

# Army Guide monthly



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## Contracts

### Czech Government Approves Purchase of 107 Pandur Armoured Carriers



Czech Defence Minister Vlasta Parkanova can now sign the contract.

"About 153 percent of offsets have been agreed. Most of them, I would say, are direct offsets. A number of Czech firms will take part in the production," Topolanek said.

The purchase of the APCs has been talked about since 2003.

Topolanek said today the delay has caused the military marked problems with operational capabilities at home and mainly in foreign missions.

Topolanek said money has been earmarked for the purchase in the state budget.

"The keeping of the average unit price agreed during the negotiations was a condition for the contract," he said.

The then government agreed with the purchase of 240 APCs in 2003. Steyr, which is part of General Dynamics, won the tender in 2006 and the agreed price exceeded 23.5 billion crowns.

In 2007 the government decided to withdraw from the contract after Steyr failed to keep the contract conditions.

In January 2008, Steyr was given one more chance to supply a lower number of APCs, however.



## Defence Industry

### Textron to Build 15 Additional Armored Security Vehicles for US Army



NEW ORLEANS, LA. -- Textron Marine & Land Systems, an operating unit of Textron Systems, a Textron Inc. company, has been awarded a \$10.9 million contract modification by the United States

Army Tank-automotive and Armaments Command (TACOM) to build an additional 15 Armored Security Vehicles (ASV).

With the contract modification, TACOM is exercising an option in the existing contract. Since the inception of the program in 1999 a total of 2,667 ASVs have been contracted, with 1,922 vehicles delivered to date.

"The requirement of the U.S. Army for additional ASVs reinforces our pride in the effectiveness of the vehicle and the people that build it here in Louisiana," said Textron Marine & Land Systems General Manager Tom Walmsley. "The on-time delivery and efficient manufacturing record of our employees is eclipsed only by the performance of the ASV in combat protecting our soldiers and carrying out missions whenever called upon."

The ASV has maintained exceptional operational readiness and combat availability rates over the life of the U.S. Army program as vehicles log more than 30,000 miles per year in combat operations. Textron Marine & Land Systems has achieved more than 40 consecutive months of on-time delivery to the U.S. Army on the ASV program.

The ASV is a 4X4 wheeled armored vehicle that offers significant crew protection through the employment of multiple layers of armor, defending against small arms fire, artillery projectile fragments, Improvised Explosives Devices (IEDs) and land mines. This advanced armor is exceedingly lightweight and, along with its dimensions, allows the vehicle to be able to "roll-on/roll-off" C-130 military transport aircraft.

The ASV possesses superior mobility, agility, handling and ride quality through the utilization of a four-wheel independent suspension system. Textron Marine & Land Systems has equipped the M-1117 ASV with a specially designed dual-weapon station that, unlike many other vehicles, enables the crew to load, reload and clear gun jams under full armor protection.

With minor modifications and appropriate outfitting, ASV variants can perform a wide variety of missions including scout, infantry personnel carrier, reconnaissance, command and control and recovery. Current missions of the ASV include operations with the Military Police, convoy protection, as well as Field Artillery Combat Observation and Lasing Teams (COLT) with the M-1200 ASV variant. Its record of performance, reliability and survivability in the field is impeccable in U.S. Army operations around the globe.



## Defence Industry

### 800 SIT V1 BMS Ordered for the French Army

The French Defence Procurement Agency (DGA) has placed an order on Nexter for 800 SIT V1 Battle Management Systems (BMS) in order to equip 400 Infantry Combat Vehicles (VCI).

This contract includes a new version of the software which increases the interoperability of the SIT V1 with

the other information systems in use by forces through the "SIC TERRE" joint operations. This contract also includes technical control and maintaining in operational condition (MCO) of the SIT V1 systems for 10 years.



The qualification of the SIT V1 BMS was pronounced by DGA in August 2007 following operational evaluation trials, which were conducted successfully by the 1st Foreign Cavalry Regiment, equipped with modernized AMX 10 RC tanks, VB2Ls and VBLs. The engagement in external operations by the regiment in Ivory Coast in 2007 and now in Afghanistan has additionally confirmed the excellent behaviour of the SIT V1, and in particular its ease of use and the operational benefits of this command system.

This new contract signed by DGA raises to over 1 200, the number of combat vehicles fielded by the French Army, which will be equipped with the SIT V1 information system.

