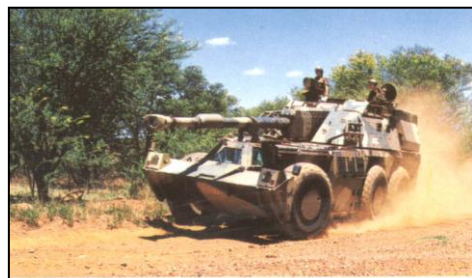




Briefing on Defence Research & Development Funding to Joint Standing Committee on Defence



Presenter: Brig Gen A.R. Barends
Director Technology Development
16 March 2023



Aim

- To brief the Joint Standing Committee on Defence on the **Funding** for Domestic Defence Research and Development (Technology Development Programmes of the Department of Defence)

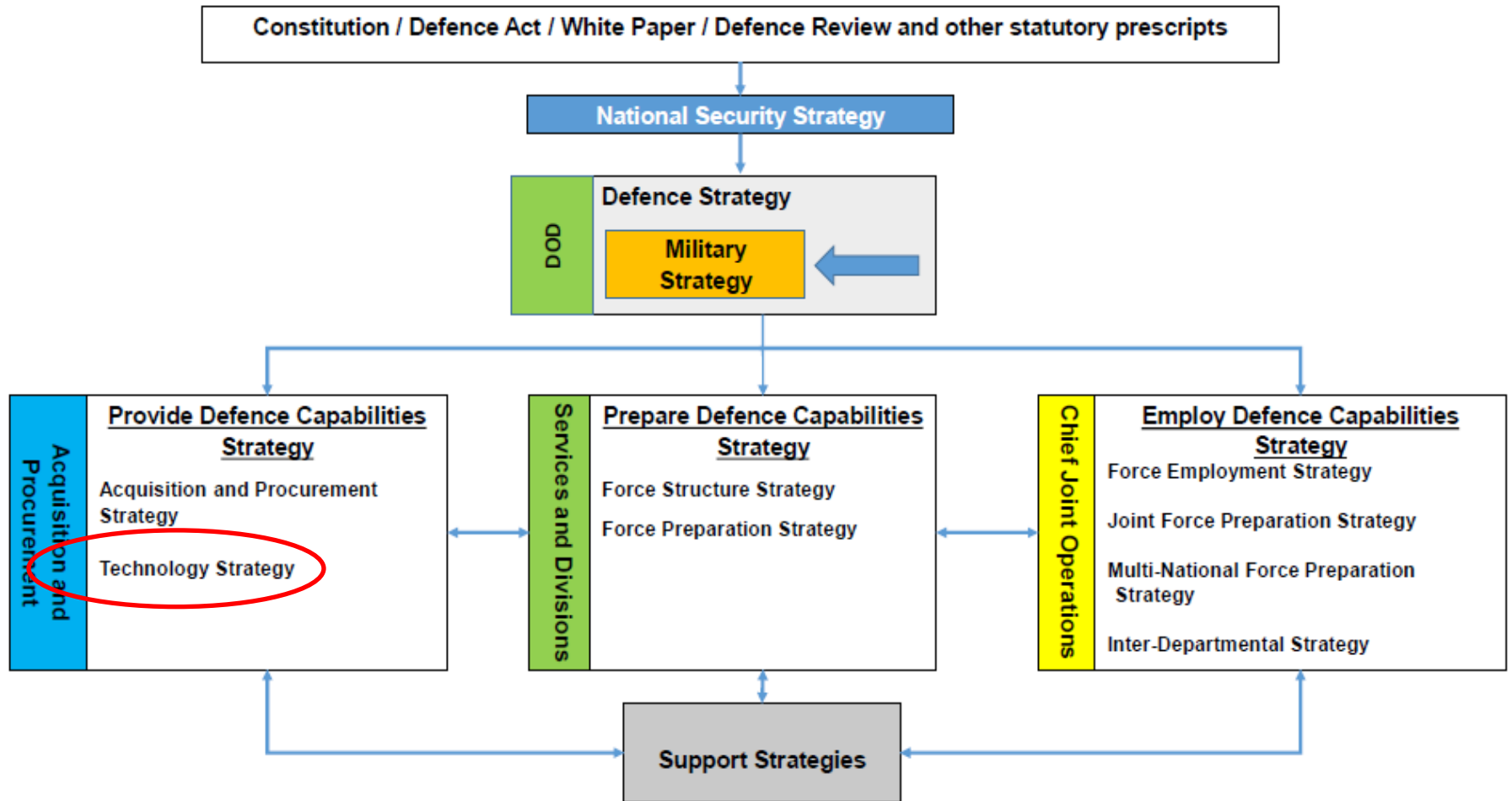


Scope

- Military Strategy Map
- Technology Development Mandate & Its Origin
- Why Defence Technology & How Technology Supports the DOD?
- Technology Domains and Facilities
- SCAMP & Technology Development Projects
- MTEF FY 2022/23 – 2024/25
- MTEF Shortfalls
- Unfunded Technology Development Requirements
- Implications on loss of capabilities
- Future Technologies
- Discussion / Questions



Military Strategy





DTD Mandate

- The mandate of the DTD is to direct and cultivate defence research and technology development in pursuit of future South African National Defence Force (SANDF) needs. This is done by establishing programmes that will facilitate a technology base sustained in areas that are of strategic and/or economic importance as emphasised in the South African Defence Review 2015
- This technology base will support the SANDF in the development of new equipment with superior performance, upgrades and life extension programmes, operational problem solving, specification, test & evaluation of sophisticated equipment as well as trend and impact analysis of technological developments
- In terms of the management process, the Defence Review propagates the establishment of Centres of Expertise as well as Research and Development as well as Test and Evaluation Facilities



