers) conference, one of the themes purported was that the engineer must transform himself – "FROM BUILDER TO INTEGRATOR". This is certainly very applicable to us here in Africa. The engineer must be a messenger and an integrator. At SAICE we strongly believe that collaborating and integrating our collective efforts will have a significantly greater impact on our current industry issues. We will, as part of our strategic actions, resuscitate more engagement with other institutions and organisations in our industry. We

believe that the likes of CESA, SAFCEC, SABTACO, and IMESA, to name but a few, must get together to engage jointly on the issues that ail the built environment industry.

I commend CESA (Consulting Engineers South Africa) and its past President Felix Fongoqa for their stance and fight against corruption. Corruption is Africa's number one disease that robs the African people of basic needs to survive. CESA's roll-out of their Business Integrity Management System is something much required and desired today. We should be driving this deeper into Africa. SAICE supports initiatives against corruption and believes that, as trusted advisors to society, we should use our position to speak out against corruption. Recently SAICE re-launched its own Code of Ethics to guide its members.

Conclusion

We as SAICE members should transform ourselves to fulfill the roles demanded by society and, in our quest to attain career fulfillment, we should act as trusted advisors to society, striving to meet our social and moral obligations. We must be the innovators providing new technology to counter the detrimental effects of the depletion of our natural resources. We must be the mentors and teachers of our new capacity, and successors who will be entrusted to take up the cudgels for the civil engineering profession, and lastly we must be the enabler who will strive to create a platform for all to participate, and use this effectively to integrate our efforts towards common interests and mutual benefit in our built environment industry.

We should continue promoting SAICE as the voice of the civil engineering profession and, as such, supporting the National Development Agenda and NEPAD (New Partnership for Africa's Development). We want to see more participation by representative geographical groups at all levels and structures of SAICE. We want Divisions and Branches to be more integrated with SAICE's national structures.

SAICE must be prepared to transform itself to meet our society's right to new thinking and dynamic leadership, including the African engineer's view.



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