To date, 400 systems are already deployed by the French forces on the Leclerc tank, the AMX10RC, the VCI and the VBL.



## Contracts

### Delivery Of The First Batch Of Nimr For UAE Armed Forces



After several years of intense efforts and investments, Bin Jabr Group's NIMR 4X4 vehicles began active operations when the first batch was delivered to the UAE Armed Forces in January.

This high-mobility, multi-mission platform will successively equip various operational units from the logistic, signal, air defense and combat branches. As the first automotive industrial defense company in the whole middle east, Bin Jabr Group, emirates company, is planning to invest several million US dollars in building a second factory in Abu Dhabi in 2010.



## Defence Industry

### Macedonia Purchasing 200 BTR Armored Vehicles from Ukraine



NEWTOWN, Conn. -- The Macedonian government is prepared to purchase 200 BTR 4 "Bukefal," armored personnel carriers (APCs) from Ukraine's Kharkiv Morozov Machine Building Design Bureau, according to reports in Interfax.

While the Macedonian Defense Ministry was not able to completely verify Interfax's account, a spokesperson did confirm that an APC purchase will be forthcoming in the near future.

The size of the reported order, however, is sure to draw criticism, since the Macedonian Army needs no more than 110 APCs to fill out its ranks as the country tries to gain acceptance into the NATO Alliance. In order to comply with NATO requirements, Macedonia will procure 30 new APCs by the end of 2009, with a total of 80 in service by year-end 2015.

The Finnish Patria AMV, the Austrian Steyr Pandur, and the Swiss MOWAG Piranha are all preferred options at the moment. The BTR-4 is modeled after the Russian BTR-80, 12 of which the Army of the Republic of Macedonia (ARM) currently has in its service.

The Ukrainian deal seems to hinge on two things: good relations between the two countries, and the possibility of building a new plant in Macedonia where final assembly of the new vehicles would occur. Once this step has taken place and the requisite technical skills of the workers and proper infrastructure are in place, the plant would then move toward full production of the BTR 4s.

The Macedonian government will likely need the offsetting industrial work share in order to justify the project to its public at a time when the economies of Europe are in a tailspin and numerous infrastructure needs remain for the country.



## Future Technologies

### QinetiQ wins demonstrator programme to investigate use of 610V technology in military vehicles

QinetiQ has won and started to deliver on a J3.5m contract to investigate how the generation and distribution of electrical power on defence vehicles can be improved by using 610 Volt technologies against a background of ever increasing demands for electrical power.

QinetiQ has established and leads a team including BAE Systems and Provector Ltd to deliver this contract. The programme runs through to the end of 2009 and will demonstrate improved electrical power capability in Armoured Fighting Vehicles (AFVs).



Awarded by the MOD Future Business Group, this Technology Demonstration Programme will see the existing 28 Volt system uprated in a demonstrator Warrior 2000 AFV to one that can generate and safely distribute electrical power at 610 Volts for high demand loads, yet still deliver 28 Volt supplies to existing equipment.

Today in addition to the standard vehicle electrical equipment, driveline, management systems and communications kit, most AFVs and Protected Patrol Vehicles will include advanced situational awareness, sensors, personnel and vehicle cooling systems, various other power-hungry systems plus a growing array of future technology – all of which place an increasing burden on the existing 28V generating systems. This high voltage architecture and system is also directly applicable to the wider military vehicle fleet and will be used to inform the development of power generation and distribution systems for future vehicles.

The programme builds on QinetiQ's extensive vehicle electrical power and propulsion research and development experience and its expertise in the design of high efficiency permanent magnet electrical machines. This expertise will be used to produce designs for a compact main engine generator and for a completely new auxiliary power unit. Each generator will have an output that is double that of the original Warrior generator – effectively quadrupling the vehicle's power generation capability, while providing much greater flexibility in power management and control.

"This team will deliver a best-in-class solution within a demanding timescale," explained Chrys Stevenson QinetiQ Platform Systems Sales & Marketing Director. "A significant milestone has already been achieved as the programme passed its Critical Design Review. We are now bringing together the equipment necessary to commence integration on a rig prior to installation in to a Warrior based prototype vehicle later this year. The programme continues to demonstrate the effective working relationships established between the three main companies that builds on their respective technical

strengths to quickly demonstrate the potential for this technology."

