Relevant Military Technology in an African Context

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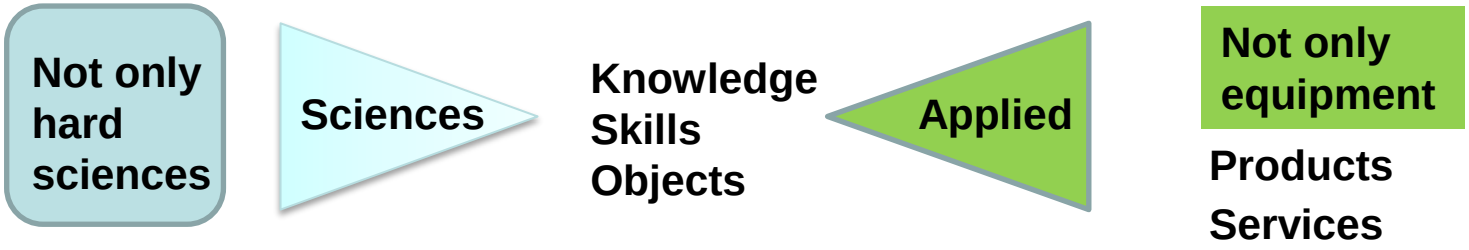
18 Apr 12

Objectives and Scope

- **Demonstrate a long term stable approach for determining technology requirements.**
- **Provide sample data from the application of this approach.**
  - Tactical/technical level.
  - A panel of experts should actually apply it.
- **Provide suggestions for positioning the SA Army Technology Strategy for the future technology environment.**

Reference to the Draft Defence Review is indicate by DDR Ch/par.

Semantics: What is Technology



To put inventions and discoveries to practical use.

Practical use implies innovation. Africa is innovative. Is the military?

Incremental innovation
Eg anti-spalling

Radical Innovation
Eg Active Protection Systems

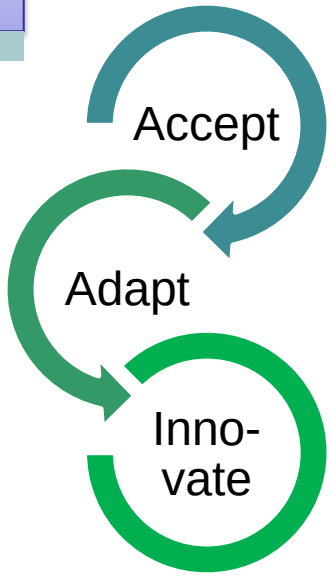
Architectural Innovation
Eg Use awareness to avoid threats

Deducing Technology Requirements

The following factors should have impact for at least a decade.

Exterior Environment		
Changing Nature of Conflict	BRICS Alliance	Defence Industries

Interior Environment		
The RSA League	Defence Review(s)	Planned Missions (Problems)



Discussion of a few major issues on each of the above factors

Deducing Technology Requirements

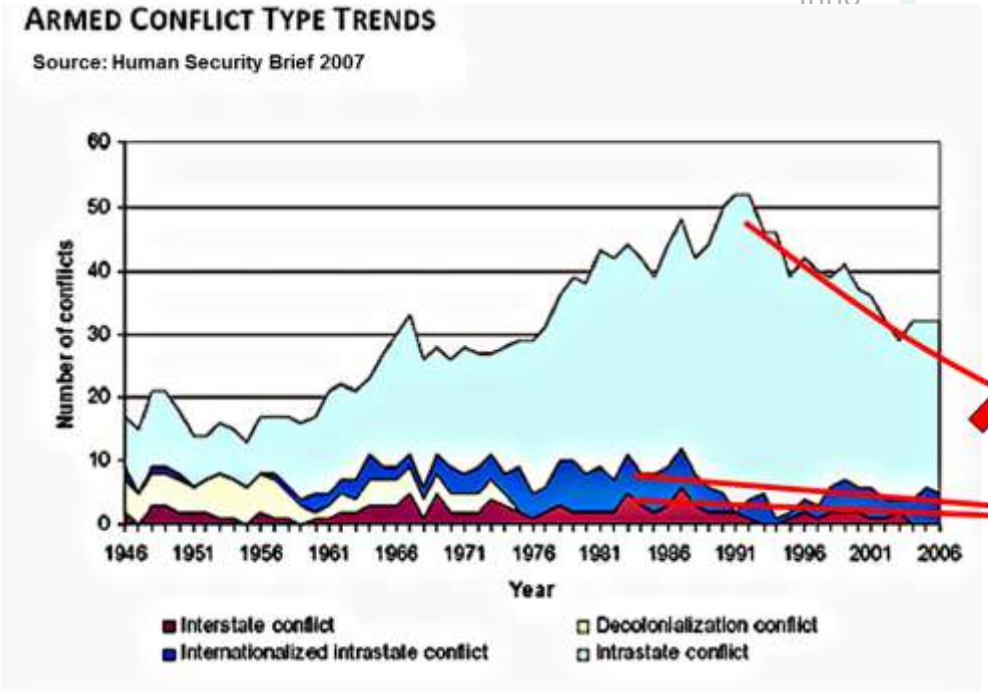
Exterior Environment		
Changing Nature of Conflict	BRICS Alliance	Defence Industries

Accept

Adapt

Inno-

Interior Environment		
The RSA League	Defence Review(s)	Planned Missions (Problems)



Asymmetry

Some long term planners describe the future as "troublesome peace".