White Paper on Defence

- The SANDF shall be a balanced, modern, affordable and **technologically** advanced military force, capable of executing its tasks effectively and efficiently. This means:
 - maintenance, upgrading and, where necessary, the replacement of weapons and equipment
 - an efficient defence industry is required to address the above needs to enable the SANDF to meet its constitutional obligations



Defence Review 2015

- Defence must remain abreast of developments in defence **technology** and **other potentially relevant technologies** required in developing, manufacturing and supporting complex defence systems
- A broad range of **technical and technological skills and capabilities** must be established over the long term. *A Chief Defence Scientist* will have responsibility for defining, coordinating and maintaining **diverse defence research and development requirements**, including policy analysis capacities



Defence Review 2015

- Aim of defence technology acquisition management is to identify technologies on a long-term prediction basis that will support the future needs of the SANDF
- DOD is required to promote local industry where practical and economically justifiable
 - For technical, economic, and political reasons
- Retain the appropriate capabilities at the appropriate level considering the following:
 - **Military-strategic importance.** Defence industry is a strategic asset to ensure the supply of armaments and services to the SANDF
 - **Military-operational importance:**
 - Technological advantages – gives winning edge
 - Tailor-made equipment – unique for operating environment
 - Logistic support – better guarantee for through life support



White Paper on Defence Related Industries



- **Role of Defence Technology Base**
 - Provide technical support to the DoD, enabling it to be knowledgeable purchaser and user
 - Ensure continued effectiveness of military systems
 - Develop equipment with unique capabilities by continued product improvements or upgrades
 - Provide equipment to satisfy unique requirements
 - Provide strategic independence in key strategic areas or certain niche areas



Technology Development Policy: DODI 00185

- It is DOD policy that the Department will conduct the development of technology within a single and standardised management system, regulated by the Chief of Defence Matériel
- To ensure the continued effectiveness of SANDF in military operations, the DOD implemented an appropriate policy and strategy to manage technological change(s) within its operating environment
- DODI 00185 Policy was approved: 06 July 2022



WHY DEFENCE TECHNOLOGY & HOW TECHNOLOGY SUPPORTS THE DOD?



Why Defence Technology?

- Research, development, test and evaluation in selected domains that will enable the DOD to:
 - Be a knowledgeable buyer of defence systems
 - Be a knowledgeable user of defence systems
 - Be knowledgeable managers of defence capabilities
 - Ensure independence in identified strategic technology areas
 - Contribute towards related national objectives such as industrial growth and high level skills development



How is Technology supporting the SANDF?

- Provide a ready capability base effectively operating as 'in-house' Science & Technology capabilities of the DOD supporting them through:
 - Support the end user Required Operational Capability (ROC) development and to evaluate technical specifications
 - Plan, evaluate and optimise military experimentation and doctrine
 - Measure and analyse equipment performance in field exercises
 - Develop techniques to improve and optimise effectiveness of equipment and promote interoperable use of existing equipment
 - Demonstrate and evaluate potential of new technologies, develop technology strategies and road maps



TECHNOLOGY DOMAINS

LANDWARD

AEROSPACE

MARITIME

SUPPORT
OPS

ELECTRONICS

FIREPOWER

PROTECTION

MOBILITY

SPECIAL FORCES

AERONAUTICS

GUIDED WEAPONS

AIRBORNE ELECTRONIC
WARFARE

MARITIME INDUSTRY

IMT SCIENTIFIC SUPPORT
SERVICE

HUMAN FACTORS AND
SOLDIER SUPPORT

CHEMICAL DEFENCE

EDERI RESEARCH
TECHNOLOGY BASE

STRATEGIC ELECTRONICS
CAPABILITIES IN NOMINATED
INDUSTRIES

EACH DOMAIN INCLUDES DERI AND NON-DERI TECHNOLOGY RESEARCH



LEDGER & DEFTED



➤ UNIVERSITY PROGRAMMES

- DESUP - DEFENCE ENGINEERING AND SCIENCE AND TECHNOLOGY PROGRAMME
- DEFTED - DEFENCE TECHNOLOGY ENTERPRISE DEVELOPMENT



TECHNOLOGY DERI's (& Test Ranges)

