
EXECUTIVE
ARY
TECHNOLOGY WORK SESSION
17 -20 MARCH 2008

Executive Summary Technology Work Session

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INTRODUCTION

1. After consultation with Mr André Nepgen from the Defence, Protection, Safety and Security Department of the CSIR, he agreed to host the SA Army's Technology Workshop over period 17 – 20 March 2008 and at the CSIR's cost.

2. The CSIR, in conjunction with the SA Army Vision 2020 Project Team, compiled a programme and identified suitable speakers to provide their respective views on international, continental and regional technology trends which will impact on peace, conflict and war.

3. Invitations were sent to all services and other stakeholders such as; CJ Ops, Def Int, Def Inst and Dir Military Strategy and were well attended.

4. It was, however, unfortunate that not all of the SA Army's Planning Group Members attended the work session.

AIM

5. The main aim of the workshop, as part of the SA Army Vision 2020 process to complete its future strategy, was to make conclusions on international, continental and regional technology trends in order to compile a SA Army Technology Strategy.

SCOPE

6. The executive summary will cover the following:

   a. Guest speakers and the topics addressed.

   b. Main conclusions after completion of the Technology Work Session.

EXECUTIVE SUMMARY

7. Guest Speakers and Topics. The following topics were addressed:

   a. The Impact of the changing nature of war on technology focus areas – Col (ret) A van Wyk.

   b. Some considerations for the strategic direction and management of SA science and technology required for SA Army Vision 2020 – Mr A. Nepgen.

   c. Global R&D and technology trends – Mr J. Strydom.

d. Considerations of human factors in peacekeeping and combat in Africa – Maj (Dr) A. Falskon.

e. Mobility and manoeuvre (Wheeled, tracked and legged) – Dr S. Els.

f. Mobility and manoeuvre (Terrain) – Mr T. van Dyk.

g. Firepower – Dr F. Mosterd.

h. Command and control – Dr J. Roodt.

i. Situational awareness – Mr F. Anderson.

j. Protection – Dr G.T. Viljoen.

k. Air supportive technologies – Brig Gen (ret) J. Wesley.

l. Training & simulation and experimentation – Dr J. Roodt.

m. Navy supportive technologies – Mr H. Römer-Heitman.

n. Technology integration – Brig Gen (ret) J. Wesley.

o. Technology capability building initiatives (CSIR) – Mr J. Strydom.

4. Main Conclusions after Completion of the Technology Work Session. The following is a list of the main conclusions that were made after the work session:

a. The SA Army technology requirements are to be aligned with those as indicated in Vision 2020, therefore the Vision 2020 technology priorities were confirmed.

b. The management of technology in the SA Army requires an integrated and systems approach in order to tailor the equipment of the SA Army for the future African Battlespace.

c. The SA Army Technology Planning Process demands joint planning with the Operational Operating Concepts as the main capability areas.

d. Due to funding, the SA Army must endeavour to identify and prioritise those technology enhancing capabilities it requires.

e. COTS/MOTS technologies will not always provide solutions and it is therefore imperative to produce / develop niche capabilities that will provide a competitive advantage during operations.

f. The SA Army needs to remain competitive ito its technology due to possible adversaries' ability to acquire advanced equipment. It will, however, be unwise for the SA Army to enter into a technology race. The critical success factor for the Future Landward Technology Strategy is to identify appropriate technology areas that will continue to provide the SA Army with selected and clearly defined winning areas.

g. A major portion of funds must be invested in modelling and simulation.

h. The SA Army should endeavour to become an integral part of an integrated DERI in order to enhance its own body of knowledge.

i. A need for the establishment of a SA Army Concept Development Centre as well as an integrated R&D Centre was expressed.

j. The SA Army has a requirement for specific technology development in support of training.

k. The SA Army is to obtain visibility over the full spectrum of technology development iot be informed about the spectrum of technologies and to prioritise its own strategic interest in respect of specific technologies. Strategic decision-makers should thus be well-informed about what is technological possible, what is required, what is realistic and how these could be integrated in required capabilities.

l. Urgent attention is to be given to define a drastically shortened acquisition process.

m. A requirement has been identified for an organisation to provide immediate solutions to operationally urgent problems.

n. The SA Army is to refocus on its night fighting / surveillance capability and direct specific technology programmes towards this capability.

o. The SA Army is to formulate a policy to regulate the use of GPS and should field a standard system.

p. Policy decisions are required to create the environment to establish a balanced POSTEDFIT landward capability.

q. The SA Army needs to retain the conventional warfare paradigm for the extended long term.

r. The SA Army needs to plan for counter-asymmetry.

s. A decision needs to be taken on whether the Landward Capability is to be a technology leader / buyer / combination of.

t. The SA Army is to allow, for the MT to LT, an OOTW approach to shape its structuring, staffing, equipping and training.

u. The Landward Technology Strategy must be fully integrated with the Defence Technology Strategy.

v. The SA Army should guide the defence industry and invest appropriately.

w. The SA Army should influence non-SA Army technology developments.

x. The SA Army should finalise the SCAMP.

Feedback Syndicate 1

SA ARMY TECHNOLOGY WORK SESSION: SYNDICATE 1 FEEDBACK

Reference A: Vision 2020: Seminar 21

INTRODUCTION

1. The strategic direction provided by Vision 2020 will be used as main drivers to identify the enabling/supporting concepts of the future. This requires an understanding of the means to achieve the desired end states in an environment where drivers, such as scientific and technological innovation are of utmost importance. These enabling concepts/supporting concepts are the main drivers for future landward technologies.

2. The relationship between the SA Army Vision 2020 concepts and technology implies that soldiers and scientists be brought together. The real challenge for the SA Army is to blend these disparate groups so as to efficiently channel scientific innovation in a military useful direction to the best benefit to the SA Army. These technologies must support SA Army armament acquisition projects and attempt to retain appropriate technologies in the landward capability area to support future SA Army concepts.

3. A future orientated analysis of international, continental and regional technology trends impacting on peace, conflict and war was done

AIM

4. The aim of this document is to validate the inputs of the Technology Work Session and to provide a baseline for the future SA Army Technology Strategy.

SCOPE

5. The following aspects are addressed:

   a. Aim.

   b. Guidelines received.

   c. Main Considerations.

   d. <u>SA Army Technology Concept</u>

      i. C Army Intention.

      ii. SA Army technology vision.

      iii. SA Army technology concepts.

      iv. SA Army technology end state.

      v. CSFs.

   e. Technology Overview.

   f. SA Army Technology Strategy.

TECHNOLOGY GUIDELINES RECEIVED

6. Vision 2020, Seminar 21.

MAIN CONSIDERATIONS

7. Vision 2020. Vision 2020 remains the main driver for the development of technology in the joint landward environment.

8. Enabling and Supporting Concepts. The existence and development of future SA Army concepts for our new role in the asymmetric future battle space are crucial for the determination of appropriate technologies to support the focus of main effort (FME). Without parallel integration of concepts and technology, the SA Army will run the risk of being prepared and equipped for the wrong war.

9. African Battle Space. The future African battle space as predicted by the FES remains an important consideration for future tailored technology clusters as required by the SA Army.

10. Technology Budget. The approved Strategic Capital Acquisition Master Plan (SCAMP) is indicative of resources allocated for technology in the landward portfolio[1].

11. SA Army Armament Acquisition Projects. The current approved Armament Acquisition projects remains the FME in terms of technology development.[2]

SA ARMY TECHNOLOGY CONCEPT

INTENTION

12. Aim. The aim of technology in the SA Army is to channel scientific technological innovation into military useful application for the SA Army.

13. SA Army Mandate. The SA Army has the mandate to submit technology requirements to the DOD in order to support SA Army capabilities in the future landward battle space. These technology requirements are inclusive of the full spectrum of the operating systems.

14. SA Army Strategic Intention. The SA Army Technology Requirements conveys C Army's intention to the DOD regarding tailored technology to support the SA Army as an important role player in the (Joint) Landward Defence Capability to fulfil its role in the future battle space. C Army has the intention of bringing technology to the soldier. This implies that the SA Army will jointly determine the direction of technological change in parallel to the development of future SA Army concepts as articulated through Vision 2020 Strategy. Technology however is the means and not the ways and ends. The principle of concepts first and then technology as an enabler, is the dominant imperative. Technology however can change doctrine and/or concepts.