Deducing Technology Requirements

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Accept

Adapt

Interior Environment		
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China is not innovative and imports and reverse engineer Russian high technology.
China future focus is not on Army, but on force projection via navy and air force.

Is Russia the critical partner?

- **Excellent space program.**
- **Had an active protection system before the West.**
- **Good weapons in use across Africa.**

BUT

Russia had major technology gaps during its operation against Georgia in 2008 (eg precision strike).
Russia has only 10% modern equipment in its conventional forces.
A major modernisation drive from now to 2020.

How to prevent politics dictating military decisions?
Interoperability based on common eastern equipment in Africa or western C4IRS systems?
In depth study and policy is required.

Deducing Technology Requirements

Exterior Environme

Changing Nature of Conflict | BRICS Alliance | Defence Industries

Interior Environment

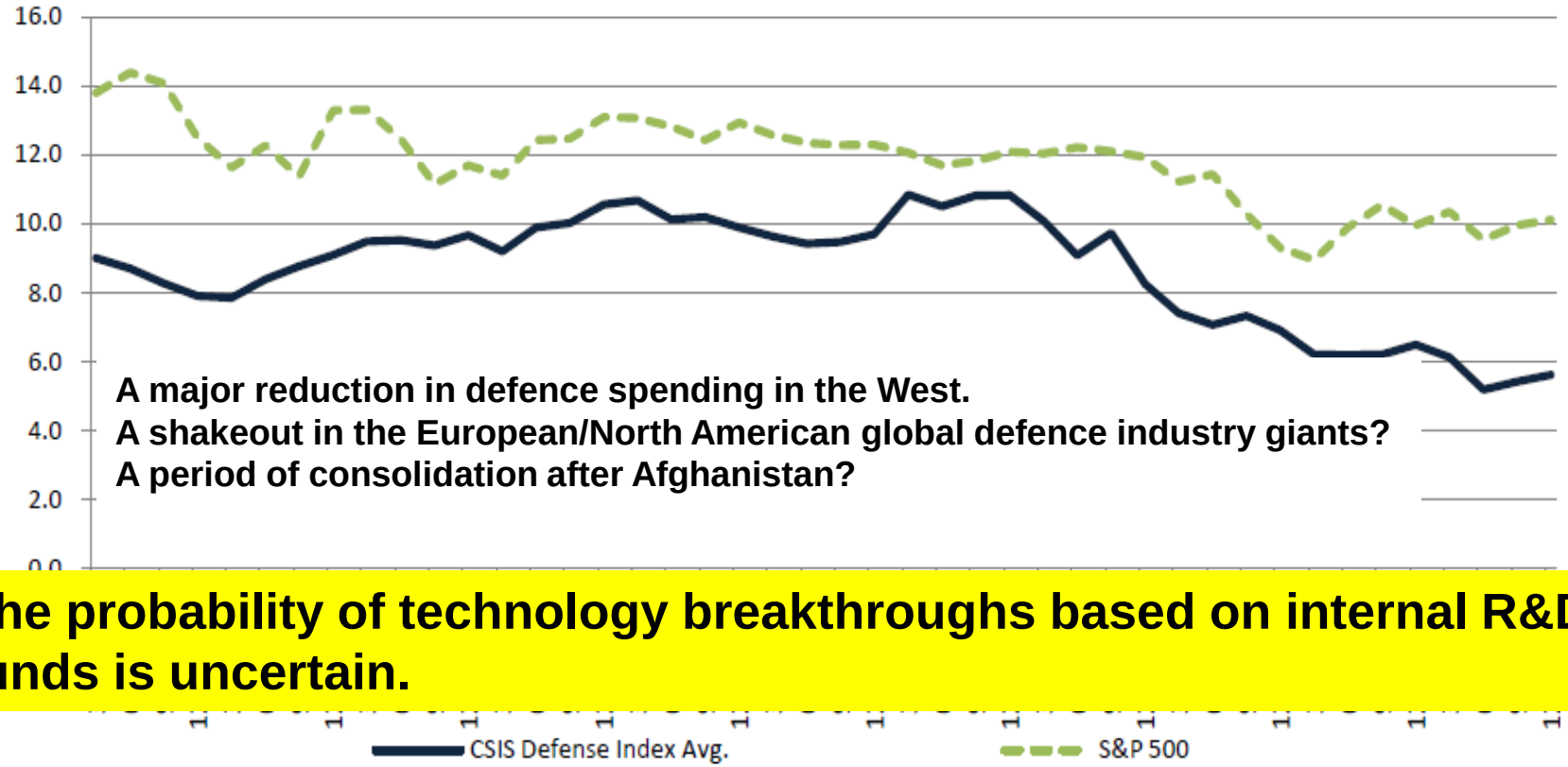
Ac

Adapt

League | Review(s) | Missions (Problems)

Will industry play a major role?

