**TOPIC 3/2**

**MOBILITY support tasks AND FUNDAMENTALS**

Military forces require the ability to move rapidly and freely in the area of operations in order to fulfill their primary mission. Mobility is necessary to achieve concentration of effort and to deploy rapidly to engage or to disengage from the adversant. Superior mobility may compensate for numerical inferiority and is affected by terrain, weather and adversant activity.

**The Threat.** In the context of the changed operational environment already described in section 1, adversant counter-mobility operations of whatever type, are likely to focus on stopping or slowing NATO forces so as to fix them in some form of target area or they may simply attempt to prevent our freedom of manoeuvre. The means employed to accomplish these aims, may include use of air delivered assets as well as the use of land mines (including scatterable mines) and IEDs. Natural obstacles and damaged infrastructure will also be enhanced in order to create effective obstacles and thereby seek to limit NATO mobility options.

Increased use of the urban environment will present a range of new threats and opportunities for a determined adversant and will require the development of engineer capabilities to deal effectively with this challenging potential threat to own force mobility.

**The Concept.** All arms/branches will attempt to bypass or overcome obstacles and maintain mobility by use of their own integral resources and efforts. In manoeuvre warfare when obstacles are encountered, the following actions will be attempted in the order shown so as to retain tempo and initiative:

* Bypass.
* Overcome the obstacles using integral support.
* Deploy specialist obstacle crossing resources.

The maintenance of tempo and mobility in the face of an effective obstacle, whether laid by the adversant or not, will depend on the following:

* An early assessment of the likelihood of obstacles to be crossed.
* Deployment of the force in an appropriate manner, in order to overcome likely obstacles speedily as they are encountered.
* Early detection and reconnaissance of obstacles.
* Effective drills and procedures.

**Main Tasks.** In supporting the mobility of all arms/branches, the main engineer tasks are:

* Gap Crossing. Including wet and dry gaps.
* Countermine Operations. The detection, reconnaissance, marking,bypassing, breaching and clearance of mined areas.
* Counter Obstacle Operations. The breaching, bypassing or reduction of obstacles other than gaps or mined or booby trapped areas.
* Routes. Developing and improving routes for tactical movement.
* Support to Forward Aviation. Tasks may include the construction, repair and maintenance of forward airstrips and the preparation of landing areas (such as Forward Operating Bases (FOBs) and Forward Arming and Refueling Points (FARPs).
* Explosive threat Management. Those tasks related to minimizing the risk of explosive ordnance, both manufactured and improvised, to friendly forces. It includes all actions from the provision of advice and engineer intelligence to deliberate actions to dispose of specific explosive threats, such as disposal, search and EOD/IEDD tasks4. Note that this task is not exclusively a mobility task. These tasks can be executed as survivability tasks in cases where their execution is not linked to the movement of friendly troops. This task can also be executed by different branch specialist. In fact, for some nations, the functions to mitigate explosive threat can be assigned to non-engineers (logistics or others). Nonetheless, this task is a MILENG responsibility as defined in the Alliance.
* Route Clearance: Route Clearance is an enabling task that can be conducted in conjunction with and in support to other mobility tasks to achieve and maintain freedom of movement. Route Clearance is defined as: the detection and if found, the confirmation, the identification, marking and neutralization, destruction or removal of explosive ordnance (EO) and non-explosive obstacles threatening a defined route to allow a military operation to continue with reduced risk. Route Clearance is covered in ATP 3.12.1.3 Route Clearance Doctrine.
* Area Clearance: Area clearance is a mobility task, under the MILENG Support to Joint Functions manoeuvre and fires; of which some components fall under force protection. Area Clearance focuses on vulnerable points and suspicious areas to reduce the risk posed by explosive ordnance (EO) and non-explosive obstacles. In land operations, area clearance is the detection, confirmation, identification, marking, neutralization, destruction, and removal of EO and non-explosive obstacles in a defined area to allow a military operation to continue with reduced risk.
* Military Search: Search is the capability to locate specified targets (may include people, information and material resources employed by an adversary) using intelligence assessments, systematic procedures and appropriate detection techniques and materials.