SA ARMY TECHNOLOGY VISION

15. Scientific and Technological Innovation. In order to position itself at the sharp end of a credible and affordable future military capability, the SA Army must identify and develop concepts in order to execute missions as prescribed by the Military Strategy and the Joint Force Employment Strategy. This requires an understanding of the means to achieve the desired end states in an environment where drivers, such as scientific and technological innovation are of utmost importance. Technology by itself is meaningless unless it can be applied in a military useful direction. As such, modern trends in technological concepts linked to new military applications in the African battle space can provide the foundation for potential future combat paradigms by supporting the development of future war fighting concepts. The challenge for the SA Army is to embark upon a new approach by linking science and technology to relevant military application.

16. Creating Technology Context. Many ways exist to create technology context but the

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1 SCAMP (MCC Issue 30 Nov 07).
2 Ibid.

following has to be considered:

a. If mature technology exists, the SA Army must be able to evaluate its potential benefits, threats and time scales regarding application and innovation.

b. The SA Army can also consider areas that are forecast, and identify further work requirements to realise useful outputs.

c. The SA Army may also identify development paths and associated decision points that allow translation from the "as is" to the realization of future technologies.

17. Incremental Technological Change. The SA Army supports the approach whereby technology should be developed through incremental improvement either to a particular technology or the integration of that technology with other technologies. The intention is to map the road from the current situation to derived technological concepts. The FME for the SA Army regarding technology planning is to identify the technological concepts that produce the best return on investment. The aim then, is not only to focus on the forecasting of technology, but also to forecast its impact.

18. Linking the Scientist and the End User. In the absence of a meaningful DOD technological end state and the inherent scientific limitation of soldiers' world wide, the SA Army supports the close interface between soldier and scientist. The SA Army will be directive in terms of what technology requirements are needed, but cannot be prescriptive on how to achieve this. There must be a balance between the competing forces of technological push (scientific innovation) and organisational pull (military requirements).

TECHNOLOGY END STATE

19. The SA Army has realigned its technology requirements for the ST according to the future landward capability requirements originating from Vision 2020. The new SA Army Technology Strategy provides guidance to C Acqn (DAA and DTD) and Armscor programme managers ito the SA Army technology requirements to be developed for the future battle space. In order to effect the end state the following conditions should prevail:

a. Appropriate landward technologies to support SA Army armament acquisition projects as well as identified war fighting concepts, according to Vision 2020, are identified.

b. Technologies must be useful for future application in the future battle space. Technologies of no strategic value to the SA Army must be terminated.

c. An integrated new technology management model and efficient process, which conforms to the systems approach, exists.

d. An accurate database is created and maintained of completed and available technologies.

e. The soldier and scientist relationship is optimised and fully integrated.

f. The SA Army accepts full ownership of landward technologies.

CRIRICAL SUCCESS FACTORS (CSFs)

20. Alignment with the Vision 2020. The SA Army Technology Requirements are to be aligned with Vision 2020 with special attention to the following capability qualities:

a. Light and manoeuvrable.

b. Precision strike.

c. Full protection.

d. Information superiority.

e. Sustainment in all conditions.

21. Integrated New Process. The management of technology for the SA Army requires a new approach, focussing on an integrated process, involving planning, execution and control at various DOD levels with different role players in an integrated and joint manner.

22. Systems Approach. A systems approach must be applied in the sense that the SA Army's technology requirements are analysed ito their influence on the operational level operating systems, ie operational command and control, operational movement and manoeuvre, operational firepower, operational protection, operational intelligence and operational sustainment.

23. (Joint) Landward Defence Capabilities. The SA Army Technology Planning Process must adhere to the envisaged interface/requirement of the JDCP of the CJ Ops Div. The SA Army Technology Planning Sub Process demands joint planning, by all the role players in the SA Army as well as the appropriate Level 2 Divs, in effecting the SA Army technology end state.

TECHNOLOGY OVERVIEW (CURRENT SITUATION)

CURRENT PROBLEM AREAS

24. The following problem areas, pertaining to the current technology management and projects, exists:

a. Funding. A lack of sufficient funding remains a problem area. This is most probably the main reason why guiding principles such as 'Long Term Orientation' and 'Real Enhancement' cannot be adhered to.

b. Technology Scanning. No formal scanning of the technological landscape takes place.

c. Lack of Formal Strategic Guidance. No overall DOD Technology Strategy is available, therefore there are no guidance.

d. Expertise. The end user does not always comprehend the complex nature of technology, as well as the relevance of a specific technology to a specific application. This emphasises the urgent empowerment and sustainment of human expertise in the technology environment.

e. Current Technology Management. For example, currently protection related technology projects are included as part of the mobility portfolio, due to the fact that the current chairman of the Mobility sub-committee is also the acting chairman for the Firepower sub-committee. As a result protection related projects are discussed during mobility related project meetings.

VISION 2020

DIRECTING TECHNOLOGY

25. Vision 2020 Strategy as Main Driver. Vision 2020 is the main input to the development of technology as it defines the required capabilities for the future. When studying Vision 2020 as well as other documents such as the Joint Force Employment Strategy the following conclusions can be

made:

a. Vision 2020 accepts a risk in the short and medium term by allowing a relatively smaller force, thereby allowing the capability to renew and grow to the required force levels in the long term. The use of a core growth approach is evident, in other words products systems and technologies must have a core capability during the initial stages, but must make provision to grow as technology improves and requirements change (within limits).

b. On analysing the strategy one can conclude that very limited PME will be available during the first stages when the risk exposure is the highest, and will only become operational at 2015 when the major systems are phased out. The Vision 2020 Strategy and the planned and current vehicle fleet programmes and projects therefore need to be continuously aligned.

26. Capability Drivers. Various concepts have been identified and grouped. The concepts/missions are considered to be ***capability drivers***, therefore these missions have to be taken into account when specifying new requirements or when identifying new technology projects.

27. Capability Areas. The SA Army needs to structure according to the following ***capability areas*** to execute landward contingencies:

a. Command and control.

b. Firepower.

c. Mobility and manoeuvre.

d. Situational awareness.

e. Protection which includes all aspects of protection.

f. Sustainment.

28. Capability Qualities. A list of inherent qualities is also provided that the capabilities must have. Using a thought experiment process and the above information, the process can be illustrated graphically as indicated in figure 1.

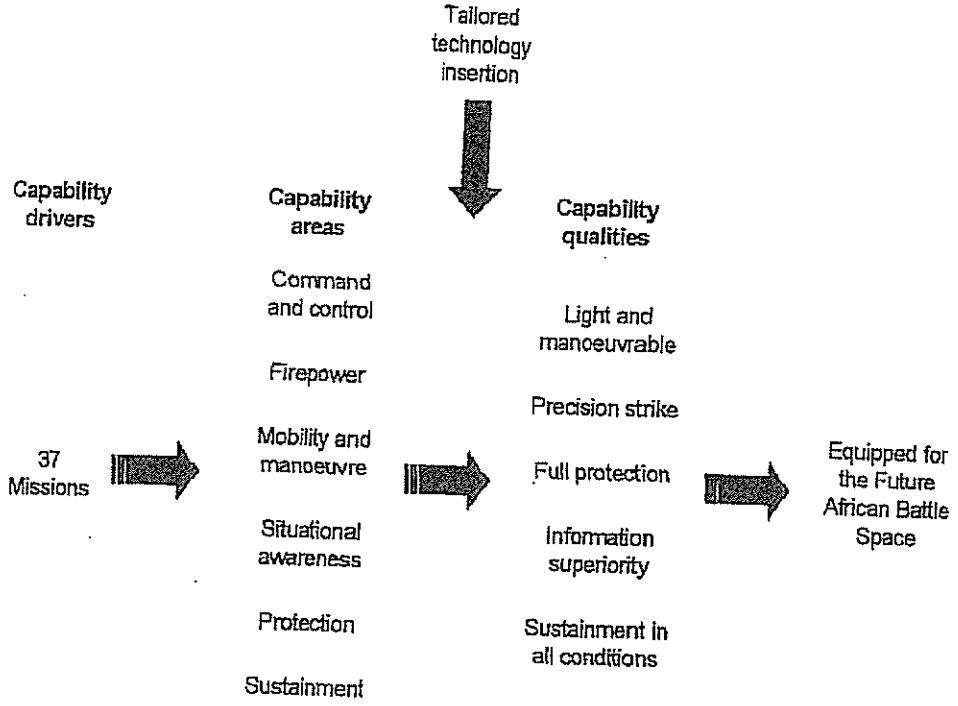

Figure 1: Process to determine capability requirements from Vision 2020

29. Insertion of Tailored Technologies. The missions resulted in the identification of the 6 x capability areas, which with the insertion of appropriate and affordable technologies at the right time during the development process of a specific capability, would result in a capability that is light, manoeuvrable, can strike with precision, provide full protection against the known threats, possess information superiority through C^4I^3RS and can be sustained in all conditions.