David Wragg, the BAE Systems' IPT Leader for Emerging Programmes supported this and added: "This is an exciting programme that will demonstrate how technology insertion can sustain the growing electrical power requirements for both new and existing land platforms plus contribute to setting the design standards for future vehicles and requirements."

Jim McMenemy, Project Manager within the MOD Future Business Group concluded: "I am very pleased with the progress already made by the team on this very important project. The output will inform vehicle IPT's of the potential introduction of this technology which could dramatically improve the overall electrical power capability of our vehicles."



## Defence Industry

### Force Dynamics, LLC Receives Award for Cheetah M-ATV Vehicles



Ladson, SC -- Force Dynamics, LLC, a joint venture between Force Protection, Inc. and General Dynamics Land Systems, a business unit of General Dynamics, today announced that it was awarded a contract for two Cheetah light weight, high mobility Production Representative Vehicles (PRVs) as part of the U.S. Army Tank-Automotive and Armaments Command (TACOM) Mine Resistant Ambush Protected All Terrain Vehicle (M-ATV) program.

The value of the award is \$1 million. The two vehicles were delivered on February 23rd and met the government's initial requirements. The Cheetah vehicle, which has been in development since late 2005, previously successfully passed testing to MRAP I survivability levels and has undergone initial mobility and durability testing at the Nevada Automotive Test Center.

Damon Walsh, executive vice president for Force Protection and program director of Force Dynamics, commented, "Delivery of these first test vehicles and the subsequent sale to TACOM is an important milestone gate in the M-ATV competition. We have long believed that there was a need for a lightweight, highly mobile and highly survivable tactical wheeled vehicle to supplement the current fleet. We are proud, not only to have pioneered the MRAP category of vehicles with our Cougar MRAP, but to have foreseen – through the development of the Cheetah – the need to evolve the category with enhanced mobility to navigate the rugged terrain and wider variety of missions that characterize the

conflict in Afghanistan. Our troops can't afford to choose between mobility and survivability; they deserve both and the Cheetah was designed to meet this very requirement."

The Cheetah provides the same level of survivability as the Cougar at approximately half the curb weight. The M-ATV Cheetah incorporates several improvements to the original FPI Cheetah, including independent suspension, additional interior capacity, and a significantly increased power-to-weight ratio. Cheetah is well positioned to meet the two most important criteria of the selection process: survivability and mobility.

The strong partnership between Force Protection and General Dynamics Land Systems as well as a strong suite of OEMs and partners will allow Force Dynamics to successfully execute on the aggressive procurement schedule required to deliver this urgently needed survivability solution to the conflict in Afghanistan. Together, Force Protection and General Dynamics have successfully delivered over 3,000 Mine Resistant Ambush Protected (MRAP) Category I and Category II vehicles under the MRAP program. Force Protection has commenced low-rate production of the Cheetah at its Ladson, South Carolina, facility and Force Dynamics has begun to procure long-lead materials to move from limited to extended production of Cheetah vehicles.

Mike Cannon, chairman of the board for Force Dynamics and vice president, Ground Combat Systems, at General Dynamics Land Systems, commented, "We are confident that the respective strengths of each of the partners contributing to this effort position our submission extremely well. We believe we offer an unmatched combination of research and development expertise; manufacturing ability and an excellent logistics network to our customer. We are excited to enter the testing and evaluation phase of the M-ATV program and to have the continued opportunity to serve our customer and the war fighter with some of the most important and life-saving equipment on the battlefield."

#### **About Force Protection, Inc.**

Force Protection, Inc. is a leading American designer, developer and manufacturer of survivability solutions, predominantly ballistic- and blast-protected wheeled vehicles currently deployed by the U.S. military and its allies to support armed forces and security personnel in conflict zones. The company's specialty vehicles, the Cougar, the Buffalo and the Cheetah, are designed specifically for reconnaissance and urban operations and to protect their occupants from landmines, hostile fire, and improvised explosive devices (IEDs, commonly referred to as roadside bombs). The company also is the developer and manufacturer of ForceArmor™ an armor package providing superior protection against explosively formed projectiles (EFPs) now available for a wide range of tactical-wheeled vehicles. The company is one of the original developers and primary providers of vehicles for the U.S. military's Mine Resistant Ambush Protected, or MRAP, vehicle program.

#### **About General Dynamics Corp.**

General Dynamics, headquartered in Falls Church,

Va., employs approximately 92,300 people worldwide. The company is a market leader in business aviation; land and expeditionary combat systems, armaments and munitions; shipbuilding and marine systems; and information systems and technologies. More information about the company is available on the Internet at [www.generaldynamics.com](http://www.generaldynamics.com).