Figure 14: EV to EBITDA Comparison, CSIS Defense and S&P 500 Indices, 2000–2010

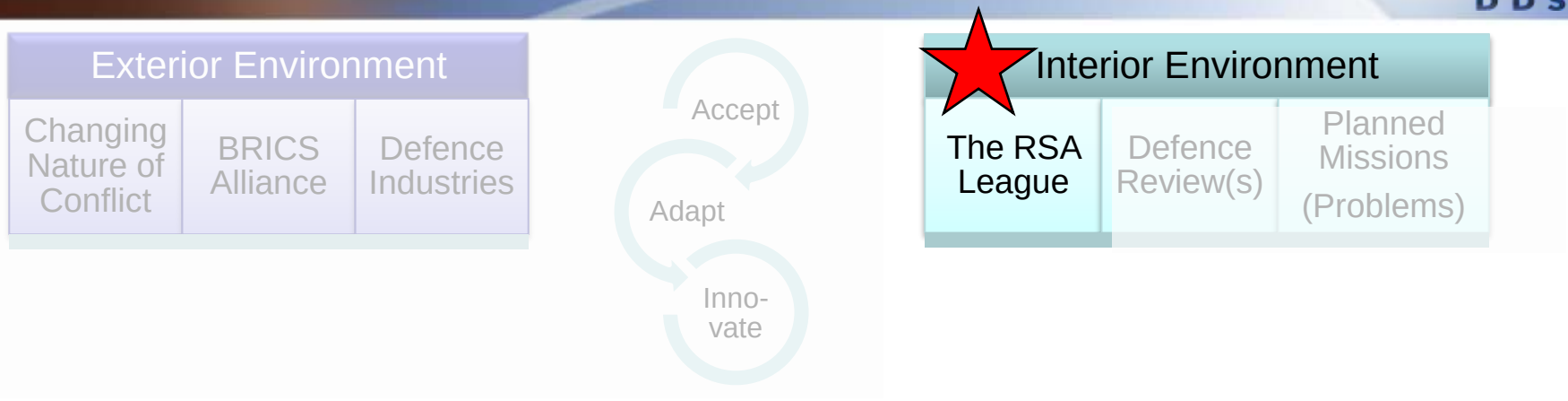


A major reduction in defence spending in the West.
A shakeout in the European/North American global defence industry giants?
A period of consolidation after Afghanistan?

The probability of technology breakthroughs based on internal R&D funds is uncertain.

Source: Bloomberg, analysis by CSIS Defense-Industrial Initiatives Group.

Deducing Technology Requirements

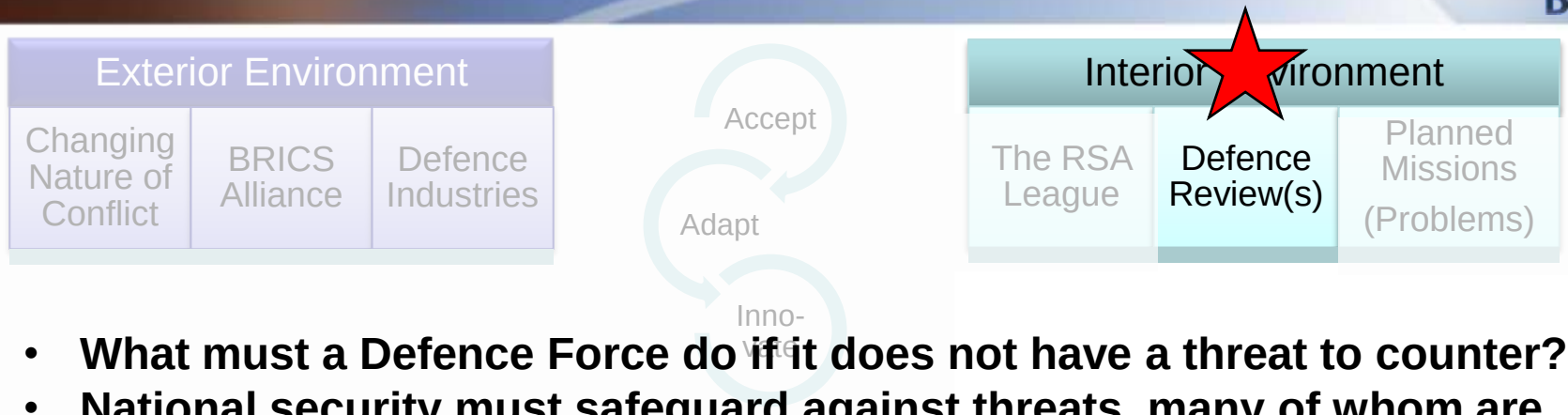


- **A middle-income, emerging economy, affluent in natural resources with well-developed legal, communications, financial, energy and transport sectors.**
- **18th largest stock exchange in the world.**
- **27th largest GDP in the world.**

BUT

- **128th in its economic growth.**
- **Unsuccessful in its education/HR development strategies, especially hard sciences.**

Deducing Technology Requirements (1)