30. End State. The result will be a SA Army that is equipped for the Future African Battle Space, as the missions that could be conducted in the Future African Battle Space has been used to determine the required capabilities. The capability qualities extrapolated against the CJ Ops capability management plan can therefore be used as the major contributing factor for a checklist when specifying or assessing new technologies or projects. New projects and/or technologies that do not comply with the qualities should not be considered

SA ARMY TECHNOLOGY STRATEGY

BACKGROUND

31. Changing Battle Space. Within the changing battle space, the SA Army must still focus on its roles and tasks for its primary role which include the full range of PSOs. One of the most critical deficiencies of the SA Army is to project force and to sustain the existing prime mission equipment (PME) used by the SA Army. Although current PME are well suited for a semi-conventional war in southern Angola, the majority of the equipment are heavy, dimensionally large and as a result not suited for deployment by air and operations in a third world infrastructure with narrow roads and bridges. The deployment of PME such as Rooikat and the GV 6 in the African Battle Space is questioned, as recovery using existing vehicles such as the Cavallo, Skimmel and Zebra may not be feasible due to the size of these vehicles.

32. Tailored Technologies. The Future African Battle Space, as well as the requirements of the FES, implicitly requires a 'lighter' force that can easily deploy to the Future African Battle Space in less time, using fewer ships and planes. Although 'lighter', future PME/vehicle fleets should be

equally mobile, lethal, survivable, and cost effective when compared to the existing systems. These parameters, as well as the qualities listed in figure 1, are inputs to the technology strategy.

33. Technology Objective. The objective of the SA Army Technology Strategy is to ensure the *continuing availability* of sound technical *advice* and *advanced* and *affordable* technology to *support* mission-successful defence capabilities.

SA ARMY TECHNOLOGY CONCEPTS

34. Technology Concepts. Derived from the capability drivers and capability areas, the following technology concepts were identified. These technology areas/concepts were benchmarked against the FES and the Vision 2020 and must be used to define, develop and insert enabling technologies in support of the SA Army. The technology concepts are:

a. Command and Control. The capability to plan and to make decisions on the tactical and operational level of war using existing building blocks, tailor made for the contingencies/missions for the current and future combat space in sub-Saharan Africa. The capability to execute tactical and operational level control over allocated joint FSEs is inclusive.

b. Mobility and Rapid Reaction. This capability is in actual fact a subset of operational level movement and manoeuvre. For the purpose of technology it entails the following:

i. Various forms of operational positioning.

ii. Force projection.

iii. Operational and strategic movement into a theatre/area of operation.

iv. Tactical manoeuvre.

v. Responsiveness.

c. Survival, Protection and Sustainment. This relates to the conserving the fighting potential of the landward force to enable it to be applied at a decisive time and place. It relates to actions taken to counter the enemy's firepower and manoeuvre by making soldiers, systems and operational formations difficult to detect, strike and destroy.

d. Appropriate Effects (Internal and Terminal Ballistics). This capability is derived from operational level firepower but relates to the appropriate effects against a variety of ground targets, which are required within the missions to be accomplished in support of the mil strategic objective of promoting regional security where firepower in its true sense may not be appropriate. The following are regarded as potential focus areas:

i. Precision guidance munitions.

ii. Non-lethal technology.

iii. Ballistic propulsion (extended range).

TECHNOLOGY CAPABILITY AREAS[3]

35. Funding of Capability Areas. It can be seen from figure 1 that the capability focus areas, as was deduced from Vision 2020, are the main drivers. It is also important not to group technology areas together that does not belong in the same functional areas, as for example protection and sustainment. The current problems of including protection technology projects with mobility technology projects would be eliminated. It is therefore proposed that the following areas should be used for the identification and management of technology projects. Modelling and simulation technologies are more in support of each of the areas, and are therefore not viewed as a separate technology.

36. Command and Control. Command and control technologies improve or enhance the capability of a product system, unit or formation commander to effectively apply command and control. Technologies that could result in the simultaneous application of joint capabilities battle command on the move (C^2 Bde HQ and lower) and having sufficient relevant information available when required could fall in this area.

a. Digitisation, vetronics and simulation related technology projects would be typical projects in this area.

b. Network centric technology (appropriate)

c. Cyberspace related environment (wireless lan, intra net, inter net etc)

d. Simulation of C2 related effects

e. Interoperable with focus on JIM

37. Firepower. Firepower entails the collective, co-ordinated and effective delivery of munitions. Technologies in this area should be focussed to provide the precision strike capability as required by the Vision 2020/FES through the development of precision systems and munitions. Appropriate terminal effects, as well as the simulation of internal ballistics should fall into this category.

a. Lethal, less than lethal, non lethal

b. Precision long distance fire power

c. Integration of the firepower system with

d. Collateral damage minimise

e. Decentralisation of Fire power

f. Manned and unmanned fire power

g. Intelligent munitions

h. Application of fire power in different types of "terrain" (jungle vs urban vs rural etc)

i. Integration of fire control (Fire Support Coordination including fire planning and target acquisition enabling technologies)

j. Integration the fire power effects

[3] These technologies are broad pointers and will be refined by Oct 08 after a scientific scan/analysis

k. High energy weapons/effectors

l. Electronic Magnetic Pulse effectors (EMP)

m. Thermo baric effectors (appropriate effects based on required missions) "List them"

n. Profiles of smart munitions

38. Protection. This area includes all levels of survivability and protection, in other words against kinetic energy rounds, fire, biological and chemical warfare, land mines and psychological attacks and all the other threats against soldiers, systems and operational formations identified during the appreciation that was executed when compiling the Vision 2020/FES. These are:

a. Detection avoidance (visual, thermal, radar, acoustic and seismic signature management),

b. Hit avoidance (sensors and counter measures),

c. Kill avoidance (armour protection and fire and explosion suppression systems) technologies should be developed to enhance overall vehicle survivability.

d. Typical enabling technology projects that could fall in this category are the simulation of landmine protection, occupant injury prediction, ballistic simulations and the development of landmine simulants.

e. Specific Pointers

i. What needs to be protected

ii. Level of signature management/With what

iii. Psychological protection

iv. Protection against cyber/hacking

v. Protect equipment and information

vi. ECM

vii. Base protection (multi spectral)

viii. Body armour appropriate for asymmetric conditions

ix. Passive defence

x. Personal/indivdual protection

xi. Ruggerdise equipment for ABS

39. Mobility and Manoeuvre. High mobility and manoeuvre entails various forms of movement, either to or within the theatre of operations. The Future African Battle Space will be significantly different from the environment existing South African PME were designed for, with predominately clayey soils in areas such as the DRC and Burundi compared to the predominately sandy soils in South Africa, Angola and Namibia.

a. All aspects pertaining to the enhancement of the movement of soldiers, systems and operational formations should fall in this category, including Engr Fmn related

projects (to ensure the mobility of employed forces) and the delivery by land, air and sea of supplies.

b. Terrain measurement, terrain classification and generic mobility simulations are important enablers for mobility and manoeuvre technology projects.

i. Force projection technologies (sea, air, land)

ii. Sealift vs maritime manoeuvre

iii. Inland water

iv. GIS related technologies

v. Jungle technologies

vi. "Foot Wear"

vii. Construction capabilities (roads, run ways, unpaved and paved surfaces)

40. Situational Awareness and Intelligence. Situational awareness focuses on tactical reconnaissance, intelligence, surveillance and target acquisition and could include projects researching manned sensors, unmanned sensors and information warfare technologies.

a. Sensor and fusing (integration) thereof

b. UAV (full spectrum)

c. Robotics?

d. MMI interface

e. Acquiring, assessment and dissemination of info

f. Human Enhancement technologies?

g. Intelligent sensors

41. Sustainment. This area includes projects pertaining to the sustainment of the soldier, systems and operational formations. Current 'Combat Support' projects would typically fall in this area.

a. Forward log bases

b. Pre- positioning

c. Op tempo

d. Multiple – line s of support

e. Asset tracking

f. Hardened logistical system

g. Log system on internal and external lines of communication

h. JIM log system

i. Host nation support

j. Civilian contractors

k. Organic, intermediate and depot level log system

l. Replace vs fix enhanced available

m. Air-drop technologies

n. Ergonomics/medical

o. Replacement and re-enforcement.