LANDWARD

AEROSPACE

MARITIME

SUPPORT OPS

ELECTRONICS

LANDWARD DERI
CSIR

DETONICS BLAST AND
EXPLOSIVES LABORATORY
(DBEL)
CSIR

SPECIAL FORCES DERI
CSIR

AEROSPACE DERI
CSIR

OVERBERG TEST RANGE
DENEL

MARITIME DERI
(IMT)
ARMSCOR

HUMAN FACTOR DERI
(ERGOTECH)
ARMSCOR

CHEMICAL AND BIOLOGICAL
DEFENCE DERI
(PROTECHNIK)
ARMSCOR

ELECTRONICS DERI
(PROJECT INDICATE-CHEVRON³)
CSIR



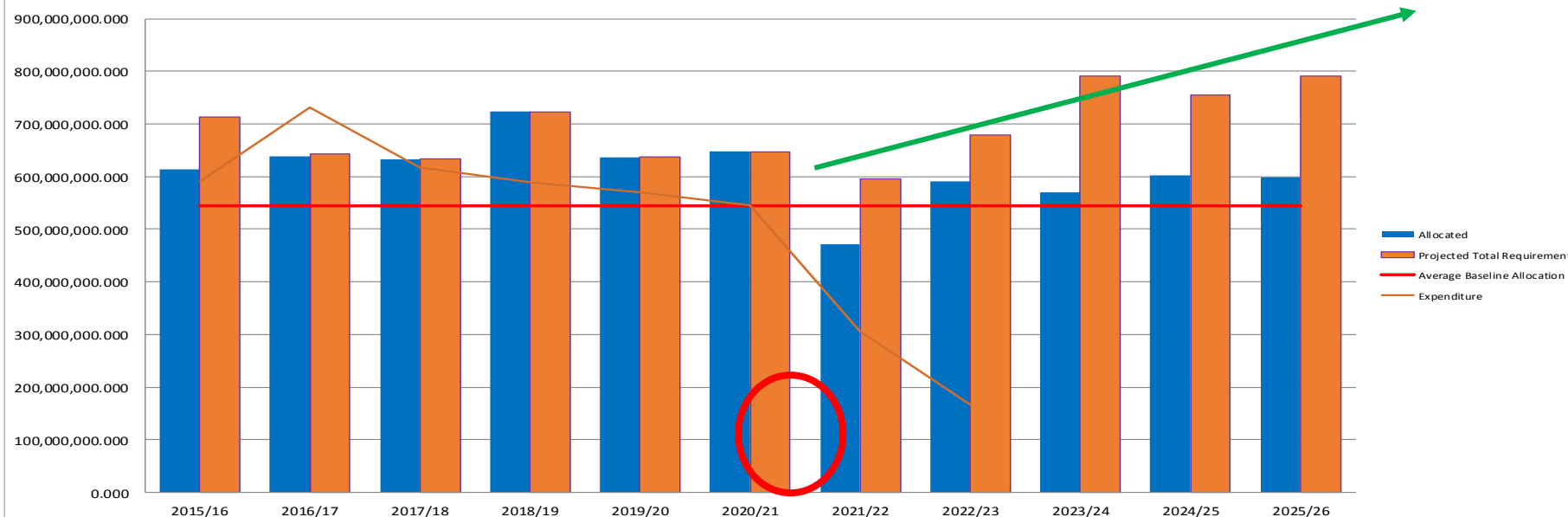
SCAMP Allocations & Expenditure



DTD SCAMP ALLOCATIONS: FY 2015/16 TO FY 2025/26

DTD ALLOCATIONS	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
TECHNOLOGY											
Initial Change Strat	527,630,064	527,124,942	521,190,383	525,500,000	590,000,000	619,500,000	0	590,110,500	569,951,643	601,531,075	598,266,867
Percentage Increase	0.00%	-0.10%	-1.13%	0.83%	12.27%	5.00%	-100.00%	100.00%	-3.42%	5.54%	-0.54%
Average Increase %	1.68%	1.85%	2.06%	2.46%	2.69%	1.10%	0.32%	25.40%	0.53%	2.50%	-0.54%
Average Baseline Allocation	544,770,661	544,770,661	544,770,661	544,770,661	544,770,661	544,770,661	544,770,661	544,770,661	544,770,661	544,770,661	544,770,661
Projected Total Requirement	713,480,064	642,624,942	632,690,600	723,720,646	637,143,452	647,340,250	596,238,000	679,707,263	791,388,000	755,579,000	790,937,000
Allocated	613,630,640	638,124,942	632,690,600	723,720,646	637,143,452	647,340,250	472,256,823	590,110,500	569,951,643	601,531,075	598,266,867
Expenditure	590,180,909	731,373,348	618,088,912	588,419,244	570,784,868	544,955,902	306,726,337	166,820,678			
Expenditure %	72.85%	80.25	75.28%	63.25%	58.78%	56.22%	62.85%	22.13%			
Shortfall	-99,849,424	-4,500,000	0	0	0	0	-123,981,177	-89,596,763	-221,436,357	-154,047,925	-192,670,133
% Funded	86.00529587	99.29974707	100	100	100	100	79.2060927	86.81833079	72.01924252	79.61193667	75.64026806

DTD SCAMP ALLOCATIONS FY 2015/16 - FY 2025/26

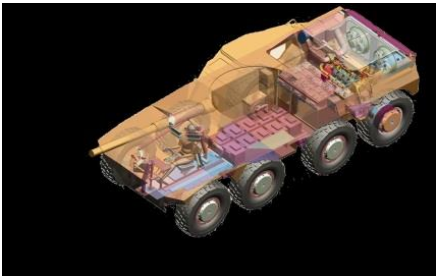




“Investing in Defence Technology is securing our Future, Security and Safety”



Technology Programmes ...1

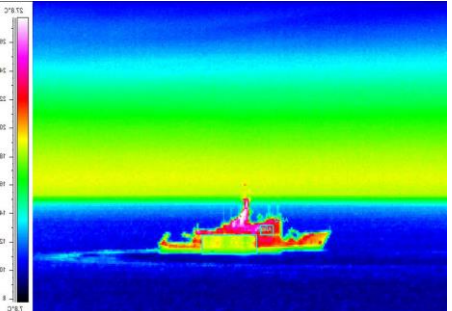




Program	Short Description	MTEF(RM)
 <p>LANDWARD TECHNOLOGY (SA ARMY)</p> <ul style="list-style-type: none"> - TANGENT - TEMPLATE - KONYA 	<p>Firepower (Propellants, Guidance, Fuses, Terminal Effects)</p> <p>Mobility (Electric Drive)</p> <p>Protection (Armour: Passive, Active)</p>	<p>23/24: 76,750 24/25: 76,427 25/26: 85,527</p> <p>T 238,704</p>
 <p>SPECIAL FORCES OPERATIONS TECHNOLOGY</p> <ul style="list-style-type: none"> - UBUNTU 	<p>Sensing (Night Ops)</p> <p>Explosives (Chemical & Blast Effect)</p> <p>Mobility (Escape and Evasion)</p> <p>Communication (Detection and Counters)</p>	<p>23/24: 34,800 24/25: 35,496 25/26: 35,496</p> <p>T 105,792</p>
 <p>AEROSPACE TECHNOLOGY (SAAF)</p> <ul style="list-style-type: none"> - VENTURE - PROJECTION - LOBBY 	<p>Air Frames (Fly by wire)</p> <p>Air Weapons</p> <p>Sensors (COMINT, ELINT and JAMMERS)</p> <p>Hostile Firing Indicator</p>	<p>23/24: 78,452 24/25: 93,923 25/26: 100,231</p> <p>T 272,606</p>