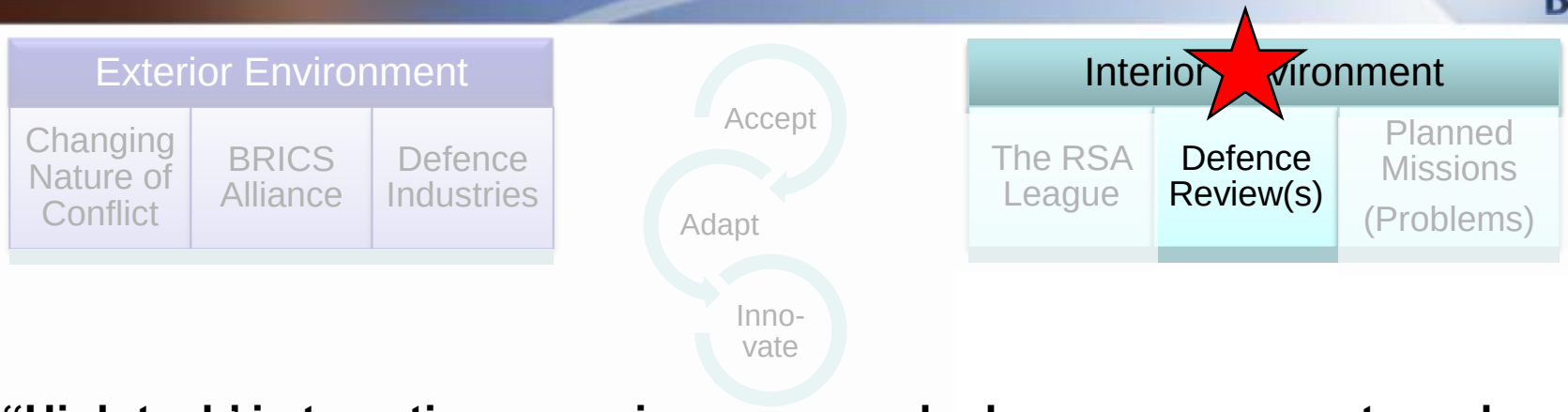
- **What must a Defence Force do if it does not have a threat to counter?**
- **National security must safeguard against threats, many of whom are non-military in nature (DDR 3/97).**

The Defence Force will be maintained as a balanced modern, flexible, technologically advanced force … appropriately equipped …spectrum of conflict. (DDR 1/32.d).

"…firstly prevent and deter armed conflict and secondly succeed against the threat should all other measures fail. (DDR 5/38).

"… the acquisition of inter-operable equipment within the region as a stepping stone to regional interoperability and a functional SADC Standby Force …". (DDR 6/91)

Deducing Technology Requirements (2)



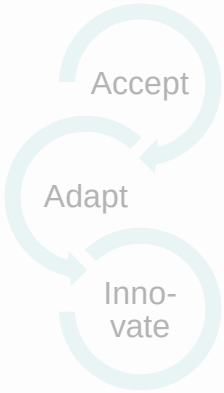
"High tech' is tempting, can give a very real edge over opponents and can be the most cost-effective option. But 'high tech' can also be costly to achieve and maintain. 'Low tech' is tempting because it is in most cases cheaper, but can prove to a false economy if the opposing forces are better equipped. The choice must be taken judiciously on a case-by-case basis". (DDR 7/101.d)

"Complex equipment that is needed in small numbers is generally optimally acquired military-off-the-shelf." (DDR 7/101.e).

"While sufficient consideration must be given to research and development, care must be taken to not over-specify requirements in a chase of technology, and as such detracting from the general principle of acquiring equipment military-off-the-shelf." (DDR7/101.f).