TYPES OF TECHNOLOGY PROJECTS

42. Grouping of Technology. Technology projects must, for the purpose of this strategy, be classified in the following three groups:

a. Basic Product Improvement Technologies

i. The technology projects in this group are primarily focussed on the ***capability enhancement*** of an ***existing*** vehicle fleet. The improvements are mostly incremental along the S-curve, the projects are short term (1-3 years) and the funds required are small compared to the other two types of technology projects. In terms of skills, basic engineering is required, and the old technology on the vehicle is improved and/or replaced.

ii. Typical projects are the development of a new landmine protected driver seat for Rooikat, the development of a new ballistic louver for Casspir, or the improvement of a water purification system by the installation of new technology filters.

iii. Basic improvement technologies are mature when the project is completed and the resulting development can be immediately inserted into an acquisition project.

b. Advanced Capability Improvement Technologies

i. These technologies are aimed at the ***radical improvement of a capability***, such as the development of an electromagnetic damper that can improve ride comfort and use the energy of the damping process to charge the batteries of the vehicle.

ii. The projects are longer term (minimum two years) and should be funded and contracted over the complete time required to complete the project in order to prevent technological obsolescence (as was the case with landmine protection, semi-active damping, ballistic louvers, terramechanics, lighter materials development and many others).

iii. Advanced capability improvement projects require applied research, and should first be proved through simulation, followed by laboratory experiments and technology demonstrators.

iv. The technology is generic and not developed for specific PME, but rather to enhance existing knowledge by systematically building knowledge on previous knowledge. For example, a vetronics system can be proven on a

smaller 4x4 vehicle rather than on a large 8x8 vehicle, the purpose is to mature the technology for later use in a comprehensive acquisition programme.

v. Advanced capability improvement technologies are aimed at programmes that are in the early stages of the acquisition process and should be ***developed concurrently with a specific project*** and inserted when the desired level of maturity has been reached.

c. Knowledge Enhancement Technology Projects

i. The purpose of knowledge enhancement technology projects is to ***evaluate emerging technologies*** by purchasing, integrating and evaluating products or components, either in the laboratory or integrated into a technology demonstrator. A typical project is electric transmission, where a technology scanning process has indicated that this technology is being increasingly evaluated and promoted overseas.

ii. The output of such a knowledge enhancement project should be a complete performance and technology readiness report, clearly indicating the potential benefits (cost, schedule and technical) of the new technology for the SA Army and the FES. The results of a knowledge enhancement technology project would determine if and when the specific technology can be inserted into an acquisition process, depending on the cost effectiveness of the technology compared to the technology that it replaces.

RECLASSIFICATION OF EXISTING TECHNOLOGY PROJECTS

43. The existing technology projects funded by the DOD must be re-classified into the different groups.

44. The majority of the current projects listed on the Landward Technology Master Plan can be defined as product improvement projects, which indicate that very little fundamental research in order to enhance existing knowledge is being funded.

45. A number of the projects are related to support functions ***which can not be classified as technology*** **in its pure sense**, or a service that should be provided by an organisation due to the nature of its business such as simulation services. This can only be classified as technology if new codes or solution methods are developed, but if standard commercially available software is used ***then the project can not be classified as a technology project.*** If these organisations have to be maintained for 'strategic' reasons, funds other than technology funds (ie operational research) have to be used for this purpose.

46. The majority of the advanced capability enhancement projects are listed in the firepower technology area, with no projects in the areas of command and control or sustainment.

TECHNOLOGY MANAGEMENT AND CONTROL

47. DRDB/ATAS Structure. The overall purpose of technology management as executed by the SA Army and the DRDB/Armscor is to access the right technologies at the right time to meet the needs of the SA Army. As such, the existing management process followed by the SA Army for the planning of armaments, as well as the process followed by ATAS to determine the applicability of a technology project, should still be adhered to. However, a different approach has to be followed to identify suitable technology projects and the total landward defence technology portfolio (which ***has*** to be aligned with Vision 2020), as well as suitable contractors to execute the projects.

48. White Papers. It is well known that the White Paper on National Defence states that

defence science and technology is an important part of government funded Science, Engineering and Technology Institutions and that it should be managed in such a way that the objectives of a balanced, modern, affordable and technologically advanced military force be supported. Furthermore, the White Paper on Science and Technology[4] clearly states that the maintenance of a strong technology base is therefore a prerequisite for the new SANDF strategy. This strong technology base must serve the following purposes:

a. ***Maintain*** the capability to detect threats.

b. ***Be aware of trends*** in military technology and their implications for the SANDF (in other words scan the technological landscape).

c. ***Be capable*** of producing technology demonstrators that can rapidly be turned into military technology if necessary (in other words technology demonstrators should be used to demonstrate the suitability of technologies).

d. ***Be capable*** of providing expert advice for procurement purposes.

e. ***Provide*** test and evaluation services.

f. ***Support*** upgrade and maintenance activities.

49. Defence Evaluation and Research Institute (DERI). Following on the above, the White Paper on Defence Related Industries[5] then defines the concept of a Defence Evaluation and Research Institute (DERI) for the retention and development of strategic capabilities that are of importance to the DOD. A DERI, which is based on a similar approach in technologically advanced countries, would therefore, as an ***impartial*** technology advisor to the DOD, support the DOD in being an informed or smart buyer and user of equipment. Typical roles of a DERI include the following:

a. Technical, operational and acquisition support to the SANDF.

b. Test and evaluation.

c. Focussed research and evaluation.

d. South African military product development and maintenance.

e. Technical support for other state institutions.

50. SADERI. The concept of a SADERI is promoted, which entails an alliance between companies such as the Defence Institute, Institute for Maritime Research, Protechnik (Human Support) and specific Armscor test and evaluation facilities such as Gerotek and Alkantpant.

51. DERI - Implications and Risks. Although the concept of a DERI or SADERI is supported and should be included in an overall DOD Technology Strategy, cognisance of the following should be taken:

a. A DERI ***cannot*** be independent if it provides acquisition support to the SANDF and still have the role of 'military product development and maintenance'. This is a contradiction in terms.

b. Although the concept of a DERI is used in countries such as Australia, the

[4] White Paper on Science and Technology, Preparing for the 21st Century; Department of Arts, Culture, Science and Technology.

[5] White Paper on Defence Related Industries, 1 Dec 1999.

Netherlands and Singapore, it should be taken into account that the defence budget of these countries is significantly higher compared to the South African budget. South Africa is to be benchmarked against countries that have a ***similar economy*** and a ***similar defence budget***.

c. The concept of a DERI has been significantly changed in the United Kingdom with the creation of QinetiQ, which has been split from DERA (now know as DSTL or Defence Science and Technology Laboratory). The British Government has sold a significant portion of its shares in QinetiQ to the Carlyle Group, and QinetiQ will be privately owned in future.

d. QinetiQ today is one of Europe's largest research organisations, employing approximately 9,000 people and has a turnover of approximately £800m. The company ***competes*** on the world stage, providing a broad range of services, consultancy advice and test facilities to both the MOD and a wide range of commercial customers.

e. It is ***not*** mandatory or obligatory to create and continuously fund a DERI or even a SADERI, but limited/minimum funding may be required. The current Landward Technology Budget is limited and should be used for the development of technologies that support Vision 2020, rather than to duplicate capabilities at DERIs that are already in place in the local industry, or to pay the salaries and overhead costs of a physical organisation that either does not have the in house capability to execute projects and has to ***subcontract industry*** in any case, or does not provide a significant and measurable technological return on the financial investment made.

f. A balance must be struck between critical masses and bodies of knowledge. Both are an essential ingredient of the total body of knowledge.

g. The concept of a ***virtual*** DERI is more appropriate where Armscor can identify the most ***cost effective*** contractor or organisation to support the SA Army with the roles of a DERI ***as and when required***. Armscor should therefore take responsibility to manage and co-ordinate the different technology clusters to the best advantage of the SA Army. Salient issues such as an impartial and acceptable business model, with appropriate resources, compatible to the SADERI concept of the future, must be exploited.

h. Any company that has the required expertise, knowledge, infrastructure and capability should be allowed to provide any of the roles of a DERI to the SA Army/DOD/Armscor. The cost of using an independent organisation solely for this 'independent' purpose cannot be justified. Furthermore, the formal Armscor acquisition process has to be rigorously applied and will identify organisations that are not independent when tendering on contracts.

SA ARMY TECHNOLOGY STRATEGY MODEL

52. Technology Strategy Model. The following model (figure 5), which is a combination of various technology strategy models as provided in applicable documents [6] is therefore adopted that can be used to select, contract and manage technology projects in the landward environment.

[6] Khalil T; Management of Technology – The Key to Competitiveness and Wealth Creation, McGraw-Hill International, 2000.