Technology Programs ...2


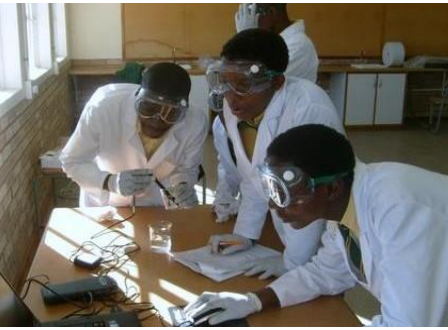


Project	Short Description	MTEF(RM)
 <p>MARITIME TECHNOLOGY (SA NAVY) - FLAGG - PROSPECTIVE</p>	<p>Above and Below Water Detection (Maritime Radar, Electro-optics and Sonar) Self Protection (Ship Signature, Mine warfare and Decoys) Environmental Characterization (Understanding Maritime Environment)</p>	<p>23/24: 75,299 24/25: 78,714 25/26: 79,454</p> <p>T 233,467</p>
 <p>SUPPORT OPERATIONS TECHNOLOGY (SAMHS)</p>	<p>Chemical Biological Protection (Decontamination) Ergonomics (Anthropometry) Medical Health (HIFU)</p>	<p>23/24: 48,000 24/25: 50,750 25/26: 56,674</p> <p>T 154,424</p>
 <p>ELECTRONICS TECHNOLOGY - INDICATE</p>	<p>Radar and Optronics Research Command & Control (Data Fusion) - Information Warfare Cryptography Telecommunications</p>	<p>23/24: 154,824 24/25: 154,212 25/26: 156,992</p> <p>T 466,028</p>



Technology Programmes ...3



Project	Short Description	MTEF(RM)
 <p>TEST & EVALUATION - DUCE</p>	<p>Overberg Test Range (OTR) for All Services Low Cost Target Drone</p>	<p>23/24: 101 826 24/25: 112 009 25/26: 83,892</p> <p>T 297,727</p>
 <p>DEFENCE ENGINEERING AND SCIENCE UNIVERSITY PROGRAMME</p>	<p>Post Graduate Research (MSc / PhD) Support to school in Science & Mathematics Artisans & Vacation Work</p>	<p>0</p>
<p>SMME's</p>	<p>DEFENCE TRANSFORMATIVE ENTERPRISE DEVELOPMENT</p>	<p>Empowerment of Previously Disadvantaged Individuals in the maintenance and development for defence technology related activities</p> <p>0</p> <p>* Payment per Transfer Payment</p>



MTEF ALLOCATION SUMMARY



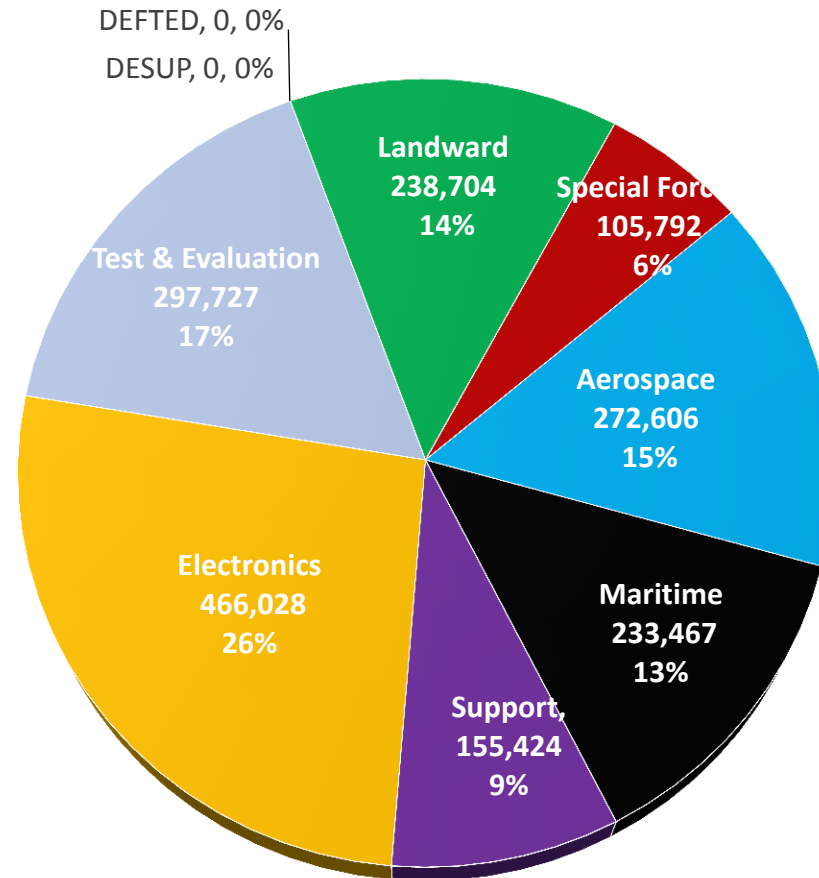
DEFENCE TECHNOLOGY DEVELOPMENT PROGRAMME PLAN BUDGET ALLOCATION

S/No	Technology Programmes	FY 23/24 (R'000)	FY 24/25 (R'000)	FY 25/26 (R'000)	Portfolio Total (R'000)
	a	b	c	d	e
1	Landward Technology	76,750	76,427	85,527	238,704
2	Special Forces Operations Technology	34,800	35,496	35,496	105,792
3	Aerospace Technology	78,452	93,923	100,231	272,606
4	Maritime Technology	75,299	78,714	79,454	233,467
5	Support Operations Technology	48,000	50,750	56,674	155,424
6	Electronics Technology	154,824	154,212	156,992	466,028
7	Test & Evaluation	101,826	112,009	83,892	297,727
8	University Programme (LEDGER-DESUP) & DEFTED	0	0	0	0
9	MTEF Total	569,951	601,531	598,266	1 769 748

