

CHAPTER 11 : CONCLUSIONS AND RECOMMENDATIONS

11.1 OVERVIEW

The RSA's prime concern is the alleviation of poverty through the development of the national economy. The government has placed a high priority on social and development programmes to this end. Because of this priority and the absence of an external threat to the RSA, the Department of Defence receives a disproportionately small allocation of the national budget.

The prime purpose of the SANDF is the defence of the RSA. Secondary roles such as humanitarian aid, support of the SA Police Service and peace-keeping have put pressure on the organisation's ability to operate within its budget.

Rampant crime in the region, increasingly involving criminal syndicates, and the instability of Africa are a dire threat to security and thus the economy. Foreign direct investment has been slow to materialise for various reasons, probably including the crime and regional instability, and this has weakened the growth opportunities for the national economy.

The RSA has significantly fewer scientists and engineers than are found in developed countries. This situation is exacerbated by the emigration of skilled citizens. The DACST, however, has what appears to be a coherent policy to build a competitive science and technology base for the RSA, though. Poor education and a lack of interest in science and technology are a challenge to accomplishing that goal. Overzealous application of affirmative action and "fast-tracking" is depriving people in the designated groups of the opportunity to consolidate their learning growth and competence. The requirement for "representivity" often deprives new entrants to a field of expertise of access to experienced scientists and engineers.

The SANDF has great difficulty in attracting and retaining ETF personnel, mainly due to poor salaries. This study has discussed a case where the cost of paying contractors to supply the same service was about ten times greater than it would have been to triple the salaries of the NCOs that previously carried out the work. It appears that adherence to remuneration policies enjoys greater priority than cost-effectiveness of the department. The acquisition of new Products Systems would restore and enhance many of the SANDF's capabilities. However, the loss of skilled, experienced personnel places the SANDF's ability to sustain its capabilities in dire peril.

The SANDF has to maintain its defence capability as a credible deterrence to any aggressors. It is expected to do this as a small, technologically advanced force.

This study has addressed the contribution that the Engineering Technical Family (ETF) could make towards the following:

- Sustaining and enhancing the SANDF's capability to ensure its role as an effective deterrent to potential aggressors.
- Reduce the cost of ownership, operation and support of the SANDF's resources.

An effective defence force is one that is a successful deterrent by virtue of its military capabilities. The efficient design, evaluation and support of Products Systems would reduce the cost of ownership and sustain an appropriate degree of competitive military advantage. Through achieving the two goals mentioned above, the ETF would improve the cost-effectiveness of RSA's defence capabilities. This would contribute towards the success of the national economy.

As discussed with proposed examples in section 6.2, the ETF's vision, mission and objectives must support those of the SANDF.

11.2 ETF ROLES AND FUNCTIONS

The two main groups within the ETF proposed by this study are:

- Engineering Services develop and upgrade baselines. They ensure the capability, dependability and supportability/cost of Products Systems. The Engineering Services can be divided into three main groups:
 - Products Systems Engineering is responsible for the integrity of the Products Systems within each of the Systems Groups/TyFs.
 - Joint Services Product Engineering is responsible for the integrity of the Products of the AoS within the SANDF.
 - Joint Systems Engineering is responsible for overall systems integrity, compatibility and optimal application of the Products Systems of the SANDF. The Joint Services Engineering function may exist as a virtual organisation.
- Technical Services support Products Systems according to the baselines. They ensure the availability and optimise the support cost of Products Systems:

- Products Systems Support at O Level provides support and maintenance services to the Products Systems of the Systems Groups/TyFs.
- Products Systems Support at D Level and one or more intermediate level(s), supports and maintains the Products Systems' Products.

This process-oriented categorisation of the ETF can be effectively and efficiently employed in the structures proposed in CHAPTER 10: Aligning Engineering Programmes.

11.3 ETF COMPETENCE AND CULTURE MANAGEMENT

Design influences the quality of Products Systems and processes. The ETF could directly influence the capabilities of the Products Systems and processes through design and evaluation. Engineers, technologists and technicians perform design and evaluation work. The quality of design is directly dependent on the competence of the designer.

It is crucial that intensive communication between the Users and ETF takes place, so that they have a common understanding of expectations, requirements and constraints. This influences the quality of the services provided.

Competence resides in people and is lost with the departure of the competent person. Competence is dependent on culture. A favourable psychological climate is essential to the promotion of competence and its development. Competence must therefore be managed effectively, as sustainable competitive advantage can be derived from it. Competence is a valuable resource derived from:

- Training and education.
- Collegial communication and interaction with peers, both engineering and operational.
- Experience.
- Intelligence.
- Defence Evaluation and Research Institutes (DERIs).

The sources of competence should be exploited by:

- Enabling and encouraging communication between the following role-players to stimulate ideas and innovations:
 - The ETF role-players in Joint Services Engineering, Products Systems Engineering and Joint Services Product Engineering.
 - Operations or Combat personnel.
 - DERIs.
 - Product and Service suppliers.
 - Acquisitions.
 - ARMSCOR
 - Technology Intelligence.

- Technical Services personnel.
- Exposing personnel within the Engineering functions to procurement, development and evaluation projects.
- Continuing education, training and development in both engineering and military areas.
- Regular feedback on project progress and design reviews.
- As described in section 3.5.4, develop a psychological climate conducive to competence development and innovation.

The wealth of knowledge in the defence industry must be harnessed. The SANDF is the main organisation for which the knowledge is developed and maintained. The SANDF should therefore harvest, nurture and use the knowledge to develop its core competence and the associated competencies, capabilities and resources, described in section 10.5.

The proposed Joint Services Product Engineering function would create a centre of excellence for the AoS to share. Apart from the functional advantages, this approach would have significant cost benefits.

Technology is an important factor in gaining a competitive advantage in capabilities against threats. Engineering should be at least aware of the technology projects in process.

11.4 CAPABILITY AND COST MANAGEMENT

The principle of capability management depends on optimal utilisation and support of the Products Systems, personnel and processes that constitute the User System.

The principle of cost management is based on the concept that Products Systems, personnel and processes that constitute the User System, if well managed, will cost less to own, operate and support.

The life cycle cost of Products Systems and processes is a result of the design. A competent designer will ensure the lowest life cycle cost.

Upstream changes to Products Systems and processes are considerably less expensive than downstream changes. Seemingly large investments in upstream activity have a multiplying effect, reducing costs downstream. Controlling configurations of Products Systems and their design and baseline information can ensure effective and efficient management.

The costs of the SANDF's value chain, could be reduced through the stimulation of effective communication and the removal of duplication of effort. The concept of jointness reduces cost. In many cases a joint resource, such as the proposed Joint Services Product Engineering function, is more efficient and effective than many resources separated into the AoSs. Programme and Project Management is suitable for driving the processes in the support of User Systems and Products Systems.

Technology is an important factor in gaining a competitive advantage in reducing costs. This advantage may be embodied in the physical artefacts or processes used in the operation and support of User Systems.

11.5 CONCLUDING STATEMENT

In conclusion, this study has shown that by strategically using a systems approach to the application of the ETF, it could align engineering programmes with the core business of the SANDF to ensure its competitive advantage. South Africa will then have an affordable, technologically advanced defence capability that is a deterrent to potential aggressors.