STRIKE PUBLICATIONS

Defence today

$7.95

Volume 9 Number 2 - September 2011

Tigers
at war in Libya

Long summer of war in Libya

Post Afghanistan
where next for land warfare

Print Post PP424022/00254

ISSN 14470446

92

9 771447 044001

Lessons from Somalia

Interview: Defence Chief General David Hurley

DEFENCETODAY

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DefenceTODAY . vol 9 no 2 . september 2011
published by Strike Publications Pty Ltd
PO Box 27 Amberley 4306 Queensland Australia

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ABN 41 010 922 335
Print Post PP424022/00254
ISSN 1447-0446

FROM THE EDITOR

This special Land Warfare edition concentrates on the changing roles and composition of military forces in prosecuting the land battles of today and tomorrow.

Post Afghanistan, Carlo Kopp poses the question, "Where to next for Western land warfare capabilities?"

It's been a long summer of civil war in Libya. A new contributing author, Peter Layton, examines the land/air war that led inexorably to the fall of the Gaddafi regime.

Australia is keeping a close eye on French Tiger ARH operations in Libya, as the Australian Army plans its operational future with its squadrons of Tigers. Nigel Pittaway has a special report on Tiger's first warlike mission.

The new Chief of Defence Force, General David Hurley outlines to Sergei DeSilva-Ranasinghe the lessons learned from Operation Solace in Somalia, and its impact on subsequent Australian Army operations.

Carlo Kopp examines the dramatic evolution of Battlefield Intelligence, Surveillance and Reconnaissance over the past decade, as a result of COIN campaigns.

Strategically, an unstable Yemen could be fast becoming Al Qaeda's new Islamic Emirate. David Eshel examines why this is a potential threat to United States and Western interests.

The first RAAF KC-30A Multi Role Tanker Transports have been delivered, late and not fully operational. Nigel Pittaway provides an update to this program.

The promotion of civil-military relations is becoming a vital element of any military campaign. Sergei DeSilva-Ranasinghe discusses this topic with Michael Smith, Executive Director, Asia Pacific Civil-Military Centre of Excellence.

John Armstrong
Editor

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An Australian Army Tiger Armed Reconnaissance Helicopter (ARH) fires a rocket at Woomera Test Facility during the Rocket Acceptance and Testing Trial. (Defence)

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INTERVIEW

Post Afghanistan - Where to next with Western land warfare capabilities

Dr Carlo Kopp

> The biggest challenge Western land forces must confront is not technological, but rather ideological, as the Gates 'next-war-itis' doctrine is very popular in bureaucratic and political circles in the West, compounded by a very poor understanding of modern foreign threat systems.

The global proliferation of guided munitions has changed the character of land warfare. Depicted: an Iraqi armoured column destroyed in 1991, a conflict where guided munitions were first used en masse.

THE prospect of Western military intervention forces being withdrawn from Afghanistan over the next three years is very real, after more than a decade of COIN operations against Al Qaeda and Taliban forces. Whether the withdrawal is earlier or later, and regardless of whether Afghanistan is left in a viable or non-viable state once the West departs, the important longer term question is that of what Western land warfare capabilities should be in a post-Iraq and post-Afghanistan era.

Proponents of COIN operations will inevitably argue for more COIN capabilities, whereas proponents of conventional warfighting will argue the opposite. While this debate is discussed separately, ideologically driven over-reaction to short term COIN campaign needs over the past decade has already seriously damaged Western air power and sea power, with consequential impacts on Western land forces.

Guided Munitions and Land Warfare

No less importantly from a land warfare perspective, the character of the conventional land warfare environment is changing globally, with Precision Guided Munitions entering land force, air force and naval inventories globally, and in respectable numbers. Until the 1990s, guided munitions were mostly a Western and Soviet monopoly, with the West holding most capability. With a globalised free-for-all market and commodification of much of the basic technology used to construct weapon guidance kits, the Western monopoly collapsed over the last two decades. Subject to political alignments, most nations can today procure guided munitions from the US, EU, Israel, Russia or China, and also some former Soviet Republics.

When an Israeli missile boat was sunk by a Chinese designed, Iranian supplied anti-ship missile launched by Hezbollah militia troops in Lebanon, the global reaction was along the lines of "...but insurgents do not operate precision guided munitions!"