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MTEF Allocation





FY 23/24 Shortfall

TABLE 3: DEFENCE TECHNOLOGY DEVELOPMENT PROGRAMME PLAN BUDGET ALLOCATION & SHORTFALL

S/No	Technology	FY2023/24 (R'000)			FY2024/25 (R'000)			FY2025/26 (R'000)		
		Planned	Allocated	Shortfall/ Surplus	Planned	Allocated	Shortfall/ Surplus	Planned	Allocated	Shortfall/ Surplus
	a	f	g	h	i	j	k			
1	Landward	129,160	76,750	52,410	121,518	76,427	45,091	128,485	85,527	42,958
2	Special Forces	34,800	34,800	0	35,496	35,496	0	35,496	35,496	0
3	Aerospace	202,837	78,451	124,385	191,828	93,923	97,905	202,828	100,231	102,597
4	Maritime	77,821	75,299	2,522	78,714	78,714	0	77,296	79,454	+2,158
5	Support	67,910	48 000	19,910	63,065	50 750	12,315	66,681	56,674	10,007
6	Electronics	170,147	154,824	15,323	161,793	154,212	7,581	171,070	156,992	14,078
7	Test & Evaluation	108,712	101,826	6,886	103,165	112,009	+8,844	109,081	83,892	25,189
8	Total	791,388	569,951	221,436	755,579	601,531	154,048	790,937	598,266	192,670

“Investing in Defence Technology is securing our Future, Security and Safety”



UNFUNDED PROJECT COSTING



TABLE 4: UNFUNDED TECHNOLOGY DEVELOPMENT REQUIREMENTS & ASSOCIATED RISKS

Serial	Technology Programme / Project	FY 2023/24	FY 2024/25	FY 2025/26	Comments/Risks
		(R'000)	(R'000)	(R'000)	
	a	b	c	d	e
1	Maritime Airborne Anti-Submarine Warfare System	30,000	30,000	30,000	Off-the-shelf system is available, unless if RSA has to establish sovereign capability then the research has to be established. Currently no means of detecting undeclared dived submarines in the Maritime environment. Awaiting strategic guidance in order to start this activity.
2	Multi-spectral Main Sight System	10,000	8,000	8,000	Combination of thermal channel and digital day camera that enables the soldiers to use the sight for both day and night operation, eliminating the need to change sights/devices between day and night does not currently exist. Awaiting strategic guidance in order to start this activity.
3	20mm Gun Capability (Drum Canon)	10 000	50,000	30,000	Indigenized capability does not exist. Current 20mm is a foreign weapon with no more alterations permissible, no support for current systems.
4	SF Underwater explosive capability	4,000	4,000	4,000	Technology required for autonomous placement of underwater ordnance does not exist for RSA SF. This requirement is an operational necessity.



UNFUNDED PROJECT COSTING



TABLE 4: UNFUNDED TECHNOLOGY DEVELOPMENT REQUIREMENTS & ASSOCIATED RISKS

Serial	Technology Programme / Project	FY 2023/24 (R'000)	FY 2024/25 (R'000)	FY 2025/26 (R'000)	Comments/Risks
	a	b	c	d	e
5	Joint Strike Missile	1,000,000 (bn)	1,000,000 (bn)	1,000,000 (bn)	Requirement exists from MTSC. Surface to surface missile nearing end of life cycle, will lead to no offensive surface to surface capability on the Frigates. Awaiting strategic guidance in order to start this activity.
6	76mm Rooikat Turret: Maritime Requirement	2,000	25,000	55,000	This will enhance the naval platforms to exert Firepower (Naval Gun Fire Support when and where required during operations and exercises). Should the future requirements to enhance the Naval Gun Fire Support for protection and support to own forces not be considered it may lead to no offensive surface to surface, or surface to air capability to reach and firepower for Maritime Operations.
7	30mm DEFA/ CAM Gun: Maritime Requirement	10 000	35 000	15 000	Awaiting strategic guidance in order to start this activity.
8	Rooivalk (Upgrade / Mk II)	10 000	75 000	55 000	Acquisition SCAMP makes provision for midlife upgrade at DAFA. Technology support to the acquisition program (RONDAWEL) should be guided by the service (SAAF). Awaiting requirement confirmation.
9	Green Energy/Bio Technology	15 000	35 000	25 000	Is this military efficiency? Who will it support? Was there a requirement stated by a service? Awaiting requirement confirmation.