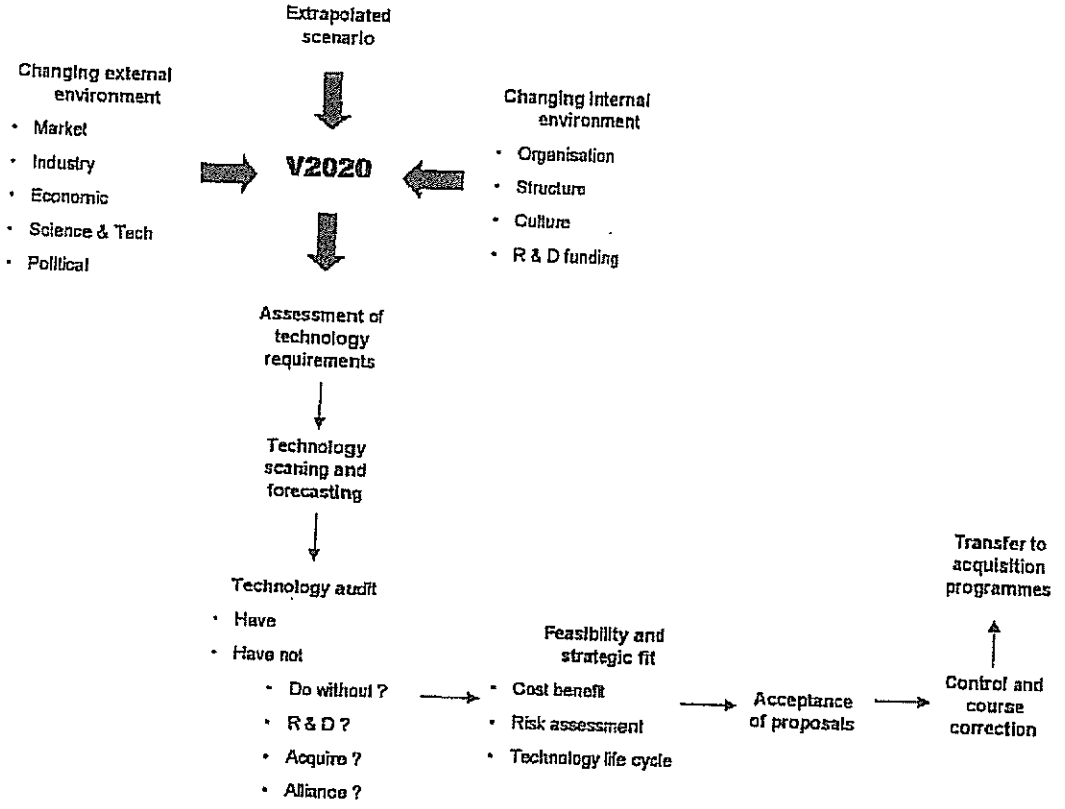

Figure 5: Technology strategy model

53. Application of the Model. The strategy model entails the following:

a. Internal/External Environments. Vision 2020 has been developed and is influenced by the internal and external environments and can therefore change if the internal environment, the external environment or both environments change.

b. Vision 2020. An assessment has to be made of the technologies required to comply with the requirements of Vision 2020.

c. Scanning. The technological landscape has to be scanned and monitored to determine the trends and the availability of the required technologies.

d. Audit. A technology audit has to be performed, during which it is determined if the technology is available to the SA Army/DOD/Armscor or not. If not, the SA Army/DOD/Armscor must decide whether to do without the technology (the do nothing alternatively), develop the technology (using either a basic product improvement or advanced capability improvement approach), purchase the technology following knowledge enhancement technology project approach, or to enter into an agreement with an external organisation to jointly develop the technology and to share the costs (as well as the IP and resulting profits if the technology is commercially successful).

e. Scientific Approach. The execution of such an audit should be done in a scientific way following internationally accepted techniques and procedures, and not be based on perceptions such as that 'we have been doing this for years and are the

world leaders in this field'. Benchmarking against other technologies, using information obtained from the technology scanning process, should assist in this task.

f. Decision-Taking. The decision has to be measured against the overall technology policy and cost-benefit and risk analysis pertaining to the funding of the technology has to be made. The position of the technology on the technology life cycle curve (eg the maturity of the technology before investment) also has to be taken into account.

g. Tender Process. The formal Armscor tender process will then be followed to select a suitable contractor, after which the contract is placed and Armscor executes a control and course correction function. The contractor will be chosen based on the required level (high or low technology) of for the specific technology that has to be developed.

54. Role Players wrt Technology and R&D Management. In the absence of an optimized joint DOD technology business and management model, the effective coordination of SA Army technological and R&D requirements is most challenging. As the SA Army cannot prescribe how technology development has to be managed in the DOD, the Army has adopted a framework of areas of responsibilities for future optimisation. Meanwhile existing management structures need to be optimised as follow:

a. AC. The AC **approves and controls** all technology and R&D/OR requirements and will therefore approve an annual SA Army Technology Requirements Plan to be submitted to the DOD. The AC focuses on **what** must be achieved in terms of the Landward Defence Capability (interface with decision making wrt the Mil Strat, FES and VISION 2020).

b. LDCB. The LDCB, assisted by SA Army planners serving on appropriate Levels 2, 3 and 4 Forums, invokes, creates and develops future war fighting concepts, translates it into battle space effects and specific Army application. The LDCB focuses also on the "what", but from a **specialist advisory** perspective (output is advice to the AC on all levels of war).

c. SAAAC. The SAAAC as directed by the AC, in particular serves as the Level 2 forum, which **manages technology** on behalf of the SA Army. It is the single entry point for the identifying and aggregating enabling landward technologies. The focus is on **who** must receive **what** product systems/technologies, **when** and **how** (interface with equipping the SA Army – emphasis on armament planning).

d. C Acqn. Once approved by the AC, technology requirements will be submitted annually to C Acqn (DAPD) for development and further processing via the DRDB management structure and processes. Based on current DOD processes, it is assumed that C Acqn (DTD) will translate the SA Army technology requirements into appropriate enabling technologies and prepare PDs for approval and placing contracts once approved by the AACB/AASB.

e. DI. DI is the **executive and co-ordinating agency** of the SA Army for R&D/OR. The focus is primarily on system level 6 and 7 operational research and analysis. This which addresses the **ends and ways** (not the means) such as concepts, doctrine and tactics etc of a Force Structure Element/User System/SA Army Capability (interface with Armscor/DERI for outsourcing and Level 3and 4 for in-house SA Army operational research requirements).

CONCLUSION

55. The above mentioned strategic guidance and technology requirements serve as a strategic

input from Syndicate 1 to the SA Army. The underlying intention is to provide appropriate Level 2 guidance in order to guide technologies that are required to support SA Army armament acquisition projects and the joint landward defence capability for the future battle space.

(A. KOTZE)
SSO ARMAMENT PLAN: COL

(B.C. GILDENHUYS)
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Feedback Syndicate 2

RESTRICTED

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8 April 2008

SYNDICATE 2 FEEDBACK: TECHNOLOGY WORKSHOP

1. The RSA is regarded as yellow ito technological development and this therefore implies that foreign owned companies own most of intellectual Property and this requires the SA Army to be a clever follower.

2. Funding will always influence the what, ito technology to be purchased, the SA Army must thus endeavour to identify and prioritise which technology enhancing capabilities it requires.

3. Most technologies are available as COTS/MOTS, but these will not always provide solutions, and their guaranteed availability and rack life is questionable, it is therefore imperative to produce or develop niche capabilities that will provide a competitive advantage during operations.

4. To maintain an element of surprise, some technologies and parallel doctrine, must be internally developed and the IP be protected at all costs.

5. Most of technologies take time to produce from conception to production, it is therefore critical to identify what attributes are required and these should be clearly defined to the industry, prior to committing any funds.

6. As conflicts are moving away from linear to more asymmetric, it must be assumed that OPFOR or belligerents will also have access to more advanced technological equipment available and the SA Army needs to remain competitive!

7. Changes in the technological field are happening fast, therefore it is imperative to limit time of investigation (project), to avoid producing outdated equipment that is expensive but already obsolete.

8. Technological developments must take into consideration the operating systems of protection, firepower, manoeuvre, sustainment and C^2, to ensure that they provide soldier effectiveness, protection, comfort and satisfaction.

9. Modeling & Simulation will play a major role in all facets of training, therefore a major portion of funds must be invested in this regard. It should not only address training but must be utilised for operations as well.

10. Technology must be utilised to enhance equipment and not the other way around, therefore robust doctrine is required to lay the foundation, and give direction on what to acquire.

11. Although the SA Army approach is to structure and equip for the primary role it is important that most technology available, can also be utilised for OOTW.

12. The need for an integrated DERI is confirmed and the SANDF (SA Army) should endeavour to become an integral part of such an institution. Presently the SA Army is totally reliant on organisations like DI and DPSS for outputs whilst it is not capacitating its own Body of Knowledge (BoK).

