ADDRESS TO THE CONFERENCE
OF CONSULTING ENGINEERS SOUTH AFRICA

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MINISTER IN THE PRESIDENCY: NATIONAL PLANNING COMMISSION

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Distinguished Delegates

Thank you for the opportunity to address you today at this important conference for which you have selected "Business Integrity – the CESA Way" as a theme.

It is at times such as the present, when the global economy is adjusting to the effects of its own shortcomings, that engineering can and must flourish. The financial sector is in deep turmoil – green shoots or not; manufacturing is trying to take stock of its own future – uncertain as to whether key components in supply chains may have been squeezed out of existence and whether consumer demand is likely to recover to the halcyon days of earlier this century; and there is ongoing pressure on natural resources as diverse as future oil reserves or oxygen. At times like these, it is to engineering that the world looks for leadership and innovation.

So we encounter few surprises when we learn of the extensions to the Shanghai Maglev rail system, capable of propelling trains to speeds of 431 km/hr, or the request from the State of California for $4.5bn to construct one of the largest high-speed rail networks in the USA, or the effective shrinking of Europe eastwards by the rollout of further high speed rail. Each one of these projects causes engineers to drool – partly because they bring together various disciplines from civil to electrical and mechanical engineering. But the rails projects are only a foretaste – green energy demands have unlocked the potential of new solar and nuclear possibilities and an entirely new discipline called oilgae – with capabilities as diverse as biodiesel from algae and a novel approach to water purification using algae. The new list of engineering possibilities is

endless. It is also important that we recognise that many of these offer leapfrog opportunities to the developing world – so we must, of necessity, include Africa in the range of endless innovation and possibility.

However, the industry will undermine its own potential if it fails to heed that which CESA has called to attention - the ethical challenge.

Let me draw attention to three of the pertinent ethical challenges for engineering, and consulting engineers, in particular. The approach I take is more lateral than focusing narrowly on corruption.

The first of these is **costs**. Engineering costs, particularly in construction, but also in other branches, has spiralled out of control. It is important that this challenge is understood and tackled head-on. Allow me, for ease of reference, to use the example of construction projects – partly because it is fairly easy to find masses of information about what goes wrong. But, before referring to examples, it may be useful to determine what the cost drivers of construction are – and who ought to make a call in this regard.

From our own experience, National Treasury published a document entitled, “Provincial Budgets and Expenditure Review” about a fortnight ago. Two examples from this 341 page document would suffice. In respect of schools, give or take similarities in size and standards, prices range from R 12.5 million per school in the North West province to R 38 million in the Free State – in between, at an average cost of R 27 million, are the state-of-the-art schools in Limpopo Province. Why the wide divergences? Or look at surfaced roads constructed, where divergences range in areas with similar topography – the Northern Cape at R 1.8 million per km, to Limpopo at R 3.2 million per km, to the Free State at R 9.5 million per km. This pales into nothingness when compared to Kwazulu-Natal, where the roads are paved with platinum at a cost of R 105.7 million per km. What are the cost-drivers of these large variances? Who knows – do the competitors know and care? Do the consulting engineers intercede on behalf of their

clients, the issuing authorities? Might there be unwarranted and unlawful takers between the issuers and the final product, without a whistleblower in sight? Who talks about these issues? Who sets the benchmarks to ensure that deviations are properly motivated and recorded? Who acts as the custodian of those who need these services, and who would be seriously disadvantaged by the state's inability to provide adequate services? I ask again, where are the professional technical intermediaries called the consulting engineers? There is also the reality that the prices of a number of key inputs to the construction sector – reinforcing bar, bitumen, bricks, and building boards – have all declined in the past twelve months. Yet, even if the price escalation demands are a bit more muted than they were a year ago, why is there no symmetrical commitment to price de-escalation? Who watches? Who asks?

Now, before you accuse me of dumping on South African contractors and consultants, let me share two examples from elsewhere – on 22nd September, the Office for Fair Trade in the UK fined the construction industry (I am not sure exactly how this was defined) an amount of £129 million for bid–rigging. The three-year investigation revealed that in an era of abundant public work, contractors consciously mispriced their tenders, so that each time the winning bidder was known beforehand and competition was eliminated. Horrible – but are we very different? What is the evidence at hand?

Perhaps more shockingly, Reuters reported two days ago that USAID had launched an investigation into whether the Taliban are funded from construction tenders awarded by the Pentagon. The article mentions that contractors pay the Taliban up to about 20% of contract value as protection, and that this could amount to approximately $160 million per annum. So, the Pentagon may be funding its enemy in the Afghan war through the add-ons in the construction sector there.

So where are the pricing norms? Who calls the benchmarks? Who blows the whistle?