UNFUNDED PROJECT COSTING



TABLE 4: UNFUNDED TECHNOLOGY DEVELOPMENT REQUIREMENTS & ASSOCIATED RISKS

Serial	Technology Programme / Project	FY 2023/24	FY 2024/25	FY 2025/26	Comments/Risks
		(R'000)	(R'000)	(R'000)	
	a	b	c	d	e
10	Space Command (Satellite Payload: J C&CS)	25 000	45 000	80 000	Define what is the exact requirement to support space command into development? Awaiting requirement confirmation.
11	Cyber Security (Establish DERI)	80 000	85 000	87 000	Arm Scor R&D submitted MOA. No end user was identified. Arm Scor R&D in discussions with DMD & CMIS/ DI. . Awaiting strategic guidance in order to start this activity
12	UAV / UAS / Drone (Weaponised)	5 000	25 000	10 000	Not new technology. Off-the-shelf available. Some work done at LDERI and SFDERI as per Army requirement to establish building blocks for strategic capability. Also applicable to Maritime and Electronics. Stated in Defence Review 2015.
13	Information Communication (Secure Comms)	8 000	15 000	10 000	Not new technology. RADIATE acquisition program is addressing secure comms. Nanotech involved on acquisition at DCWA and technology already under Electronics. Awaiting new requirement confirmation.



UNFUNDED PROJECT COSTING



TABLE 4: UNFUNDED TECHNOLOGY DEVELOPMENT REQUIREMENTS & ASSOCIATED RISKS					
Serial	Technology Programme / Project	FY 2023/24	FY 2024/25	FY 2025/26	Comments/Risks
		(R'000)	(R'000)	(R'000)	
	a	b	c	d	e
14	Nano Technology	5 000	5 000	5 000	R0research in new materiel such as Graphene (more elastic than rubber and stranger than aluminium). Possible use for protection of personnel and PME. Awaiting new requirement confirmation.
15	DBEL	8,000	8,000	8,000	Test and evaluation facility required by Landward Sciences.
16	VINTEN POD	20,000	40,000	40,000	Requirement from SAAF (Combat). PD in process
17	LEDGER (DESUP)	50,000	50,000	50,000	DRDB 03/2022 - 03 March 2023 DRDB requested DTD to resume with Science, Engineering and Technology Research and Capacity Development Initiative
18	DEFTED	5 000	10 000	15 000	DRDB 03/2022 - 03 March 2023 DRDB requested DTD to resume with Defence Enterprise
TOTAL UNFUNDED REQUIREMENTS		Rb 1 297 000	Rb 1 545 000	Rb 1 527 000	APPROVAL & FUNDING REQUIRED



Landward Highlights



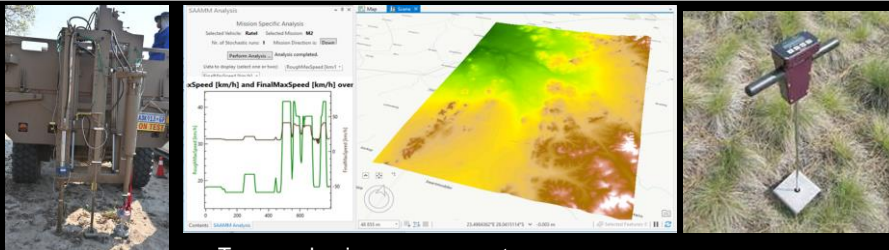
Technology Highlight

Description



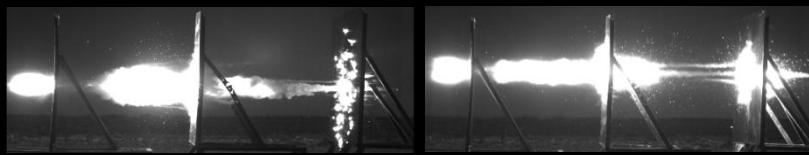
1/7th Scale (19gr PE4) / 1/2 Scale 1 kg TNT / 4/5th Scale 4 k=g TNT / Full Scale 8 kg TNT

Force-Time based Under Belly Blast IED Quantification to robustly verify and validate buried blast scaling. With SIIMA, a unique capability in the world. Can predict within 5% the blast load of a 8 kg TNT threat based on a 19 gram PE4 scaled test. Provides rich temporal data to accurately verify and validate blast and structural response computational models

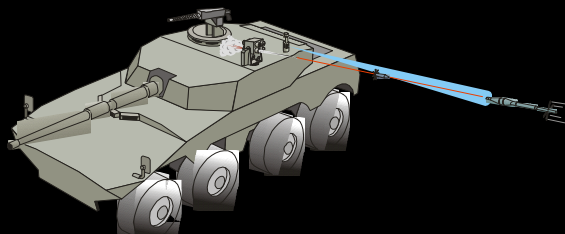


Terramechanics measurements

Updating MOBSIM (Military Vehicle Mobility Design and Performance Modelling software suite including South African Army Mobility Model Tactical Mobility mapping software in line with current best practice New Generation NATO Reference Mobility Model (NG-NRMM)



Terminal Effects: Increased warhead effectiveness against various targets (CRAM)

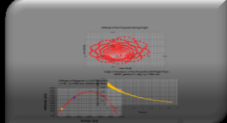
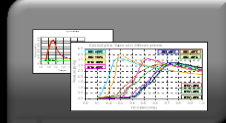
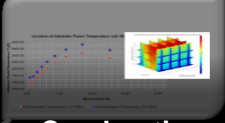
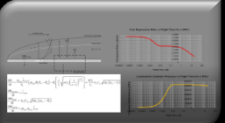
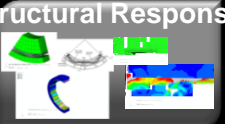
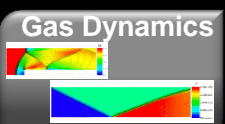




Active Armour Protection against various threats



Landward Highlights (2)