In a globalised commodity driven world where any developed nation can manufacture guided munitions, global proliferation is an inevitability. The notion that nations with an early industrial age or pre-industrial domestic technology base cannot successfully operate modern high technology weapons is wishful thinking. What may have been true for Cold War era weapons, built from maintenance intensive and technically difficult analogue technology, is simply not true for sophisticated sealed self-test equipped digitally guided weapons. Whereas a Cold War era smart weapon demanded extremely well trained and educated operators and maintainers, highly automated contemporary weapons are more than often designed for little or no pre-launch maintenance, and ease of operational use by poorly trained and educated personnel.

Put simply, the assumption that a nation's rudimentary domestic technology base is a barrier to using sophisticated high technology guided munitions is no longer true. Nations with basket-weaving level domestic technology can deploy, funds permitting, highly sophisticated guided weapons.

This is an important change that will produce impacts in a number of areas. A failure to properly address the advent of battlefield guided munitions will leave Western land forces in a position no less precarious than the advent of gunpowder centuries ago. This is not an overstatement, as in both instances a new technology significantly increased the effective reach and lethality of projectile weapons, and armies that failed to properly adapt suffered subsequent defeats. While

the advent of gunpowder mostly improved weapon kinematics, precision digital weapon guidance increases lethality at all ranges, this as a result providing long range indirect fire weapons with lethality comparable to or better than traditional shorter ranging direct fire weapons.

The Western political pre-occupation with COIN campaigns in Iraq and Afghanistan has produced some highly destructive strategic effects in the West over the past decade, while Russia's economy has slowly recovered from the post-Soviet slump, and China's economy has boomed, fed by Western commercial investments and consumer demand for cheap commodity manufactured goods. Russia and China have become major manufacturers and exporters of guided munitions, typically supplying nations denied access to Western weapons.

The common argument heard in the West today is that "our PGMs are better than their PGMs so it does not matter." This may or may not be true, but is largely irrelevant. Nations the West might have to confront will be launching guided weapons rather than dumb weapons.

To put this in context, the 1991 rout of Saddam's forces in Kuwait and Southern Iraq was performed using a mix of 1960s, 1970s and 1980s technology guided weapons, and supporting targeting systems. A contemporary Russian or Chinese built digital missile seeker will be closest in technology to Western designs developed during the 1990s, and often remaining in production today.

The Russian response to Desert Storm, emulated since by the Chinese, followed two separate tracks of development. One track was to develop and deploy analogues or sometimes direct copies of Western guided munitions, or to produce guided derivatives of existing designs. The other track was to make their weapons systems more survivable, which has resulted in improved mobility, the deployment of a new generation of Counter-PGM weapons, and robust electronic and optical countermeasures to defeat smart weapon seekers and GPS midcourse guidance kits.

The top tier of Russian and Chinese smart weapons are ground launched conventional cruise missiles such as variants of the Novator 3M54 / SS-N-27 Sizzler, and the Chinese CJ-10. Both compare closely to the 1980s and 1990s variants of the BGM-109 Tomahawk series. These are deployed on surface combatants and submarines for coastal attack, aircraft for attacking any targets, but importantly are also deployed on 8x8 all terrain vehicles, or in the instance of the 3M54, ISO containers for deployment on semi-trailers, railway cars or container ships.

These weapons are paralleled by terminally guided battlefield tactical ballistic missiles, such as the Russian Iskander, a replacement for the venerable Scud. These weapons are typically equipped with optical image correlator seekers, which can be highly accurate.

The next tier down includes terminally guided long range artillery rockets such as the Chinese SY-400 and BP-12A. The BP-12A has a cited range of 400 km, making it competitive against both cruise missiles and TBMs.

With less range but also lower cost come terminally guided or satellite aided long range artillery shells, such as the Russian Krasnopol series, modelled on the Martin-Marietta Coppehead laser guided artillery round.

Finally, there are a number of direct fire weapons in the market, including less conventional choices such as the Russian Buk M2E / SA-17 Grizzly medium range Surface Air Missile (SAM), which has a land target attack mode in which the SAM is fired against a ground target with good radar contrast.

Most operators of Russian and now Chinese supplied combat aircraft now have access to a wide range of laser, electro-optical and more recently, satellite inertial guided bomb kits. China and Russia have domestically built laser targeting systems for aircraft, and Russia recently licenced manufacture of the first generation French Thales Damocles thermal imaging targeting pod. The Chinese recently entered the guided bomb market, with laser and satellite inertial guided bombs and glidebombs, the latter already exported to Pakistan.