13. Summary of Pointers

a. Build, capacitate and retain a technological BoK down to unit level (appoint champions).

b. Master and employ existing forums and technologies.

c. Use C^2 technology as cost saver, especially wrt TEWT.

d. Invest in M & S opportunities, especially for scenario building and action plans.

e. Technology is not necessarily expensive; it is readily available; plan, fund and utilise, give feedback and improve.

f. Emphasis must be placed on development of non-lethal weapons in order to address future rural challenges.

g. Plan to be pre-emptive ito development and not reactive.

h. Plan and prepare for Africa and African challenges.

i. We have a DERI capability, why not fully use it?

14. Many of other potential points of interest were covered by other presenters and were thus not presented again. The syndicate did cover detail ito specific areas of technology utilisation (employment) wrt concepts given to consider.

(COL C.R. LINDSAY)
SYNDICATE 2 LEADER: BRIG GEN

Feedback Syndicate 3

SYNDICATE 3: TECHNOLOGY WORKSHOP MAIN INTEGRATED CONCLUSIONS

INTEGRATED MAIN CONCLUSIONS

Structuring for Capability and Technology Development.

- Establishment of a Joint Concept Development Centre. JIM focus, SANDF controlled ito concepts.

- Establishment of SA Army Combat Development Centre/Directorate. It should be structured within GS3, responsible for defining future concepts for landward operations, to define joint combat organizations, to define future families of platforms/systems, define specific platform requirements, and to define technology requirements. This centre/directorate will make use of decision-support in respect of simulation and experimentation.

- Establishment of SA Army Integrated R&D Centre. Grouping of current functional R&D offices at all the current formation HQs into one integrated centre.

Notes.

- Joint Combat Development Centre and R&D Centre to make use of the LDCB as forum.

- Combat Development Centre is to provide the SA Army's component to the joint concept development centre.

- The SA Army R&D Centre to provide the Army's formal link to external technology development organizations

- Proposed **Process** for SA Army Combat Development. Top-down process:
  - Formulate concepts of operations
  - Determine joint combat organizations
  - Families of platforms/systems
  - Specific (Service) platforms
  - Technology required
- Establishing a routine communication system between R&T institutions and the SA Army. For example the LDCB and other forums.

- Operational Operating Systems as **Framework** for Technology Development. The framework of the operating systems to be used as framework for technology development.
    - Movement and Manoeuvre.
        - Mobility and Manoeuvre. Mobility and manoeuvre to be considered in respect of strategic, operational, tactical (including various forms of mobility and manoeuvre within an area of operations) and critical, as well as all forms of mobility and manoeuvre (lowest form of individual soldier movement).
    - Protection. A study must be done to analyse the spectrum of available and new technologies that can support the concepts of operation pertaining to protection.
    - Command and Control.
    - Sustainment.
        - Air delivery technologies important in view of given aircraft platforms (A400M)
        - Requirement for technology development of operational logistical systems.
        - Logistical Footprint. Reduce the overall logistical footprint bmo various technology programmes. Standardised equipment with greater quality, better serviceability and greater reliability should be designed. Systems will require less maintenance, consume fewer commodities and can provide self-reporting prognoses. Through demand reduction, improved reliability and maintainability, supply support activities and requirements will be reduced.
        - Asset Visibility. Systems like bar-coding, radio frequency response tags, miniature global positioning systems and position-reporting transmitters should be instituted to enhance real-time asset visibility.
        - Vehicle-based roll-on-roll-off approach to be followed for a family of platforms for all systems to be found in a joint landward task force (for specific use in sea-landed operations). Modular logistical

packages should enhance flexibility and agility and simplify sustainment requirements.

- Firepower.
    - Less-than-lethal weapons technology should be a high priority ito funding
- Intelligence.
    - Aerostats, UAVs and Unmanned Ground Vehicles (UGVs). SA Army to define its concepts for aerostat, UAV and UGV utilization at different levels of command

OTHER INTEGRATED MAIN CONCLUSIONS

- JIM Telecommunications Interoperability. A strategic decision must be made wrt SANDF and RSA government departments ito telecommunications interoperability, with specific reference to command and control, IT, tactical, technical and specific EW requirements. South Africa must develop its own satellite capability to support such interoperability. The spectrum management capability must be addressed including telemetry.
- Implication of Technological Development in Weapon Systems. As a result of integration between mechanical en electronic technology in PME, telecommunication and electronic aspects to be determined/split ito responsibilities between the TSC and ICT.
- Technology to Support Training. Requirement for specific technology development in support of training. For example e-learning, net-enabled simulation, KMS etc.
- Spectrum of Technologies. The SA Army is to obtain visibility over the full spectrum of technology development, firstly to be informed about the spectrum of technologies and secondly to prioritise its own strategic interest in respect of specific technologies. Determine which technologies should be SANDF only.
- Acquisition Process. Urgent attention is to be given to define a drastically shortened acquisition process, especially iro GOTS, COTS and MOTS.
- Immediate Operationally Urgent Solutions. Requirement for an organisation to provide immediate solutions (product) to operationally urgent problems.

- Landward Night Fighting Capability. The SA Army is to refocus on its night fighting/surveillance capability and direct specific technology programmes towards this capability.

- Vehicle Technology. Current and historic focus on wheeled vehicle systems to be maintained. Apart from military technology development the focus is to be shifted towards the integration of commercial technology as well. For example, suspension technology. The development of vehicles must include the ergonomics for telecommunications.

- Navigation and GPS. The SA Army is to formulate a policy to regulate the use of GPS and should field a standard system.

INPUTS TOWARDS SA ARMY TECHNOLOGY STRATEGY

- SA Army combat development process to be implemented out of which technology requirements are to be derived.

- *Utility of this approach:*

    - Jointness
    - Doctrine-driven combat development
    - Experimentation
    - Standardisation
    - Scientific research
    - Process suited to the Vision 2020-transformed Army structures
    - Direction and prioritization of capital acquisition projects

Feedback Syndicate 4

MEMORANDUM

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7 March 2008

From: D Army Doctrine and Policy
To: Vision 2020 Team Leader

SYNDICATE 4: FEEDBACK ON THE LANDWARD TECHNOLOGY SEMINAR

INTRODUCTION

1. The Landward Technology Seminar has successfully demonstrated the influence of available (and future) technology on possible future concepts of operations and training methodics.

2. The future requires that strat decision makers are extremely well-informed about what is technologically possible, what is required, what is realistic and **how these could be integrated in required capabilities.**

3. Future adversaries (whether a conventional enemy or OOTW OPFOR) are likely to think and act in an asymmetric nature. They will have the ability to acquire the latest technology far quicker that conventional militaries and will deploy a wide range of old military and new **civilian and military technology**. Despite the fact that their highly innovative use of technology is likely to surprise own forces, the SA Army will be unwise to enter into a technology race with them (or anybody else).

4. The crucial decision of and critical success factor for the future Landward Technology Strat is to identify appropriate technology areas that will **continue** to provide the SA Army with selected and clearly defined winning edges. Central to this is the agility of the Landward Capability acquisition process to absorb military and commercial technology innovations off the shelf.

5. It is essential that landward technology be seen as but one element of the Landward Capability. **Balance** between all elements of POSTEDFIT remains the CSF.

6. As with Seminar 21, it is significant that most lecturers emphasised the fact that, despite the extremely important role of technology on the (future) battlefield, human knowledge, skills, attitudes and experience remain paramount for tactical success.

AIM

7. To provide Syndicate 4's feedback on the Landward Technology Seminar.

SCOPE

8. Feedback is provided on the SA Army Strat, the Mil Strat Objs, and the Mil Strat Concepts and concluded with pointers for the development of the Landward Technology Strat.

THE SA ARMY STRAT

9. Points of Departure. The following aspects are considered to be fundamental in formulation the Landward Technology Strat:

a. Systems' capability for close combat.

b. Protection, fire power and mobility in a complex environment.

c. Factor strat time.

d. The own forces and OPFOR human element.

e. The requirement for regional security.

f. An effects-based appreciation.

g. Maintaining systems thinking.

h. Acceptance of little early warning, long distances, complex environments, and a very knowledgeable, flexible (high tech) and innovative OPFOR.

i. Striving for a favourable public image.

10. DOD Policy and SANDF Strat. The following policy, strat and doctrine support from higher HQ are required:

a. Guaranteed strat early warning for conventional war.

b. Policy decisions to create the environment to establish a balanced POSTEDFIT landward capability.

c. Decisive decision-making to ensure members' social health.

11. Landward C^2

a. Retain the conventional warfare paradigm for the extended long term.

b. For the medium to long term, however, the SA Army is to allow an OOTW approach to shape its structuring, staffing, equipping and training.

c. Plan for counter-asymmetry.

d. Take a firm decision on whether the Landward Capability is to be a technology leader/buyer/combination of.