Technology Highlight	Description
<p>External Ballistics</p>  <p>Internal Ballistics</p>  <p>Thermochemistry</p>  <p>Combustion</p>  <p>Structural Response</p>  <p>Gas Dynamics</p>  <p>System Model</p> 	<p>Projects have successfully implemented the high deformation rate material properties for the Gilding Metal used for the driving band of the 155 mm ERFB projectile, obtained via Split Hopkinson Bar testing at the CSIR into Flamengro's simulations. Projects have established a new reference simulation of the ramming process, of which the rammed position will be used for a following internal ballistic simulation. Projectile delivery attitude at barrel exit will be used to compare variations in ramming velocity, barrel wear and projectile centralisation during ramming.</p>
	<p>Signature Management: Visual image of Blankets from year 1 field test (left) versus year 2 field test (middle) versus year 3 field test (right) for equivalent to ARGOS II at 5km with pixel matching (Lightweight Radar Absorbing Blanket)</p>



Aerospace Highlights



Technology Highlight

Description



Communication jammer able to intercept, direction find and jam digital radios over a wide spectrum of hopping frequencies. System is containerised and consist of a simulator which can simulate up to six digital radios, measure jamming effectiveness and the 1kw jammer. Prototype will be delivered to SAAF with training manuals and could be used by the SAAF at EW camps and force prep ex



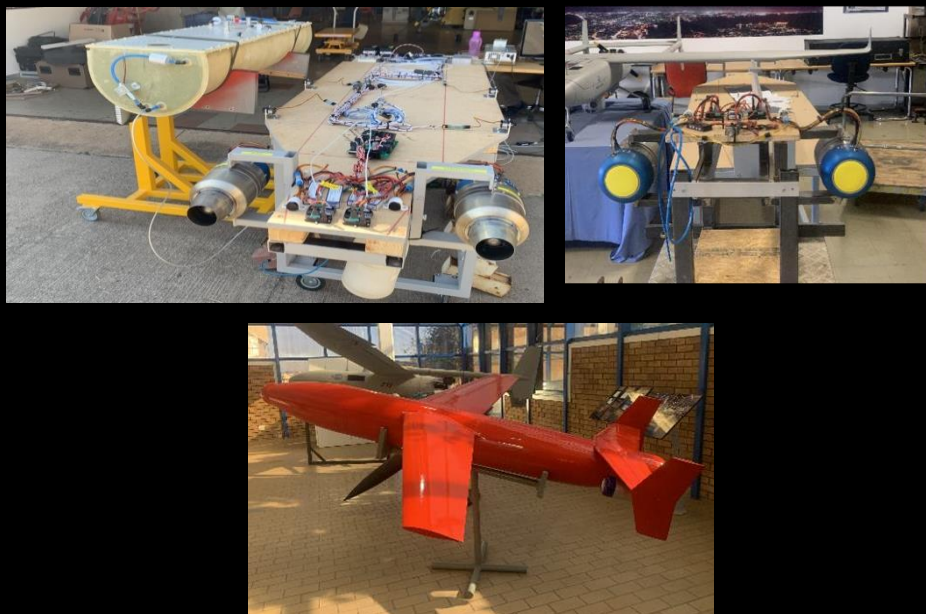
Technology, demonstrating a escort jamming capability from a fast jet. Pod has a full ELINT capability and X- band jamming capability in order to protect assets in an escort role. Prototype up to TR level 6 will be delivered to the SAAF to be utilised during EW camps and force prep ex



Aerospace Highlights (2)

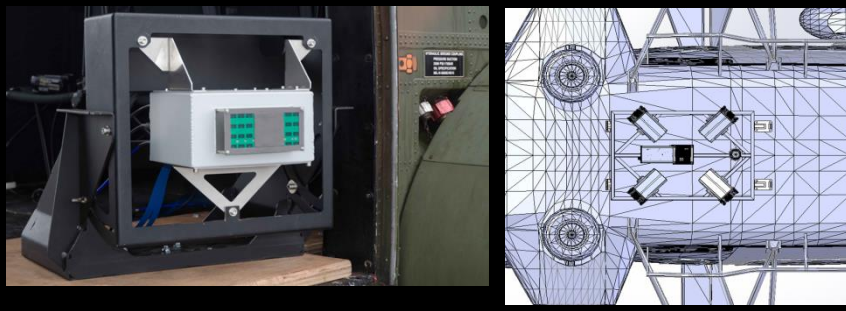


Technology Highlight



Description

DoD has no target drones left to qualify missiles and provide targets for Force Prep exercises. Project aim is to develop a TR level 6 demonstrator for the DoD to evaluate. Project started due to SKUA DRONES becoming obsolete. All three services provided inputs towards a URS and contributed financially towards a prototype. Progress was slow mainly due to COVID-19 and the situation at Denel Dynamics. Progress is at better tempo currently



Project aims to demonstrate a RF based hostile fire indicator warning aircrew against small arms fire. This demonstrator will be developed up to TR level 6 and demonstrated to the SAAF fitted onto LUH, Oryx and Rooivalk helicopter



Aerospace Highlights (3)



Technology Highlight

Description

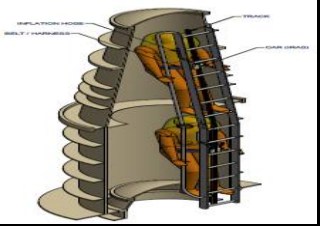
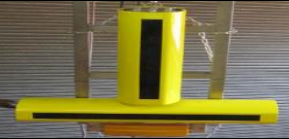


Denel Overberg Test Range (DOTR) providing the DOD with capability to do test and evaluation on technology development and operational aspects



Maritime Highlights



Technology Highlights	Description
	The DRDB funds IMT for the development of a Scientific, Engineering and Technological (SET) support capability to be utilised by the SA Navy
	Tower Escape Safety System
	30 MM MOUNTING FOR RCWS (DEFA / CAM GUN)
	Sonar Technology: state-of-the-art Technology that can be used in Sonar applications