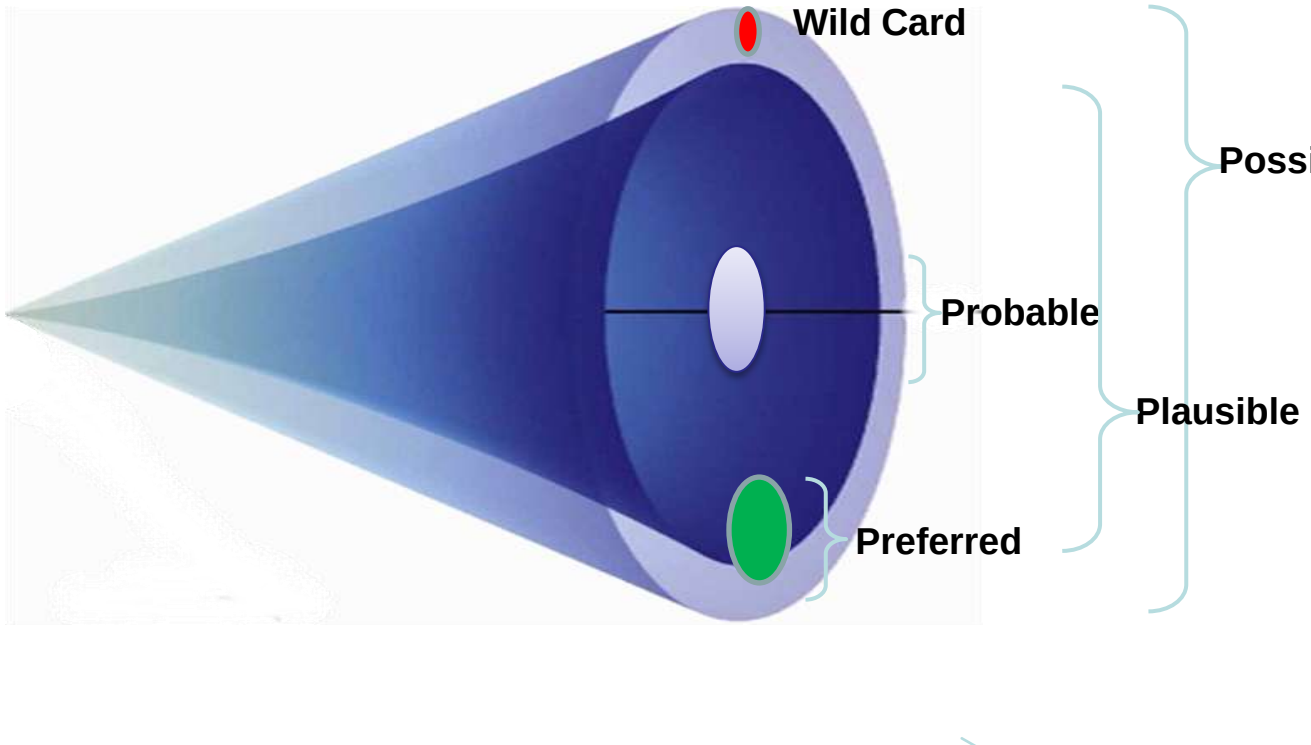
Technology and Missions

Exterior Environment		
Changing Nature of Conflict	BRICS Alliance	Defence Industries

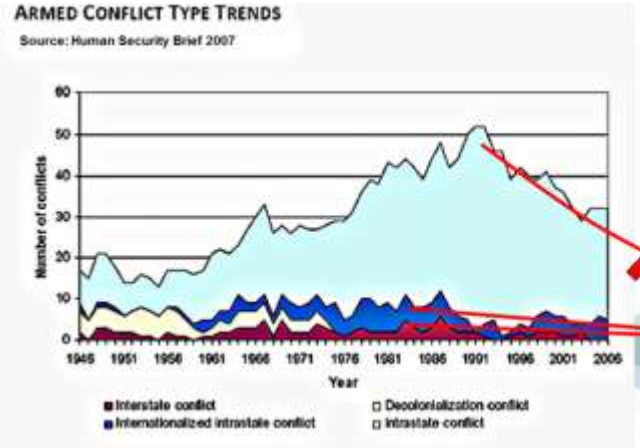


Interior Environment		
The RSA League	Defence Review(s)	Planned Missions

Not a Threat Based but a Scenario Based Approach



An Approach to a Robust Future Answer?



Asymmetry

The Trend?

Linear Force on Force Interstate Conflict

Limited Intervention

Peace Missions

Internal Stability

Border Security

Humanitarian Aid

"TROUBLED PEACE"

A force design that can:

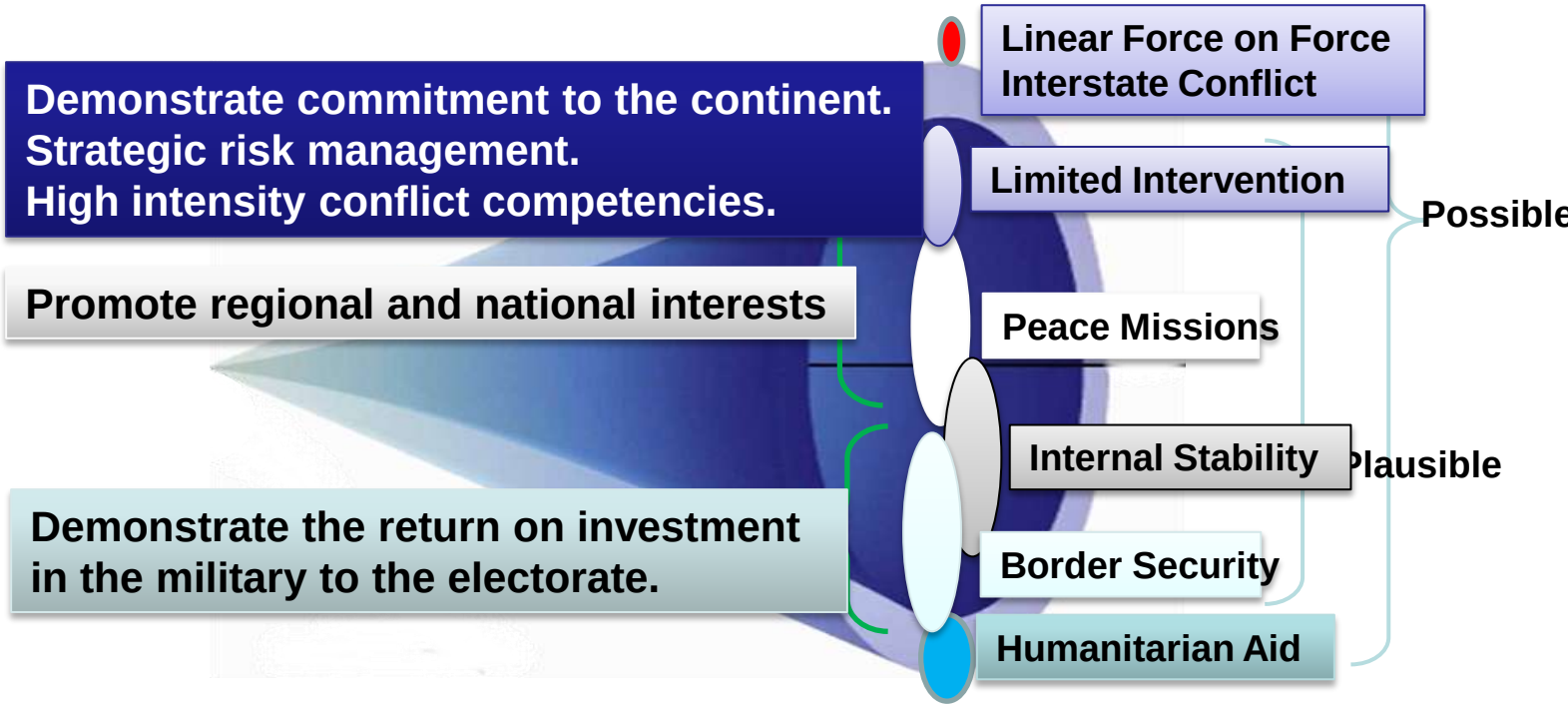
Promote national interests

History

Today

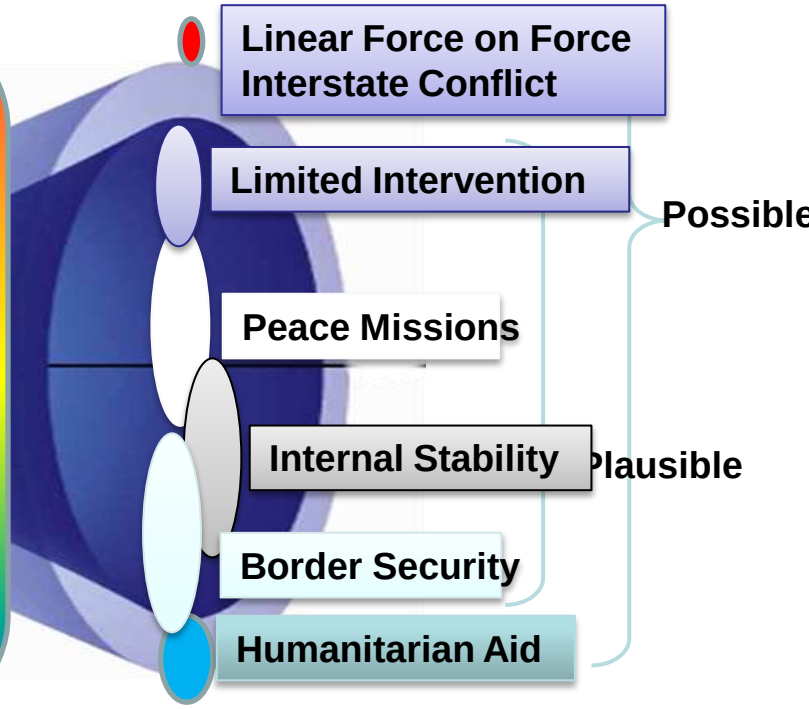
The Future

The Why of Each Mission?