#### **Force Protection, Inc. Safe Harbor Language**

This press release contains forward looking statements that are not historical facts, including statements about our beliefs and expectations which are forward-looking statements. These statements are based on beliefs and assumptions by Force Protection's management, and on information currently available to management. Forward-looking statements speak only as of the date they are made, and we undertake no obligation to update any of them publicly in light of new information or future events. A number of important factors could cause actual results to differ materially from those contained in any forward-looking statements. Examples of these factors include, but are not limited to, the ultimate selection of Force Dynamics under the M-ATV Program, our ability to fulfill any order for the Cheetah on a timely basis, our ability to effectively manage the risks in our business, the reaction of the marketplace to the foregoing and other risk factors and cautionary statements listed in the Company's periodic reports filed with the Securities and Exchange Commission, including the risks set forth in the Company's 2007 Annual Report on Form 10-K for the year ended December 31, 2007 and Quarterly Report on Form 10-Q for the period ended September 30, 2008.



### **Defence Industry**

#### **Ridgback Tested for Helmand**



The first batch of the new Ridgback protected vehicles are currently being tested by the Army, and are expected to be going to work in Afghanistan later this year.

Lighter and more agile than the Mastiff Armoured Fighting Vehicle, the Ridgback, though very similar, is nearly two metres shorter but, crucially, a metre slimmer than its big brother, allowing troops greater access and mobility within built-up environments.

While manoeuvrability is its special feature, it is passenger-protection that remains paramount. Ridgback is mine and IED (improvised explosive device) strike-proofed to the same level as a Mastiff 2; just as

heavily armoured but nine tonnes lighter.

As with Mastiff, the base vehicle is the American Cougar. These are shipped to Coventry where NP Aerospace up-armours then unleashes the new beasts for the Ministry of Defence.

The 4x4s become Ridgbacks and the 6x6s become the Mastiffs soldiers know and love. In sharing the same basic platform and major components, Ridgback benefits from the proven support and training regimes already in place for Mastiff.

Among the upgrades fitted at Coventry, Ridgback incorporates an impressive electronics pack including Bowman communications, electronic countermeasures, night vision and thermal imaging. The multi-camera feeds to the TV screens inside give the crew impressive situational awareness from within the vehicle.

Some vehicles will be fitted with a remote weapons system allowing the crew to operate Ridgback's weapons via a camera and joystick from inside the vehicle.

Other attributes include run-flat tyres, modified seats offering superior protection from bomb blasts, and easy gear selection and driveability.

Jason Purveur, Ridgback project manager, said:

"We had infantry support us throughout the whole design and development process. All of the attributes that they think they will need in theatre we try and accommodate within the build of the programme. My hope is that they get exactly what they want."

Once out of the factory, Ridgback is put through its paces in a series of tough mobility tests at the Army's Combat Support Trials and Development Unit (CSS TDU) at Long Valley, Aldershot.

To enable it to carry out different roles within Afghanistan Ridgback will be introduced in four variants: a troop-carrying protected weapons station, a remote weapons station, a battlefield ambulance, and a command post vehicle.

Although the vehicles are very tough, they are certainly not indestructible, and the Ridgback team is keen that its drivers and battlefield commanders "don't try to write cheques the vehicle can't cash by putting it to uses it's not designed for".

Mr Purveur had the following message for front line troops and commanders eagerly awaiting the arrival of the vehicles in theatre:

"Bear with us - we're getting them out to you as fast as we possibly can. Fingers crossed, when you receive them you'll appreciate everything that we've done, and most importantly, that they'll keep you guys safe."

RIDGBACK VITAL STATISTICS:

- Top speed: 55mph (90km/h)
- Weight: 19.5 tonnes
- Weapons: A mixture of weapons systems, including a 7.62mm Heavy Machine Gun; General Purpose Machine Gun; and Grenade Machine Gun mounted.

various targets on the battlefield. It is determined by the main armament calibre, projectiles' piercing capability, characteristics of the armament laying mechanisms, sights, aimed firing rate, ammunition loading speed, quantity of vehicle-borne ammunition, available ammunition types, availability and calibre of machine guns and quantity of vehicle-borne machine-gun ammunition.