In this type of battlespace, the traditional FEBA (Forward Edge of the Battle Area) model collapses. Any potential target within 500 km of an opposing missile launcher is at risk, as is any target which hostile aircraft can gain access to.

The limitation at this time faced by users of Russian and Chinese battlefield deep attack guided weapons is no different than that confronted by Western nations in the past, which is the collection of timely targeting intelligence to prosecute attacks. While satellite imagery is viable under good weather conditions, it is not timely, and can be compromised by good camouflage and frequent movement. The traditional Western standby of using Special Forces teams then becomes a viable option. While Russia and China lag the West in RPV/UAV technology, unless stealthy, these are not survivable in contested airspace.

The global proliferation of modern guided munitions is changing the character of land warfare.

Operating Under Hostile Guided Munitions Fire

The last conflict in which Western military forces were frequently exposed to hostile guided munitions fire was between 1943 and 1945, when Germany's Luftwaffe deployed the Hs-293 rocket propelled glidebomb, the much heavier Fritz X free fall glidebomb, and a radio-navigation aided variant of the A-4/V-2 ballistic missile was deployed by Waffen SS missile batteries.

Despite rudimentary guidance technology and effective Allied electronic countermeasures against radio command uplinks, German glidebombs inflicted heavy damage on shipping, especially at the Anzio anchorage, and were used with some success against Allied held bridges. Antwerp, a key resupply node, suffered heavy damage and loss of 30,000 lives as a result of V-2 bombardment, severely disrupting resupply efforts.

This was the impact of 1940s technology guided weapons, almost primitive in comparison with contemporary technology.

Since then Western land forces have enjoyed decades during which exposure to hostile air and missile attack has been infrequent. In 1982, the British suffered losses to Argentinian air attack in the Falklands conflict, and some Coalition force losses were suffered in 1991 when Saddam's regime bombarded Saudi Arabia with Al-Hussein/ Scud ballistic missiles, technologically not much better than the A-4/V-2 used in 1944-1945.

The limited exposure to air and missile attacks reflected in part the overwhelming advantage of dominant Western air power, which denied hostile aircraft access, and in part the character of the opponents being fought, mostly equipped with obsolete Soviet era equipment. The future will be very different.

The unchallenged two decade long dominance of Western air power is now dissipating, as a result of the confluence of two trends. The first is that Russia and China are now developing and soon to manufacture genuine stealth fighters, which will be very difficult to stop by conventional air defences.

The other much more worrisome trend is the collapse of the funding and future technology base for properly recapitalising Cold War era fleets of Western combat aircraft. This means that Western air forces will no longer be able to play offensively and penetrate in strength hostile or contested airspace to destroy opposing air bases and air forces on the ground. The latter is the most viable strategy for defeating opposing stealth aircraft, and many deep attack ground based weapon launch systems. Advancing air defence technology will render most contemporary standoff weapons and cruise missiles ineffective, and it is absolutely lethal to all legacy Western combat aircraft.

The result of this shifting balance, a shift which could still be reversed if conventional warfare was still taken seriously in Western defence bureaucracies, is that Western land forces now

Land forces exposed to unhindered attack by guided munitions have suffered enormous casualties. Depicted an Iraqi column of vehicles hit in 1991, and a T-55 tank hit in 2003.

need to plan for a future in which exposure to air attack by guided munitions, and standoff attack by battlefield guided munitions, are both of high probability.

Staying alive in the battlespace will require a deep rethink of operational doctrine and also where investment is made in equipment and standing forces.

Clearly hardening of vehicles across the whole spectrum will be essential. Logistical vehicles from heavy trucks down to 4WDs will need at a minimum to be resistant to the blast overpressure, shrapnel and the spalling effects of guided munitions warhead near misses. Suffice to say a direct hit by a 50 kilogram or greater warhead will typically destroy or cripple a main battle tank, and any softer vehicle will be destroyed completely. Unhardened vehicles will become a liability in this type of environment, as they will be easily disabled or damaged even if the munition at best achieves a near miss. As the IED experience shows, soft vehicles simply result in large numbers of dead or maimed personnel, the latter incurring major short, medium and long term impacts.

Mobility has been a feature of Western land force doctrine since the 1940s, and this needs to be revisited, since mobility remains one of the best defences against guided munitions. The challenge in increasing mobility is twofold, insofar as heavier vehicles being moved more frequently will increase the total fuel burn of any deployed force, while logistical sites and weapon or fuel dumps which are not relocated frequently will be lost.