The second ethical challenge I wish to draw attention to is **skills**. You would be aware of the publications entitled "Numbers and Needs" by Allyson Lawless, and would share

with me an appreciation for the depth and quality of her work. You would also agree with me that the only drawback is that it addresses only one engineering discipline. Again this is not a uniquely South African problem – the Financial Times reported two days ago that India faces a chronic engineering skills shortage. The article draws attention to the fact that India has only 110 000 highway engineers and that China had five times that number when they expanded their road infrastructure in the 1990's.

What shocks me about the example of India is that, from the time that the India Institute of Technology was established by Prime Minister Nehru, it produced sufficient engineers not only for India, but also for export to different parts of the world. If India now faces a crisis, how much larger is this likely to be in other parts of the world? A study by the Royal Academy of Engineering in the UK reports similar challenges, and a report by the UK Institution of Engineering and Technology confirmed the shortages and advised that UK companies are actively recruiting engineers from South Africa, India and China to plug the gap, but that even their endeavours are insufficient.

A recent report in the USA revealed that it has a shortage of about 75 000 engineers and definitely too few engineers to reach its Renewable Energy goals. Two years ago, a detailed report on Asia confirmed skills shortages on a country-by-country basis. Issues were as divergent as India having fewer than 3 000 pilots and needing 12 000 by 2025, or China needing 2 200 new pilots each year to maintain the growth of air travel – meaning they would need more than 40 000 pilots by 2025, while few airlines are training more than a few dozen pilots a year. But this story cuts across the professions – India reported then that they would have a shortage of 500 000 IT professionals by 2010. India – a shortage of IT professionals and highway engineers? Almost unthinkable, but yet confirmed in the reports. The list is endless – get to the engineering sections and we should all be exceedingly worried.

I raise the skills issue as an ethical challenge because if engineering firms continue as at present, recruiting from each other to fill gaps of skill and employment equity targets by merely offering higher and higher salaries, then I'm afraid we are doomed not to

realise this enormous opportunity for a rapid expansion of engineering to better the lives of our people.

To return to Allyson Lawless' study on Numbers and Needs in Local Government (her Blue Book) – at the present rate, municipalities can neither maintain nor expand the elementary services such as roads, storm-water drainage, sewerage and water-purification plants, never mind having the ability to contract and oversee construction. A huge crisis looms. Engineers must know this, appreciate the risks and engineer a solution.

Obviously, there has to be a much larger investment in training and more training – not just of people already in engineering. This task demands an all-in effort to persuade young people still at school to seek a future in engineering. Of course, it will also mean a significant investment in improving the quantitative skills taught at schools in order to ready young people for absorption into engineering study. It is important to establish whether this industry is willing to invest in its own future, or instead undermine its very ability to deliver services on a basis of continuing improvement. A conscious disconnect with its future is, in my view, ethically unacceptable for this profession.

The third ethical challenge I wish to draw attention to is the **environment**. This is, of course, an exceedingly topical debate in preparation for the Copenhagen conference. Sadly, it is a debate dominated by politicians and environmentalists – and engineers are much too silent. Perhaps it is because so many of the difficulties referred to arise from dated engineering solutions, things that emit load of carbon. I submit that we all need a different logic to inform this debate. Nobel laureate Amartya Sen, in his most recent book, "The Idea of Justice" offers such an alternative logic. He writes:

> "The environment is sometimes seen as the "state of nature" including such measures as the extent of forest cover, the depth of the groundwater table, the number of living species and so on. To the extent that it is assumed that this pre-existing nature will stay intact unless we add impurities and pollutants to it, it

might therefore appear superficially plausible that the environment is best protected if we interfere with it as little as possible. This understanding is defective for two important reasons. First, the value of the environment cannot just be a matter of what there is, but must also consist of the opportunities it offers to people. The impact of the environment on human lives must be among the principal considerations in assessing the value of the environment. To take an extreme example, in understanding why the eradication of smallpox is not viewed as an impoverishment of nature. Second, the environment is not only a matter of passive preservation, but also one of active pursuit. Even though many human activities that accompany the process of development may have destructive consequences, it is also within human power to enhance and improve the environment within which we live. In thinking about the steps that may be taken to halt the environmental destruction, we have to include constructive human intervention. Our power to intervene with effectiveness and reasoning can be substantially enhanced by the process of development itself."

Few could argue as forcefully for the responsibility of engineering for an ordered development in pursuit of the improvement of living standards. Ethically, a continuation of the failed engineering solutions or an abandonment of the responsibility to find the "constructive human intervention" are equally bad and counteract the vocation of engineering in itself.

So, how do we deal with these issues going forward?