12. Landward F Struc

a. Structure, staff and equip for JIM-ness.

b. Integrate asset, product systems and capability management.

13. Landward F Prep

a. Deliberately re-vitalise Landward Doctrine and SA Army Policy.

b. Train for counter-asymmetry scenarios.

c. Execute training in an IW, CBR, CBT etc environment.

d. Invest in (computer supported) modelling, simulation, experimentation and decision-making support.

e. Tailor course contents and methodics to produce knowledge, skills and attitudes for the future battlespace.

14. Landward F Sustainment

a. Introduce deliberate and decisive systems and processes to improve on pers selection, administration, maintenance and management.

b. Integrate sustainment systems from the 1st to the 4th line.

THE MIL STRAT OBJS

Ser No	Strategic Obj	Recommendation
	a	b
1	Protect the sovereignty and territorial integrity of the RSA	Retain as core driver but re-prioritise for the extended long term
2	Contribute towards peace and stability in the region and the continent	Allow to influence SA Army medium to long term structuring, staffing, equipping and training
3	Protect external vital interests	Retain
4	Defend and protect the homeland	Re-prioritise to the same level as conventional war
5	Maintain a peacetime reserve for employment by C SANDF	Retain
6	Contribute towards government's socio-economic development and upliftment initiatives	Retain
7	Contribute towards deterrence and prevention of conflict	Re-appreciate intention, method and outcome to shape deliberate and unstructured (natural) methodics
8	Counter-asymmetry	Include in daily force struc, prep and sustainment paradigm

THE MIL STRAT CONCEPTS

Ser No	Strategic Obj	Recommendation
	a	b
1	Sup to Government Depts	Formalise and enforce both by the DOD and to the DOD

2	Rear Area Ops	Re-prioritise to the same level as conventional war
3	Regional Alliances and Coalitions	Guide Government and adopt an action plan for implementation
4	Show of Force	Re-appreciate intention, method and outcome to shape deliberate and unstructured (natural) methodics
5	JIM Ops	Adopt a deliberate JIM force struc, force prep and force sustainment action plan for implementation
6	Relevant Force Development and Preparation	Become serious

LANDWARD TECHNOLOGY STRAT: POINTERS FOR DEVELOPMENT

15. C^4I^3RS Technology Pointers

a. Develop defence C^4I^3RS as an **RSA-own** system that allows networking from sec level up. Structure, staff, equip, train and practice for IW with tailored counter and counter-counter capabilities.

b. Invest in technology-enabled GS/DS/BS/US. planning, **orchestration** and control capabilities for peace, OOTW and war.

c. Structure, staff, equip and train for command of JIM forces with systems enabled tac level C^4 in deep, close and rear areas.

d. Main comm and IT systems' security and serviceability.

e. Plan IPB in advance and invest in infrastructure to allow effective deployment of deep, close and rear surveillance and recon technology. Optimise the mix of **HUMINT** and sensor-based int.

f. Integrate the strat, op level and tac level int systems into one whole. Design appropriate filters per level of command to prevent info overload.

g. Design, develop and invest in a **counter-asymmetry int system** based on technology-driven personnel IFF and language, ethic, cultural and religion int collection, processing and dissemination.

h. Invest in technology for terrain digitisation and modelling.

i. Manage the Landward Technology Plan to annually direct the DEIS Masterplan.

16. Manoeuvre and Mobility Technology Pointers

a. Retain the family of vehicles concept (either own design or MOTS or COTS) but include future coalition partners' requirements.

b. Invest in technology to enhance force projection over strat, operational and tac distances (air, sea, land, rail, brown water).

c. Focus on GIS, gap/obstacle crossing, airfield construction/maintenance and complex terrain mob technologies.

d. Decide on specialised technologies to ensure **dominant manoeuvre** in complex natural and man-made environments.

17. Firepower Technology Pointers

a. Invest in target acquisition technologies and enhanced joint and multinational effect integration and damage assessment to contribute to **networked firepower from pl level up**. Plan for technology enhancement for joint and multinational battlefield sensors (UAV etc), MFC, FOO, FAC, CSH and NGS.

b. Focus, for the medium term, on specialised (lethal / LTL / NL) firepower technology for OOTW and technology to ensure lawful firing decisions from sec level up.

c. Plan for specialised (reduced effect / urban / low CEP / top attack / thermobarics / EMP / soft launch) technology for complex conventional and OOTW warfighting.

d. Decide on autonomous decision-making (IFF) technology for access denial during conventional and OOTW in urban and rural environments.

e. Retain the South African **IFS winning edge** by adding tailored clever ammu (with in-flight adaptability) technology for selected IFS assets.

f. Invest in selected counter-fire technology (active measures) and technology (also chemical) to increase the effectiveness of next generation explosives, propellants and pyrotechniques.

g. Invest in **extended range, precision deep strike technology** (250,000m) as well as close fire support technology.

18. Protection Technology Pointers

a. Focus on deployable data recording technology to ensure **legal protection** of lawful decisions and actions during (especially) OOTW.

b. Investigate technological enhancement of pers protection and survival against CBR and next-generation mines in **complex warfighting.**

c. Urgently invest in technology to allow safe mine clearance, protection against top attack, effective camouflage and concealment, a **night fighting capability** and ESM.

d. Decide on investing in counter-asymmetry technologies.

19. Sustainment Technology Pointers

a. Urgently invest in technology to **unemotionally manage soft issue systems and processes** like pers selection/assessment and career management.

b. Urgently invest in technology to establish and maint **precision sustainment systems and processes** that include pre-/forward positioning and fraud-proof local procurement.

c. Plan for technology to electronically manage logistic supply, demand, storage, distribution, tracking and tracking and life-cycle management of vehicles, ammu and stores (also for coalition partners).

d. Investigate technological enhancement of **water** drilling, purification, bottling and storage capabilities. .

e. Investigate technology applicable to **disaster relief and humanitarian sup** like quick fix infrastructure repair and (re-) construction.

f. Plan for the technological sustainment and development of the **landward intellectual basis.**

g. Manage the Landward Technology Plan to annually direct the sustainment of / investment in the local defence industry.

20. Training Technology Pointers

a. Invest in selected doctrine development (lessons learnt, experimentation, electronic dissemination and interaction) and virtual and live training support technologies.

b. Investigate technological solutions for the **scientific measurement and certification of units' combat readiness.**

21. JIM Technology Pointers. The Landward Technology Strat must be fully integrated with the Defence Technology Strat that should be designed to create the environment for landward technology success. The following aught to be JIM or, at least, joint technology requirements/environments:

a. Strat and operational level C^4I^3RS.

b. **Strat early warning** and IW.

c. Strat deep interdiction.

d. Appreciated air and littoral supremacy and protection during tac, op, strat air/sea lift ops.

e. **Strat sustainment** inclusive of $4^{th}/5^{th}$ line support and pre-positioning / forward positioning.

f. Mil health and strat comm support.

g. Negotiated international legal framework for deployments, inter-departmental coordination, host nation support and national strat resource utilisation.

22. General Technology Pointers

a. Decide on and stick to a Landward Technology **weight class.**

b. Guide RSA defence industry and invest appropriately.

c. Create a landward **family of technologies.**

d. Create a Landward Technology System that will keep track of what is

technologically possible/available and keep on advising decisionmakers.

e. Decide on networked warfare.

f. Influence non-SA Army (ie defence) technology development.

g. Finalise the SCAMP.

h. **The human factor: Protect the art of warfare.**

CONCLUSION

23. Technology is an extremely important combat enabler but can not and should not be thought of as the solution for weaknesses in other elements of POSTEDFIT. Only a well-designed, well-balanced and well-prepared **system** will make a landward difference.