The tanks' main armament is a smooth-bore or rifled gun (most of modern tanks are fitted with smooth-bore guns). The guns are used for direct fire, although indirect fire is also possible. The latest tanks are armed either with 120 mm gun (NATO calibre) or 125 mm gun (originated in the former Soviet Union). советский калибр»). The gun barrels are usually fitted with a thermal sleeve.

The tank guns can fire various types of ammunition intended for destruction both armoured and unarmoured targets: armour-piercing fin-stabilised discarding sabot (APFSDS), high-explosive squash-head (HESH), also called high-explosive plastic (HEP), high-explosive anti-tank (HEAT), high-explosive fragmentation (HE-FRAG), smoke, canister, etc. The main anti-tank ammunition types are APFSDS and HEAT (the former penetrates the armour by means of a long-rod penetrator made either of special steel or tungsten allow or depleted uranium, while the other, by using a high energy jet of melted copper allow).

The smooth-bore guns can also fire laser beam-riding anti-tank guided missiles which can destroy targets at distances of up to 5 km (while APFSDS and HEAT rounds are only effective within distances of up to 3 km).

The modern tanks are armed with at least two machine guns, one of which is mounted coaxially with the main gun, while the other is installed on the turret roof and is used for firing at both ground and air targets.

## Defence Industry

### Northrop Grumman to Supply Land Navigation Systems for Republic of Korea's New Infantry Fighting Vehicle

FREIBURG, Germany -- Northrop Grumman Corporation has announced that it has been awarded a contract by Korean military systems and vehicle manufacturer Doosan DST Co., Ltd. to

## Term of the day

### Tank Firepower

The firepower of a tank is its ability to destroy

deliver inertial navigation units for the Republic of Korea's new K21 infantry fighting vehicle (IFV).

The LLN-G1 units will be built by the company's German navigation systems subsidiary, Northrop Grumman LITEF.

The LLN-G1 is a hybrid land navigation system based on state-of-the-art fibre optic gyros and micro-electromechanical system (MEMS) accelerometers developed and manufactured by Northrop Grumman LITEF in Freiburg, Germany. Combining inertial sensors with an odometer and GPS data, the LLN-G1 provides accurate and uninterrupted three-dimensional position and attitude data for vehicle commanders and crews.

"Unjammable situational awareness in combination with gyro-compassing is exactly what the commander of a modern IFV like the K21 needs to effectively carry out his mission. Normally found in high-end inertial reference systems, the gyro compassing capability enables the LLN-G1 to establish precise heading without the use of a magnetic compass," said Norbert Sandner, director of marketing and sales for Northrop Grumman LITEF. "This new contract for the series production phase of the K21 IFV is the second LLN-G1 order for the K21 vehicle, and we are pleased that our systems have again been chosen as an integral part of one of the most advanced IFVs currently available."

Northrop Grumman LITEF is a leading supplier of inertial sensors, inertial reference and inertial navigation systems and computers with products deployed in more than 30 countries in aircraft, naval and ground mobile applications worldwide. The company's land navigation systems are used by the armed forces of more than 20 countries, from 4x4 reconnaissance vehicles to main battle tanks.

In Europe, Northrop Grumman operates from locations in France, Germany, Italy and Norway, providing navigation, air traffic control and postal automation systems. In the UK, Northrop Grumman operates from primary locations in London, Fareham, Chester, Coventry, New Malden, Peterborough, RAF Waddington and Solihull and provides avionics, communications, electronic warfare systems, marine navigation systems, robotics, C4ISR solutions and mission planning, aircraft whole life support, IT systems and software development.

Northrop Grumman Corporation is a leading global security company whose 120,000 employees provide innovative systems, products, and solutions in aerospace, electronics, information systems, shipbuilding and technical services to government and commercial customers worldwide.



### Defence Industry

## Counter-IED variant gives Thales's Bushmaster extra edge

A new variant of the Bushmaster Protected Mobility

Vehicle is currently being delivered from Thales's Bendigo facility, destined for Dutch forces operating in the Oruzgan province, Afghanistan.

The nine vehicles are equipped with an interrogation arm designed to help crews uncover, investigate and examine suspect items such as Improvised Explosive Devices (IEDs) from within the Bushmaster. Each arm is fitted with a camera and metal detector to assist in this activity.

The result of a request from the Netherlands Ministry of Defence, the new variant demonstrates Thales's extensive systems integration expertise in Bendigo, as well as the flexibility of the Bushmaster as a platform for new capabilities.