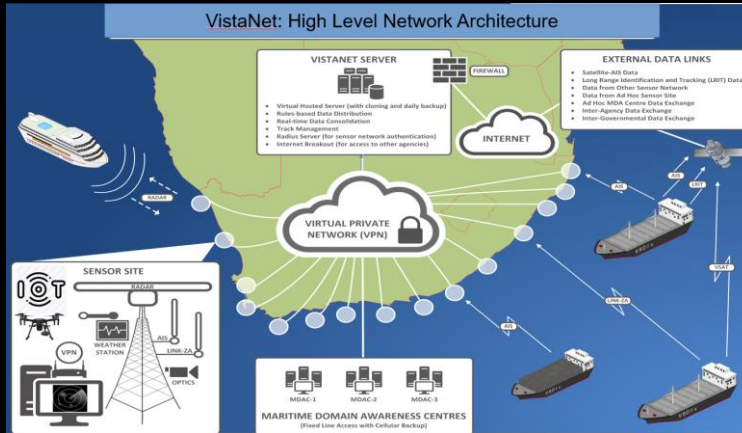


Maritime Highlights



Technology Highlight

Description



Maritime Domain Awareness
Technology Evaluation



Electro-Optic/ Infrared Test and
Evaluation Facility



Support Operations Highlights



Technology Highlight

Description

Ergonomic Research and Development in the fields of anthropometry, biomechanics, physiology, human functional performance, cognitive ergonomics , design and specifications and Test and evaluation as part of the Ergonomics DERI



The Bod Pod is a safe, non-invasive and accurate technique for the measuring of body composition. It is regard as the gold standard and will be used for scientific research conducted by the project aimed at better aligning body composition to occupational tasks.



Integration between the Xsens Awinda Motion Capture System and virtual reality. The system allows for biomechanical data (three dimensional motion data) to be collected in the field; as well as in magnetic (such as military vehicles) and virtually simulated environments



Support Operations Highlights (2)



Technology Highlight

Description

Research and Development project work in the following scientific discipline; Detection and Warning; Decontamination; Analytical and Verification; Protection and Biomedical Studies.



Capability to produce a Hydrogen Cyanide colorimetric detector, Capability to test the sensitivity of chemical vapour detectors; Capability to produce graphene based nanoparticle material required for the development of EC sensor; Developed requirements and specification as well as identification of the UAV and chemical sensor that meet Protechnik requirements for the integrated detection system, possible future collaboration with an international institution with experience in this field



Update of databases of newly synthesized compounds, accreditation received



Handled high volumes of mask testing due to Covid-19; Developed and implemented the blood splatter test for mask testing; Due to testing capabilities and good quality of work, DTIC approached Protechnik to expand the protective gear testing capability

Defence Matériel Division

Directorate Technology Development



Electronics Highlights



Technology Highlight

Description



Radar Research

- Communications and Radar EW
- RF Weapon Exploitation and Countermeasure Development
- Modelling and Simulation

This work is focussed on developing a radar knowledge capability



RF EW Research

- Involve in SAAF EW camps by providing sensing, data recording and analytical support
- Training to SANDF and Industry in Optronic Countermeasures
- Support the EW centre in the development of doctrine (simulation and T&E capabilities)
- Research into new novel countermeasures against future imaging based weapon systems
- Focus Areas. Surveillance and Platform Protection (SAAF)



IMPLICATIONS FOR CAPABILITY LOSS OF STRATEGIC RESEARCH CAPABILITIES (DERIS AND TEST RANGES)



Generic Impact



- Majority of funding for DERI activities are provided through the SDA funds. If DERI funding is threatened, pressure will be experienced on other funding sources and in all likelihood DERIs will not survive
- DERIs would not be able to execute the required functions and the Department will no longer have a ready technology knowledge base
- Loss of experienced Scientist and Engineers at DERIs, due to funding shortfalls, will be difficult to replace should funding be received later. This will have a direct impact on the South African Defence Industry
- The gap created through the loss of expertise will be extremely difficult to recover over the medium to long term and the technological competitive advantage created over years of investment will be lost
- Achieving the same or similar levels of expertise in the future will necessarily have huge cost and time implications
- Denel is a typical example of loss of expertise, knowledge and skill



Generic Impact...



- Collapse in research in research domains. No longer platform protection or electronic warfare support and advice to the DoD. Loss of capability will also impact the CSIR and result in skills and knowledge shortage in specialised environments
- Loss to the Defence Industry (Strategic Partners) in areas of Radar (development), Information System Security, Communication, Joint Command and Control and Communication Intelligence/Communication Jamming. If these research activities do not continue, the result on these Industries responsible for this, will be devastating. The country will loose the capabilities that will be difficult if not impossible to re-establish. Secure military communication and surveillance will be threatened
- Furthermore CSIR could decide to close down the Aeronautical institute which will have a critical impact on the Aerospace store integration, carriage release and modelling & simulation for the Air Force. Flight test capability will be lost and difficult to recover
- The SANDF will lose its Telemetry & Tracking capabilities at Denel Overberg Test Range and South Africa will lose International revenue. Cost to conduct Test and Evaluation on platforms could become very expensive



FUTURE TECHNOLOGIES



- Space Technologies and Robotics
- Green Energy should be a point of consideration when applying Aerospace Technology
- Cyber Security Defensive and Offensive capabilities (ARMSCOR Information/Cyber DERI)
- High Speed Computer systems to manage big data (data analytics for situational awareness and decision making)
- Virtual Reality (Maintenance and Repair) modelling and simulation
- The 2021/22 Annual Performance Plan requires DOD to constantly revise training and education requirements to be aligned with the 4th Industrial Revolution technology of the armed forces



Discussions & Inputs

“Investing in Defence Technology is securing our Future, Security & Safety”