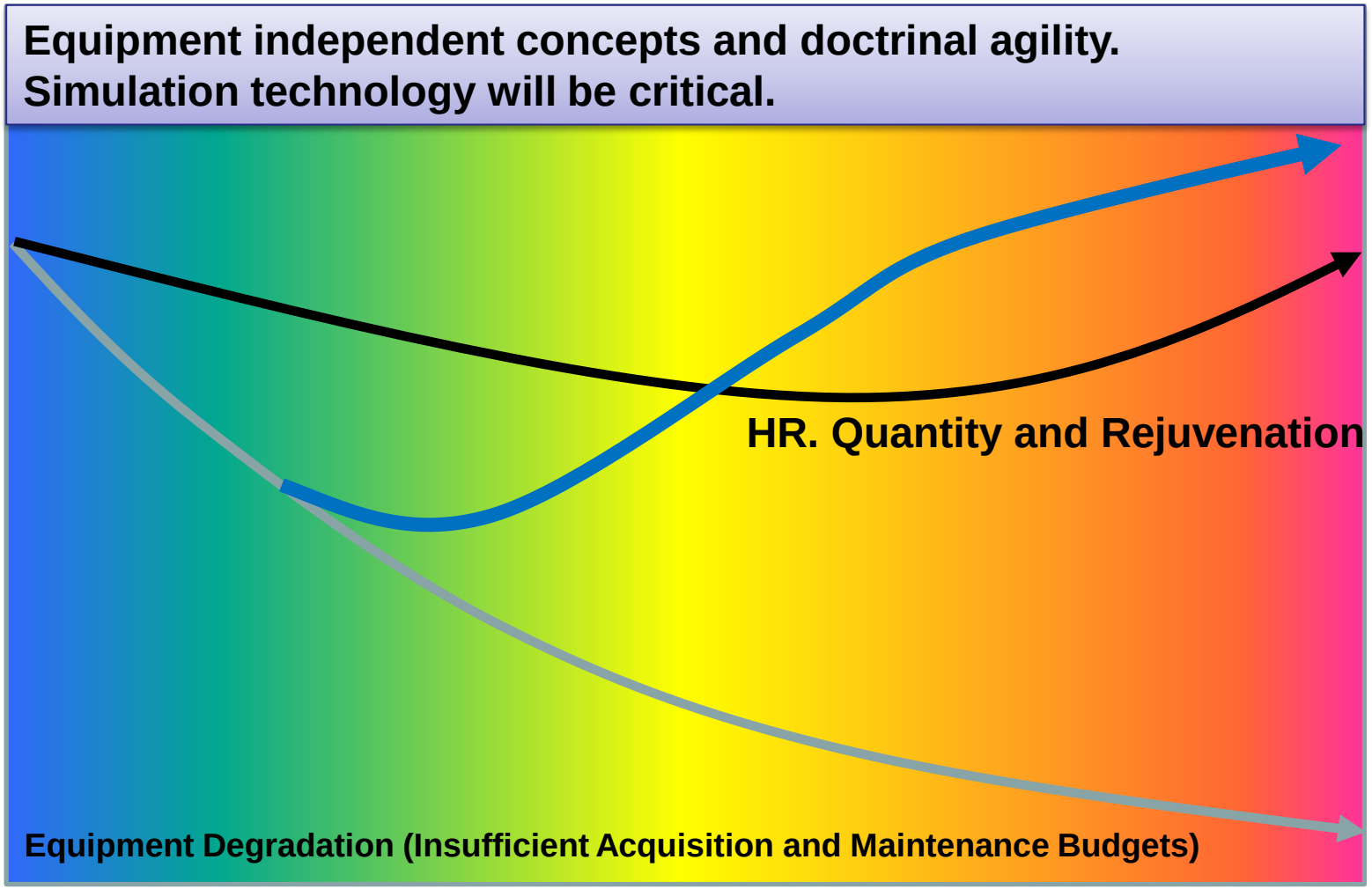
Required Technology Footprint

1. Commonality between many scenarios.
2. Identify those technologies with wide application across scenarios as well as a few force multipliers.
3. Aggregate and prioritise.
4. Filter for feasibility.



The Next Decade?

Capability Level



Time

Conquering the RSA?

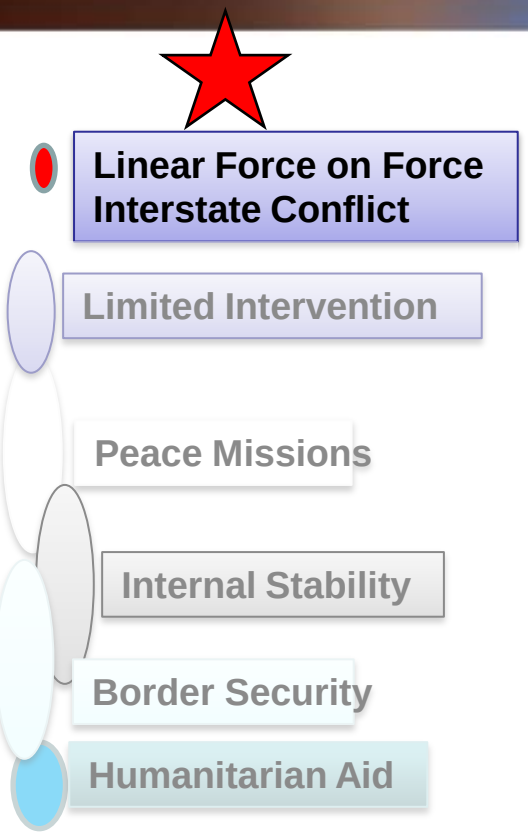
- **Strategic Level**
  - The modern opponent "…. weave their slow, purposeful way through …
  - systems of education, commerce, and travel,
  - accessing the fabric of democratic societies
  - and exploiting
    - our freedom of movement,
    - information systems,
    - protection of civil rights,
    - and the general laxness in our public security"

General Montgomery Meigs in "Unorthodox Thoughts about Asymmetric Warfare"

- **Tactical Level**
  - Terrorism
    - Internal instability driven.
    - Reaction by an African peace mission antagonist.
    - A proxy front manipulated by a major power.

One can easily focus on the wrong front.

Relevant Technologies?



"… In the absence of any foreseen or readily foreseeable military … threat against South Africa, many capabilities need not be maintained at a high level …" (DDR 6/9)
Deterrence include soft factors as well.

<u>Identify and understand, but don't acquire</u>, those few technologies that could provide a game changing advantage:

1. **Very long range and loitering munitions precision munitions with tuneable effects, eg Fire Shadow.**
2. **Own or access technologies that can increase strategic awareness, eg space based sensing.**
3. **Offensive and defensive cyber capabilities.**

The selection of technologies and the development of the concept for defence must be done iteratively.

Relevant Technologies?