When delivered, the company will have supplied 58 Bushmasters to the Netherlands.

Chris Jenkins, Thales Australia's Managing Director, said the increasing threats posed by IEDs were a driving factor in technological innovation.

"The Bushmaster's flexibility allows us to incorporate new capabilities and systems, which offer troops increased levels of protection as they carry out their duties.

"We are very pleased to deliver this solution to the Dutch military, and welcome their close collaboration in designing, testing and manufacturing the new Bushmaster capability.

"Thales is the only company with the capacity to design and manufacture world leading protected mobility vehicles.

"We are very proud of the contribution to defence force safety by this unrivalled local expertise gained over many years of hard work, with many highly skilled employees creating what is a unique centre of excellence in regional Victoria in Australia."



### Defence Industry

## SAIC Awarded \$41 Million Delivery Order by the U.S. Army to Support Joint Improvised Explosive Device (IED) Defeat Test Board (JTB) Functions

Science Applications International Corporation announced it has been awarded a delivery order by the U.S. Army Evaluation Center (AEC) to provide technical and business process support for planning, development and execution of Joint Improvised Explosive Device (IED) Defeat Test Board (JTB) objectives.

The delivery order has a one year base period of performance four one-year options and a total value of more than \$41 million if all options are exercised. Work will be performed primarily in Alexandria, Va., and Aberdeen, Md. The delivery order was awarded under the Evaluation Support for the U.S. AEC contract.

The IED - JTB focuses all Department of Defense (DoD) actions in support of the combatant commanders and their respective joint task force efforts to defeat IEDs as weapons of strategic influence. Under the contract, SAIC will provide information and analysis used by the

government to assist in making decisions concerning counter-IED systems in war zones. SAIC will also provide information to the warfighter about the characteristics and function of deployed systems, and help maximize (through testing) the utility of counter-IED defeat initiatives throughout DoD.

"We look forward to supporting the AEC and the IED - JTB in the rapid testing of potential solutions to defeat IEDs, using fast-paced test and evaluation skills to help get solutions in the hands of our warfighters quickly," said Charles Zang, SAIC senior vice president and business unit general manager.



## Defence Industry

### Hagenuk Marinekommunikation to develop HF module for the Bundeswehr's new generation of joint radio systems

The Federal Office for Information Management and Information Technology of the German Armed Forces (Bundeswehr) has commissioned the ATLAS subsidiary Hagenuk Marinekommunikation GmbH (HMK) to develop the HF radio module for the Bundeswehr's joint radio systems (SVFuA).

The order also covers the corresponding accessories, such as power amplifiers and antenna interface equipment.

The SVFuA systems provide the basis for the Bundeswehr's future generations of software defined ra-dios (SDRs). These next-generation mobile radio systems will be based on the standardized Software Communications Architecture (SCA). They can then be deployed as network nodes and also as terminals with loadable narrowband and wideband waveforms.

Hagenuk Marinekommunikation GmbH has gained an outstanding reputation worldwide as a specialist for HF technology. Since the early 1980s, the Bundeswehr has relied on the HF units produced by HMK, which were procured for both stationary and mobile operations.

More than 1000 VLF-HF receivers, more than 300 HF transceivers of the output classes 125 W, 500 W und 1000 W as well as HF transmitters with an output of 10 kW have been delivered to date. All units are suitable for LINK operations, and some models are designed for the frequency hopping mode according to NATO regulations.

The implementation of a high-performance 10 kW transmitter, with subsequent series production, was a particularly successful development contract for the Bundeswehr IT Office.

Hagenuk Marinekommunikation GmbH is proud that the governmental customer is continuing its proven partnership with HMK by commissioning the HF components for the new generation of radio systems.



## Robots

### Oshkosh Defense Teams With Naval Surface Warfare Center to Test New Uses for Unmanned Ground Vehicles in the Field



OSHKOSH, Wis. -- Oshkosh Defense, a division of Oshkosh Corporation (NYSE:OSK), announced today it is working in conjunction with the U.S. Naval Surface Warfare Center (NSWC) to develop and evaluate potential new and innovative uses of the company's autonomous technology. As a result, Oshkosh will gain the military application data needed to refine its autonomous technology and move it closer to production.

