

EXCHANGE OF ENGINEERING TECHNOLOGIES BETWEEN SOUTH AFRICA AND CHINA

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I consider it a great privilege to express a few thoughts on the exchange of engineering technologies between South Africa and China. The subject cannot be isolated from the prevailing technology and business environments in the two countries and from the present global environment if success is to be achieved with any programme of technology exchange. A few remarks may serve to illustrate the point.

The world is going through profound change. Tom Peters calls it a fabulous time to live in and then explains in his typical style:

- within 10 years biotech and infotech changes are going to make everything we know today immaterial
- just think of the things we now know and we did not know in 1995
- the world is in an all out talent war
- talent is the number one core competency of the 21st century
- the role of government and the role of organizations are being reinvented world-wide etc etc.

Thus Peter Drücker explained:

Our time is not labour intensive, nor material intensive, but knowledge intensive (and skills intensive).

Wolfgang Grulke in one of his recent books has the following listing in What's Different today.

Old Economy

Learn a skill
Security
Must be "in control"
Capital equipment
Status quo
Hierarchical and regulated
Company man

New Economy Spirit

Lifelong Learning
Risk-taking
"In control" means "inflexible"
Intellectual capital
Speed and change
Distributed and networked
Individual

Transformation of the workplace and marketplace has become a way of life

- It is no longer about efficiency only
- It is no longer enough to work smarter
- It is no longer enough to work better
- It is about relevance and differentiation
- It is also about social responsibility, employment equity, capacity building and empowerment of citizens
- The mobility of the people is the society of the future
- Our capacity to invent the future requires that we do also develop the capacity to adapt to the future.

Marabeth Wheatly very astutely provided further perspective to the ongoing debate when she said:

In creating the new world beyond 2000 we should not take orders from technology only

- We have to lead at a higher level
- We must move into a pro human spirit phase
- Participation is needed if commitment is required.

Again implying

- Being able to communicate well
- Addressing the hearts and the minds
- Involving the human spirit as well.

Prosperity and much of the new economy spirit as well as the transformation of the marketplace can be found in both South Africa and the People's Republic of China. But wide-spread poverty also exists in both countries.

During my visit in October 2002, for the signing of an Agreement of Co-operation between the SAAE and CAE, I have been very impressed by the levels of Chinese entrepreneurship and technological development.

A few observations should illustrate the vast scale of new developments taking place.

- China has 1060 universities and 60% of the students are enrolled in science and/or engineering.
- The media and public statements widely carry the theme of "*China is changing towards a market driven knowledge economy*". Information technology and the newer bio- and nano-technologies are highly supported in many large and modern High-Technology Industrial Development Zones.
- A massive construction programme of infrastructure like roads, railways, dams, water systems, buildings, etc. is largely funded out of own savings and with probably no equal elsewhere in the world. To illustrate: According to the President of CAE more than 2000 highrise buildings have been completed in Shanghai over the past 10 years. Since 1996 about 16 000 km of expressway have been constructed and present plans call for the completion of a further 2000 km per year up to 2010. The Chinese main road system stretches over some 1,7million km and includes some 280 000 bridges. It is said that of the 10 largest bridges in the world, 8 are in China.
- Beijing is preparing well for the 2008 Olympics with new stadia and infrastructure including large expansion of its subway system.
- The International Forum and Expo on Information Technology Innovation in Jinan, capital of the Shandong Province, impressed with the scale, the depth and great diversity of state of the art ICT products of China.

Both South Africa and the People's Republic of China are developing countries. Both countries have a wide range of levels of sophistication in their development. In the exchange of engineering technologies it would be necessary to have clarity of priority and of focus.

This can vary between the following two extremes:

- addressing sustainable poverty alleviation through job creation programmes and through basic infrastructure, agriculture, mining and manufacturing development.
- ensuring sustainable global competitiveness through exchanging knowledge on the latest developments in ITC, biotechnology and nanotechnology.

Depending on the focus within the above range, programmes can inter alia be based on the following:

- Co-operation between SAAE and CAE on arranging workshops and conferences to focus on areas identified to be most appropriate. Some conferences have already taken place and some have been identified in the signed Agreement of Co-operation.
- Arranging exchange programmes for university lecturers and students. Such a bilateral agreement resulting from the SAAE visit to China has recently been signed between the University of Stellenbosch and the South China University of Technology (SCUT) in Ghangshou. Some of the other universities may follow soon.
- Involving South African and Chinese professionals (and their organisations) of the various engineering disciplines in joint ventures on projects in China and in South Africa.
- Arrange opportunities for entrepreneurs and businessmen to attend workshops or expo's and to identify business opportunities within the wide range from the field of agriculture to the fields of manufacturing, mining and research and development.
- Develop user-friendly exchange programmes for young graduate engineers to be employed by government or private enterprise. Such opportunities should be developed on the lines presently available between Britain and the Commonwealth countries.
- Exploit the mass media and the Internet to provide a network of information on needs and prospects for the full range of possible stakeholders in technology exchange programmes and associated benefits.
- Exchange information between ECSA and its Chinese counterpart on the structure, control and management of registration in the engineering Profession in South Africa and in China. A first stage of this process has already been completed during the visit of SAAE to the CAE in October 2002.

The approach of technology exchange between the two countries should be flexible and needs to be revisited at least annually.

It needs to adapt to the ever-changing business and technological environment in order

- to provide a sound foundation for fruitful future co-operation in engineering, technology and development
- to give practical expression to a spirit of international co-operation in engineering technology exchange
- to play a major role in promoting social equity and economic development in both South Africa and the People's Republic of China
- to ensure sustainability in goal realization

Two closing thoughts on the exchange of Engineering Technologies between China and South Africa:

- Confucius on sharing knowledge when he said: *"As for the humane wishing to be established himself, seek also to establish others; wishing to be enlightened himself, seek also to enlighten others."*
- The advice of President Mandela where he stressed the need to consider our priorities: *"Are we to decide the importance of issues by asking how fashionable or glamorous they are? Or by asking how serious they affect how many?"*