We should accept that the market will not provide solutions, save in those areas where profits can be made. To apply a similar example to engineering would be the equivalent of CESA accepting that contractors can construct wherever, whatever and whenever without the necessary intervention of design and oversight by consulting engineers in what

they do. The state and markets will co-exist. Within this context it is important that elected representatives of the people do not hand over all power and responsibility to

the markets. The economist James K. Gailbraith raises this issue quite sharply when he writes (in "A Predator State"):

> "A country that does not have a public planning system simply turns that function over to a network of private enterprise – domestic or foreign – which then becomes the true seat of economic power. And that is why the struggle over planning is, and remains, such a sensitive issue: it is a struggle over power. It is a struggle not between democracy and the corporation, but between those – scientists, engineers, some economists and public intellectuals – who attempt to present the common and future interest and those – banks, companies, lobbyists and the economists whom they employ – that represent only the tribal and current interest."

So we have a responsibility to plan for the kind of future we desire for all South Africans. Existing in many of the world's most dynamic countries is the capability to plan. Whether you would choose to understand the evolution of industrialisation in South Korea, the dynamism of manufacturing and infrastructure roll-out in China, the development of the economy, social services and vast rural areas of India, or developments in Malaysia, in Turkey or Brazil - if those are the phenomena you chose to understand, you would have to examine the national strategic planning initiatives in those countries. This government has recognised the absence of a planning capacity as a major deficiency in our system, hence the initiative taken by President Jacob Zuma to establish a National Planning Commission.

The Commission will comprise about twenty smart South Africans from a variety of disciplines who will, on a part-time basis, give impetus to this expressed need. Their task will be to identify the needs, to call for expert inputs from researchers in a number of fields, and to facilitate both a national consensus around the future we want for our nation, and facilitate decisions by Cabinet. The Green Paper on National Strategic Planning sets out the approach that we will take on this matter. (The document is available at www.thepresidency.gov.za). A Green Paper is a set of policy proposals that government places before the nation for consideration. As before, we recognise

the power and responsibility of Parliament to receive the inputs of South African institutions and individuals to advise Cabinet on how it might consider either sharpening or amending the proposals. I sincerely hope that CESA will mobilise its resources in order to be heard on this matter.

It is likely that the Commission, when established, will initiate a national conversation about the kind of South Africa we wish to construct in the next twenty years or so. As a first step, it will also have to oversee a series of investigations into matters such as, amongst others:

- Long-term macro social and demographic trends
- Long-term availability of water
- Energy consumption and production
- Conservation, bio-diversity and climate change adaptation and mitigation
- Local economic development and spatial development trends
- Innovation, technology and equitable economic growth
- Public transport - medium and long term choices
- The defence industry and long-term defence capabilities
- Capability and performance of the public service
- Advancing human resources for national development.

You will no doubt recognise the three ethical challenges I referred to earlier among the issues that could be adequately covered by these thematic issues. The task will be fairly complex since it will require the simultaneous evaluation (rather than a sequential approach) of all of these and other matters. If the National Planning Commission takes a leaf from the experience of other, similar commissions, it will then synthesise these ideas into sets of five-year deliverable targets. Cabinet and Parliament will have to take a view on these matters and ensure that the state is capable of doing the detailed policy work in departments, monitoring progress and then ensuring that the government is held accountable for performance against plan. It is worth emphasising that the Green Paper on National Strategic Planning sees the planning function as a facilitator of the planning process and on capacity building, rather than as mechanisms for top-down

control or central planning. The key role of line ministries, and capacity building in the sectors, is critical for success – it is at the line that ministry planning, budgeting and implementation intersect.

The other big initiative taken by President Zuma was the establishment of a Ministry in the Presidency which will be responsible for the Performance Monitoring and Evaluation of government ministers, MECS and mayors across the three spheres of government. Minister Chabane has made it clear, with the full backing of President Zuma that public performance contracts will be signed with the public representatives.

Government will, of necessity, function very differently as these systems are effectively implemented.

But we are not sitting around waiting for the perfection of a bold new 5-year plan. The nation must be put to work now, and even harder. You would all be aware that the public sector has a mammoth infrastructure programme worth some R 787 billion over the next three years that we will continue to work at. You will also be aware that we were fortunate in having a number of "shovel-ready" projects when the economy went into recession, and that a number of these projects were front-loaded because they focus on the 2010 FIFA World Cup. I need not emphasise here that it will be in our collective interest if we tried, by all means, to avoid a sudden stop to this work when the games begin. Perhaps we should be working together intensely now to maximise the continuity of effort.

The most important skill set of engineers is innovation. The three ethical challenges I referred to – costs, a growing skills deficit, and "the constructive human intervention for environment change" – will respond well to innovation. Engineer them.

I thank you for this opportunity and wish you well both in your deliberations here and in your efforts for the betterment of South Africa.