Electronic and electro-optical countermeasures to defeat guided munition seekers need to be become widely deployed on land force vehicles, including larger logistical vehicles, as these are high value targets in deep attack against resupply chains.

Phalanx C-RAM system. While highly effective in the C-RAM role, this system lacks necessary improvements to perform effectively in the C-PGM role.

The latest variant of the Russian KBP 96K6E Pantsir S1 SPAAGM incorporates a Janus-faced phased array acquisition radar specifically developed to defeat saturation attacks by high speed guided munitions.

Left and top: Even low intensity bombardment by Iraq's rudimentary Scud / Al Hussein missiles, lacking precision guidance, produced enormous disruptive effect in the 1991 Desert Storm campaign. Contemporary terminally guided ballistic missiles and cruise missiles would produce far greater damage and personnel losses.

Bottom right: Remains of a Dhahran warehouse hit by a single unguided Al Hussein ballistic missile on the 25th February, 1991. Twenty seven personnel were killed and one hundred injured.

Making targeting more difficult by increasing mobility, reducing vehicle susceptibility to attack by munition seeker jamming, and reducing vehicle vulnerability by hardening will not prevent the use of guided munitions, and at best reduce their effectiveness.

Destroying munitions in the terminal phase of flight is a technique adopted in the West with some success in C-RAM (Counter - Rocket Artillery Mortar) systems, and in Russia especially in C-PGM (Counter - Precision Guided Munition) systems, primary deployed as organic self protection for long range air defence missile batteries and to protect critical national infrastructure.

During the Cold War the United States and European NATO allies deployed a robust Integrated Air Defence System, with the MIM-104 Patriot providing the upper tier capability, the MIM-23 Hawk providing the intermediate tier capability, and the Chapparel, Roland, Gepard, Crotale and Vulcan providing the bottom tier terminal defence capability. Two to four decades old, many of these systems are now of marginal effectiveness against newer threats, and EU NATO nations have sold off many systems as surplus. Few of these systems have the mobility required to keep pace with a rapidly advancing manoeuvre force element. The mobility of battlefield air defences was always a lower priority for NATO, playing the defensive game, compared to the Warsaw Pact, who played the offensive game and deployed genuine 'shoot and scoot' battlefield SAM and SPAAG systems since the early 1960s.

Upgrading and updating Cold War era SAMs and SPAAGs for the C-PGM role will not yield good results, as most of these weapons were designed to engage and kill aircraft, especially low flying aircraft. Radar design optimisations, and often weapon kinematic profiles will be suboptimal for C-PGM operations.

The first generation of Russian C-PGM systems, deployed over the last five years, were derivatives of late Cold War period weapons, and not fully optimised for the C-PGM role. The latest variant of the 96K6 Pantsir S1 or SA-22 Greyhound is optimised, employing a new Janus faced acquisition radar.

Existing Western C-RAM systems, such as the Phalanx, are like the first generation of Russian C-PGM systems, not optimised for manoeuvring low signature fast weapons on steep terminal dive profiles. Nor do they have the 'shoot-and-scoot' mobility required to protect manoeuvre forces or logistical supply convoys on the move.

Western land forces will require a deep overhaul of their organic battlefield air/missile defence capabilities, with new capabilities optimised for the emerging guided munition centric battlefield environment. Replacing legacy battlefield air/missile defence capabilities with newer but otherwise similar designs is not sufficient.

Key capabilities which will be required include:

Very high mobility of all components, especially SAM systems, SPAAGMs and SPAAGs; Acquisition radar optimisations to defeat PGM targets, more challenging than RAM targets; Engagement radar optimisations to defeat saturation PGM attacks; Early warning capabilities, especially VHF/UHF band radars with counter-stealth capabilities; Organic C3 capabilities to permit highly autonomous operation.

The basic technology is available in both the US and EU nations to solve this problem both quickly and efficiently. Many existing designs could be adapted or evolved, as the Russians have done over the last decade. Moreover, High Energy Laser (HEL) and High Power Microwave (HPM) Directed Energy Weapons (DEW) have great potential in the C-PGM role, although neither are the panaceas they are often presented to be.

The biggest challenge Western land forces must confront is however not technological, but rather ideological, as the Gates 'next-war-itis' doctrine is very popular in bureaucratic and political circles in the West, compounded by a very poor understanding of modern foreign threat systems. Doing nothing and not spending is always attractive where the consequences of same are future rather than immediate problems, especially in a challenging funding environment.