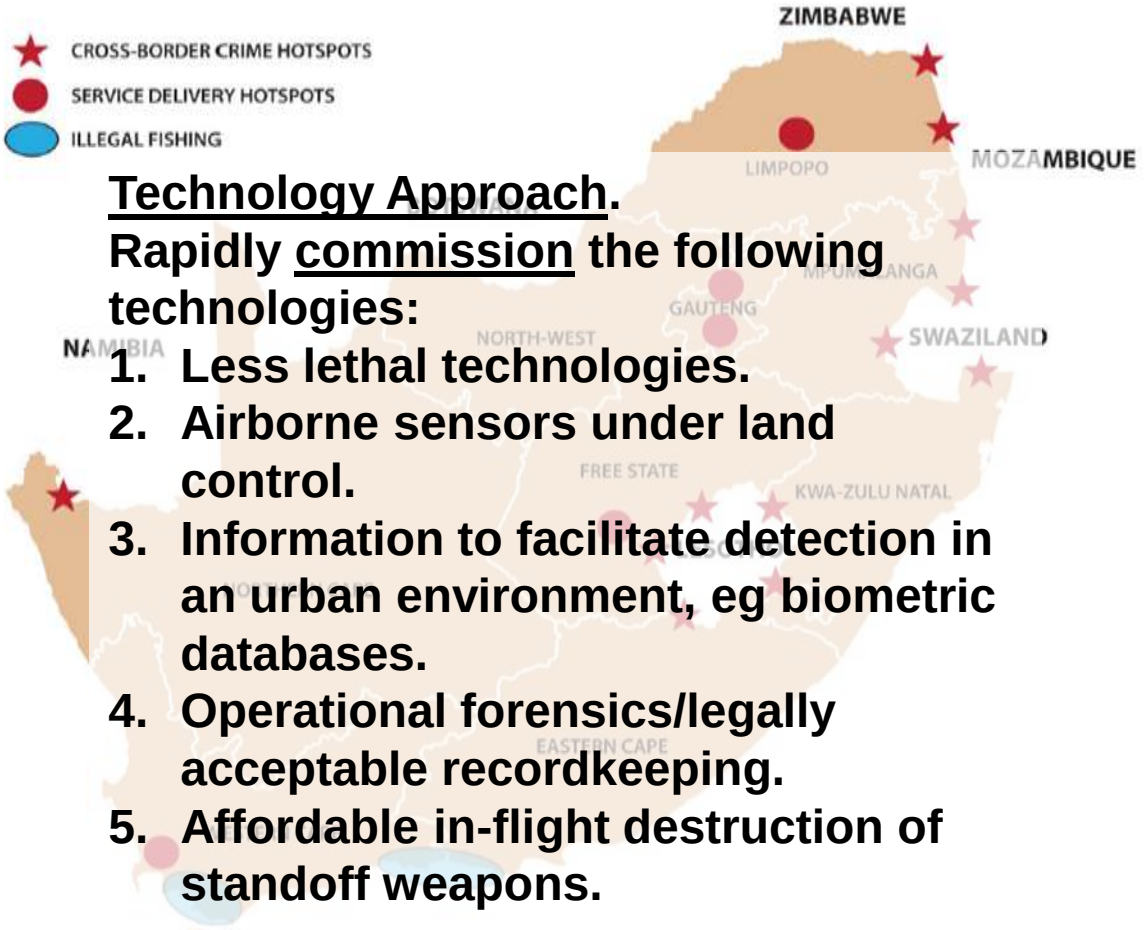
Maintain at high readiness levels, a highly mobile force that can deter and/or shape strategic events.

<u>Technology Approach: Acquire:</u>

1. **Protection technologies to enhance the limited ballistic protection, eg active protection for light vehicles.**
2. **IED detection technologies:**
    1. **Real time**
    2. **And left of boom (sniffing and battlefield forensics?).**
3. **C4IRS technologies:**
    1. **A light force has limited ability that cannot be wasted with incorrect planning.**
    2. **Force multipliers such as small UAVs and robotic sensors.**
    3. **Blue force tracking.**
4. **Sustainment technologies (sustainment robots?):**
    1. **Land based squad support systems.**
    2. **Autonomous air delivered logistics.**
5. **Protection against projection of insecurity (AMISOM).**

Relevant Technologies?

- Linear Force on Force Interstate Conflict
- Limited Intervention
- Peace Missions
- Internal Stability
- Border Security
- Humanitarian Aid



<u>Technology Approach</u>.

Rapidly <u>commission</u> the following technologies:

1. **Less lethal technologies.**
2. **Airborne sensors under land control.**
3. **Information to facilitate detection in an urban environment, eg biometric databases.**
4. **Operational forensics/legally acceptable recordkeeping.**
5. **Affordable in-flight destruction of standoff weapons.**

So What?

- **Possible Long Term Technology Positions:**
  - Collaborative – A high technology army using the BRICS alliance's technology.
  - Independent - Selected western technologies.
  - Isolated – Indigenous technology.
- **An innovative opponent think tank is required to ensure the relevance of developments.**
- **Is the SA Army concepts acknowledging the role of current and future technology?**

So What?

- **The “primitive” opponent outthinks the standing force and is digitally literate.**
- **The next generation in the SA Army is digitally literate.**
- **Affordability:**
  - Exploit COTS, eg the smartphone and tablet.
- **A technology think tank working seamlessly from System Level 8+ to System Level 1.**
- **Transform to an innovative spin-in culture.**
  - More than 100 space programs active (including non-state actors.
  - 46 Countries produce UAVs.

Summary

Aggregated and then prioritised for applicability, affordability and value.

Protection	**Active protection for light vehicles.** **Robots to reduce risks.**

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C2	**Intellectually agile leaders.** **Interoperability between forces.** **Technical level interoperability with SANDF radios.** **Algorithms between man and machine to ease operation.**

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Awareness	**Biometrics and Forensics.** **Legal standard recordkeeping.** **Robots.** **Subsurface awareness.**

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Awareness	**Biometrics and Forensics.** **Legal standard recordkeeping.** **Robots.** **Subsurface awareness.**
Sustainability	**Support robots.**

Summary

- The most valuable technology (not available off the shelf) is people that can innovate .
- This implies intellectual agility.
- The supporting technology for intellectual agility is Concept Development Experimentation and Simulation.

Questions