**MOBILITY SUPPORT TO OFFENSIVE OPERATIONS**

A range of engineer activities will be required to support the offence. Mobility is vital to achieving success in offensive operations and therefore engineer support will be central in maintaining the speed and momentum of an attack. In this way, the joint force commander can seize the initiative and achieve surprise by his selection of the timing and direction of attack. Counter-mobility tasks, particularly flank protection, the fixing of adversant counter-attacks forces and the closure of adversant withdrawal routes, are also important. Engineers will be required to support attacking forces by any or all of the following actions:

* Breaching, marking or opening our own, as well as adversant minefields.
* Providing the means of crossing rivers or other obstacles.
* Securing the flanks by means of minefields, demolitions and other obstacles. These also help to shape and structure the battlefield and may allow commanders to use economy of force measures for force protection.
* Preparing and maintaining routes for follow-up echelons.
* Supporting the consolidation on the objective by digging, laying minefields and creating obstacles.
* Route Clearance

The achievement of these functions depends on adequate reconnaissance, timely provision of the necessary equipment and stores, and on the proper grouping and control of engineer elements, particularly minefield breaching and gap-crossing armored vehicles.

**Movement.** Engineer units must follow the general rules for movement laid down for all arms/branches. They may move either as separate movement serials or with elements integrated into a support unit’s plan.

**Planning Moves.** The engineer commander will participate in planning the movement of the supported formation. He will use engineer intelligence to recommend routes, by-passes or necessary reconnaissance to the tactical commander.

**Route Reconnaissance.** Engineers should be included in route reconnaissance parties. They should ascertain whether the condition and capacity of the routes are adequate; if not, remedial actions, such as diversionary routes, restrictions and the reinforcement of bridges, are to be planned. In addition a route assessment should be done.

**Engineer Support to Movement.** It will normally be the responsibility of the inplace force to maintain routes within its area. Engineer tasks in support of movement will include:

* Engineer reconnaissance.
* Establishment of by-passes.
* Clearance of obstacles and explosive threats.
* Building of bridges.
* Damage Repair.
* Road Upgrades.

**Engineers in the Moving Formation.** In order to maintain the momentum of movement, engineer detachments will usually move as, or with, the first movement elements. Engineers may be required to pre-deploy some engineers into the theatre of operations in order to:

* Clear EO and non-explosive obstacles.
* Deal with scatterable mines.
* Fill craters and repair route damage.
* Bridge gaps.

If engineer tasks are to be accomplished during the preparation for operations by formations, engineer units will frequently have to move independently. In this case, the commanders of the engineer units will be responsible for movement and for movement security. If necessary, they should request the protection of air defense and other units during the move.

**Crossing and breaching obstacles**

Any obstacle can be overcome given sufficient resources and time. However, in an attack, the combined arms/branches commander must attempt to force his way to the other side of the obstacle before the adversant can fully organize defensive preparations. Leading elements determine the extent of the obstacle and seek a bypass. If there is no bypass is possible, the tactical commander will attempt a hasty breach/crossing of the obstacle, without loss of momentum, using the resources immediately available to him.

If an obstacle cannot be overcome, a deliberate breaching / crossing operation will have to be carried out which requires new orders, bringing up additional breaching and/or crossing resources, and the employment of specific breaching and/or crossing procedures.

**Crossing Operations.** Crossing operations may be carried out in three overlapping phases:

* Assault, to gain a lodgement on the far side of the obstacle. This phase is not required for an unopposed crossing.
* Build-up, to extend the lodgement into a bridgehead.
* Consolidation, to establish a firm base within the bridgehead from which to break out and continue the overall operation.

**Forces and Tasks.** Forces employed in a crossing operation may be organized as follows:

* Bridgehead Force. The bridgehead force consists of an assault echelon and a main body. The assault echelon is tasked with gaining the lodgement, normally by seizing intermediate objectives. The main body conducts the build-up phase and participates in the consolidation phase. Within its area of responsibility the force has normal responsibilities for security including the far side of the obstacle.
* Break-out Force. The break-out force is tasked with the continuation of the overall operation. This force will conform to the bridgehead force regarding use of ground in the bridgehead. In some circumstances the break-out may be an additional task for the bridgehead force.
* Force in Place. When an allied or national force is already in place along the obstacle it may be called upon to assist the bridgehead force during the crossing. A passage of lines will occur as the bridgehead force and the break-out force pass through the force in place.

**Minefield Breaching.** Minefield breaching will invariably be part of a combined arms/branches operation. In many instances the minefield will be merely one of a series of obstacles to be breached; the overall obstacle, in this instance, is described as “complex”, thereby posing a considerable challenge to engineers. Increasingly such breaching may take place in an urban setting, reflecting the realities of the contemporary operating environment.