(J.D. MALAN)
SYNDICATE LEADER SYNDICATE 4: BRIG GEN

Minutes of the SA Army Technology Workshop at the CSIR Innovation Hub on 20 March 2008

SA ARMY OFFICE/R/303/3

MINUTES OF THE SA ARMY TECHNOLOGY WORKSHOP AT THE CSIR INNOVATION HUB ON 20 MARCH 2008

PRESENT	Appointment
Maj Gen L.M. Dlulane	C Army F Struc
Maj Gen R.Z. Mandita	GOC ASF
Maj Gen V.R. Masondo	C Army F Prep
Maj Gen T.M. Nkabinde	GOC Inf Fmn
Maj Gen L. Rudman	C Army Corp Svcs
Brig Gen D. Jelliman	D CMI Reserves
Brig Gen H.J.G. Kamffer	D Pol & Plan AR
Brig Gen A. Luck	D Army M and RS
Brig Gen J.D. Malan	D Army Doc and Pol
Brig Gen V.A. Nelwamondo	GOC Army Training Fmn
Brig Gen J.G. Nkabinde	IG SA Army
Brig Gen L.C. Nobanda	GOC Engr Fmn
Brig Gen M.R. Notshweleka	GOC Arty Fmn
Col C.B. Bosiki	SSO Cpln Svc
Col H.D. du Plessis	SSO R&D
Col E.F. Drost	Project Leader
Col H.P. Grobler	Project Officer
Col A. Kotze	SSO Armament Plan
Col C.C. Laubscher	SSO ETD
Col C.R. Lindsay	A/GOC ADA Fmn
Col R.G. Lourens	SSO Combat Readiness
Col R.M. Marais	SSO Log Plan
Col G.M. Mostert	SSO Signals Migration
Col E. Muller	Army Sup Fmn
Col P.J. van Dyk	OC ASB Potchefstroom
Col B.J. van den Berg	2IC ASB Bloemfontein
Col N.D. Swartz	SSO CMIS
Col C.J. van der Merwe	A/GOC HQ 43 SA Bde
Lt Col E. de V. Lourens	Project Officer
Lt Col G. Janse van Rensburg	Project Team Member
Lt Col D.J.L. Labuschagne	SO1 R&D Int Fmn
Lt Col P.I. Moeketsi	Project Officer
Mr A. Nepgen	CSIR
WO1 M.V. Kgaladi	WO Army
Maj E. Jordaan (Secretary)	Project Officer

INTRODUCTION

Action By

1. Welcome and Introduction. Maj Gen L. Rudman welcomed everyone present and highlighted the DOD technology end state.

	Action By
SYNDICATE 4	
2. Presentation. Brig Gen Malan presented Syndicate 4's feedback.	
3. Decisions. The following decisions were made:	
a. Early Warning. The SA Army must plan to prepare and provide forces with little early warning, especially for asymmetric threats. The SA Army must therefore ensure readiness with little early warning for rapid deployments. For conventional threats early warning will be provided by Defence Intelligence.	Vision 2020
b. Conventional Capability. The SA Army must accept the reality of preparing and providing forces for routine PSO tasks without losing its conventional capability.	C Army F Prep
c. Openness of the Military. The SA Army must become more open towards society. It must create opportunities for society to interact with the SA Army even at unit level to promote mutual understanding.	C Army F Prep SSO Army Comm
d. Structuring for OOTW. The SA Army is to allow OOTW requirements to influence some structuring, staffing, equipping and training in the ST and MT.	C Army
SYNDICATE 3	
4. Presentation. Col Laubscher presented Syndicate 3's feedback.	
5. Decisions. The following decisions were made:	
a. LDCB. Selected scientists and engineers, particularly from the CSIR must attend the LDCB.	C Army F Prep
b. Concept of Operations. The SA Army must consider its concept of operations clearly before making priority decisions on technology development. The Vision 2020 concept of operations as formulated must be used as template.	All
c. SA Army Concept Development Centre. An SA Army Concept Development Centre should be established. This centre should make use of decision-support in respect of simulation and experimentation. It should be structured within GS3 and be responsible for defining:	C Army F Prep

		Action By
i.	future concepts for landward operations	
ii.	joint combat organisations	
iii.	future families of platforms/systems	
iv.	specific platform requirements, and	
v.	technology requirements.	

SYNDICATE 2

6. Presentation. Col Lindsay presented Syndicate 2's feedback.

7. Decisions. The following decisions were made:

a.	Concept for Reconstruction. Skills development is often emphasised, but ideas pertaining to a reconstruction capacity are often neglected. The concept of creating a reconstruction capacity needs more attention.	Vision 2020
b.	Ammunition Life-cycle. Technology development should be considered to expand the limited lifecycle of current ammunition in the humid conditions of the Great Lakes region.	C Army F Struc

SYNDICATE 1

8. Presentation. Col Kotze presented Syndicate 1's feedback.

9. Decisions. The following decisions were made:

a.	Technology Strategy. The SANDF must work towards a national and defence-level technology strategy and the SA Army must play a prominent role to ensure that the required landward technologies are addressed.	C Army F Struc
b.	Existing SANDF Technology Projects. SA Army members must be knowledgeable about current SANDF technology projects. Communication periods must be held to ensure awareness.	All
c.	Prioritisation and Optimisation of Funds for Technology Research. The SA Army must not formulate an extensive wish list of technology required as focus. It must rather base its research	C Army F Struc

		Action By
	priorities on a relevant future concept of operations. The SA Army must evaluate the relevance of its current technology projects and optimise the use of funds according to relevant priorities.	
d.	Combine High and Low Technology. The SA Army must use/buy existing platforms and combine them with advanced technology systems to enhance the overall system.	C Army F Struc Fmns
e.	Interaction with the CSIR and other Role-players. There must be formal and informal interaction and sharing of ideas between the SA Army, the CSIR and other technology role-players to ensure that people remain informed and that thinking remains creative.	C Army F Struc

CONCLUSION

10. The meeting was adjourned.

(L. RUDMAN)
CHIEF ARMY CORPORATE SERVICES: MAJ GEN

Date: 28 May 08

Enclosure 1: Presentation Syndicate 4
2: Presentation Syndicate 3
3: Presentation Syndicate 2
4: Presentation Syndicate 1.

DISTR

For Info

Chief of the SA Army (Attn: Lt Gen S.Z. Shoke)

C Army F Struc (Attn: Maj Gen L.M. Dlulane)
DC Army Force Struc (Attn: Brig Gen A.D. Luck)
D Army Prod Sysman (Attn: Brig Gen I.R. Johnson)
D Army Log (Attn: Brig Gen V.M. Mdletye)
D M and RS (Attn: Brig Gen A. Fredericks)
A/D HR Plan (Attn: Col J. Preller)
SSO Armament Plan (Attn: Col A. Kotze)
SSO Sustainment Management (Attn: Col B.G. Harrison)
SSO Log Plan (Attn: Col R.M. Marais)

SSO Renewal	(Attn: Col B. du Toit)
SSO Signals Migration	(Attn: Col G.M. Mostert)
C Army F Prep	
DC Army F Prep	(Attn: Maj Gen V.R. Masondo)
D Army Doc and Pol	(Attn: Brig Gen C.P. van Schalkwyk)
SSO ETD	(Attn: Brig Gen J.D. Malan)
SSO Combat Readiness	(Attn: Col C.C. Laubscher)
	(Attn: Col R.G. Lourens)
C Army Corp Svc	
DC Army Corp Svc	(Attn: Maj Gen L. Rudman)
DASD	(Attn: Brig Gen E.M. Mashoala)
D Army HR	(Attn: Brig Gen M.C.D. Nel)
SSO Strat Plan	(Attn: Brig Gen M.A. Kula)
SSO CMIS	(Attn: Col A. Andrews)
	(Attn: Col N.D. Swartz)
SSO Cpln Svc	(Attn: Col C.B. Bosiki)
SSO Army Comm	(Attn: Col S.P. Zeeman)
CAR	
D Pol & Plan AR	(Attn: Brig Gen H.J.G. Kamffer)
D Army Acq	(Attn: Brig Gen C.H. Roux)
IG	(Attn: Brig Gen J.G. Nkabinde)
Sergeant Major of the SA Army	(Attn: WO1 M.V. Kgaladi)
Budget Manager	(Attn: Mr W.A. du Preez)
GOCs	
SA Army Inf Fmn	(Attn: Maj Gen T.M. Nkabinde)
SA Army Sup Fmn	(Attn: Maj Gen R.Z. Mandita)
SA Army Arty Fmn	(Attn: Brig Gen M.R. Notshweleka)
A/GOC SA Army ADA Fmn	(Attn: Col C.R. Lindsay)
SA Army Armour Fmn	(Attn: Brig Gen B.C. Gildenhuys)
SA Army Sig Fmn	(Attn: Brig Gen L.L. Eggers)
SA Army Engr Fmn	(Attn: Brig Gen L.C. Nobanda)
SA Army Int Fmn	(Attn: Brig Gen J.D. Magasela)
SA Army Trg Fmn	(Attn: Brig Gen V.A. Nelwamondo)
A/GOC HQ 43 SA Bde	(Attn: Col C.J. van der Merwe)
A/GOC HQ 46 SA Bde	(Attn: Col M.J. van Staden)
SA Army Vision 2020 Project Team	
	(Attn: Brig Gen J.J.G. Gibbs)
	(Attn: Col E.F. Drost)
	(Attn: Col H.P. Grobler)
	(Attn: Lt Col G. Janse van Rensburg)