The NSWC will be sponsoring these cooperative operations, which will involve Oshkosh's unmanned ground vehicle (UGV), TerraMax™, and take place at Eglin Air Force Base in Florida. TerraMax is based on Oshkosh's Medium Tactical Vehicle Replacement (MTVR) 4x4, and the NSWC will investigate the use of TerraMax as a Roboticized-MTVR (R-MTVR) in different mission-specific scenarios. If successful, the work could lead to new uses of UGVs and autonomous technologies on the battlefield.

"Oshkosh Defense is excited to be breaking new ground in the autonomous-technology field with the NSWC," said Andy Hove, Oshkosh Corporation executive vice president and president, Defense. "We are still in the early exploratory stages of finding ways we can make missions safer for our soldiers through the use of UGVs, and opportunities such as these are important first steps."

TerraMax features the Oshkosh Command Zone® drive-by-wire technology, which allows computer-controlled steering and direct electronic control of the acceleration, braking and transmission systems. The vehicle also features a light detection and ranging (LIDAR) system, camera-based vision and a GPS/IMU system for operation and navigation purposes.



## Defence Industry

### Super digger ordered for Royal Engineers

A new fleet of tracked armoured earthmoving engineer vehicles, which will give the Royal Engineers a powerful and versatile route-clearing and earthmoving capability, are to be built at BAE Systems' Newcastle factory.



Under a J300m contract, the Royal Engineers are getting 60 air-portable Terrier vehicles which will become one of the most important engineering tools in their inventory.



Terrier will support infantry troops by removing obstacles and opening routes, providing useful assistance on operations including peacekeeping and humanitarian missions.

Minister for Defence Equipment and Support Quentin Davies said:

"Terrier will be a hugely powerful and versatile machine, like a cross between an armoured vehicle, an excavator and a loader, and I am pleased to confirm this order for our highly skilled Royal Engineers who provide vital battlefield support to the infantry and front line troops.

"Designed in Leicester and integrated by BAE Systems in Newcastle, the order is also good news for British industry as over 90 per cent of the manufacture will be supported by companies from across the country, demonstrating the great level of skills and workmanship we have in the UK."

Terrier, which weighs in at 30 tonnes, has a crew of two who sit in a state-of-the-art crew compartment. The vehicle's armoured chassis will allow it to safely operate in a combat environment and, when required, remote-control operation can be used.

As a powerful tracked vehicle Terrier will be able to negotiate almost any terrain, and its earthmoving bucket and side-mounted excavator arm will make short work of digging and obstacle clearance tasks. The bucket can be quickly replaced with a surface mine clearance device which, combined with a route-marking system, can be used to clear routes of surface-laid munitions

Based on recent operational experience MOD has made changes to the vehicle design to provide additional protection against mine attacks and vehicles will be equipped with extra armour to prepare them for operations when they now enter service in 2013.

Construction work will begin on the production line at BAE Systems' Newcastle site in 2010, supported by its sub-contractors who span the breadth of the UK.

The Terriers will be equipped to fulfill a variety of military tasks. The bucket at the front and the side-mounted excavator arm will enable the two-man crew to carry out a variety of digging and carrying operations, predominantly to clear routes for other vehicles and deny routes to opposition forces.

Its quick-hitch mechanism means the bucket can be rapidly dropped and replaced with other front-mounted equipment including a device for clearing mines from road surfaces. Similarly, the vehicle is designed so that

different tools can be fitted to the side excavator arm enabling it to be used to dig holes, lift objects, drill into the ground or shatter concrete.

The vehicle will also be able to tow the 18-tonne fully-loaded engineer trailer and deploy fascines (pipe bundles for filling ditches) and trackway (rolled metallic sheets to create temporary road surfaces) to assist other vehicles in moving around the battlefield.

The vehicle's environmental control system will allow the crew to work comfortably in all conditions from desert to arctic, and thermal imaging cameras permit both day and night operation.

Most tasks can also be conducted by remote-control from over one kilometre away, with onboard camera systems providing the operator with a close-up view. The vehicle is also equipped with advanced diagnostic analysis software enabling the crew to keep the vehicle working to its optimum capacity.

The combination of transmission, suspension and track provide impressive agility allowing Terrier to keep up with both Warrior and Challenger, whilst the vehicle's armoured hull and general purpose machine gun provide protection for the crew.

Despite being over eight metres long and 30 tonnes in weight Terriers can still be transported in either the C17 Globemaster or the future Airbus A400M military transport aircraft.