* **Reconnaissance.** The task of determining the boundaries of a minefield is an all arms/branches responsibility. The physical reconnaissance within a minefield is an engineer responsibility.
* **Locating Minefields.** Modern reconnaissance and surveillance techniques as well as information obtained from maps, terrain analysis and/or other sources enable a commander to determine likely mined areas. The use of all arms/branches reconnaissance, supplemented by engineer reconnaissance well forward, will provide timely advice on minefield locations thus allowing a commander to adjust the deployment of his force and position breaching equipment so that it can be used quickly. It is essential that planning and preparations commence before the obstacle is reached.
* **Minefield Composition.** It may not always be necessary to determine the exact composition of a minefield, particularly if a combination of explosive breaching and other methods is used. However, if a deliberate operation is to be conducted, it is advantageous to determine the composition of a minefield prior to breaching. As a minimum, the width, depth and details of adversant weapons covering the minefield are essential.
* **Breaching.** Breaching may be conducted as a hasty or deliberate operation, by hand, mechanical or explosive means, or using a combination of means. Once lanes are established they are marked in accordance with STANAG 2036.
* **Hasty Breach.** An attacking force will attempt to breach from the march using breaching resources within the force. Very little reorganisation of the assault echelon is required and SOPs may be developed for breaching to commence with little or no additional orders being given. Engineer support will come from resources on hand. The scope of engineer support can include reconnaissance, provision of advice, and the breaching, proving, marking and maintenance of lanes.
* **Deliberate Breach.** If a breach cannot be conducted from the march or if the obstacle is too complex to be crossed using the resources on hand, deliberate breaching will be attempted. The resultant loss of momentum has to be accepted as more time is required for reconnaissance, planning and the buildup of necessary resources. Engineer support to the deliberate breach is extensive. Timely and accurate intelligence is required to determine the extent and composition of the minefield, and hence the structure of the breaching force. This force normally consists of infantry, armour, engineers, indirect fire support and close air support (CAS). Engineer support to a deliberate breach is likely to include the following:
* Detailed reconnaissance of the minefield to determine locations of mine rows and types of mines.
* Provision of engineer advice to commanders.
* Provision of special engineer equipment and personnel to assist in the conduct of the breach.
* Proving, marking and maintenance of lanes.

**Short Gap Crossing.** Preparation for the crossing of short gaps must be preceded by map and terrain analysis as well as air and ground reconnaissance to determine gap locations, widths and the grouping of engineer resources to support manoeuvre units. Short gaps are normally crossed from the march by combat units employing organic engineer support or using expedient means. Armored engineers employing fascines, vehicle-launched bridges and armored engineer vehicles will be the likely means of crossing short gaps. Vehiclelaunched bridges will normally remain in place to be crossed by follow-on elements and some logistics, and eventually be replaced by support bridging. In addition to the preparation of crossing sites, engineers will also mark the immediate approaches and exits in accordance with STANAG 2036.

**Opposed Water Crossing Procedures.** Water crossing operations will be conducted in accordance with STANAG 2395.

* **Deliberate Crossings.** When a water obstacle cannot be crossed from the march, using existing bridges, fording, swimming or on-hand bridging resources, and the assaulting force is in contact with the adversant, a deliberate crossing operation will have to be carried out. The crossing may be conducted in three overlapping phases: assault, buildup and consolidation. Two main forces may be involved: a bridgehead force and a break-out force. The critical functions of a water crossing are: security, movement control, terrain control and crossing support.
* **Movement Control.**
* Planning and control of movement across water obstacles is the responsibility of the tactical commander of the crossing operation. He must be aware of the effect that the composition of forces needed on the far side of the obstacle will have on these functions and develop his crossing plan accordingly.
* The movement control organisation will be responsible for ensuring a coordinated and effective movement to and from the crossing sites.
* Unit Commanders will be responsible for the movement of their own forces subject to the instructions of the movement control organisation and crossing site commanders.
* Engineer Advice. Each level of command in a water crossing operation will normally have an engineer who is responsible for the technical aspects of executing the crossing.
* Communications. The crossing plan must take into consideration the need for key communications nets. These may include nets for tactical command, movement control and engineer command.
* Other Support. Recovery and medical services should be readily available so that delays are minimized.

**Routes for Tactical Movement.** Despite the improved mobility of modern combat and logistic vehicles, engineer support will be required to open and maintain multiple routes for tactical movement. Keeping routes clear of obstacles and mines is a particularly important task for land forces engineers to ensure tactical mobility and sustainment of the force. Such routes and lanes must also be properly marked for friendly forces in accordance with STANAG 2036.

* **Route Reconnaissance**. Reconnaissance is required to determine the availability and trafficability of routes. Existing route networks must be checked and limitations or shortfalls identified. The reconnaissance must then determine what additional routes must be provided, taking account of the resources available.
* **Routes for Combat Vehicles**. Routes primarily for use by combat vehicles are normally designed and constructed to carry limited traffic for relatively short periods. Requirements for construction will vary based on local conditions.
* **Routes for Logistic and Other Wheeled Traffic**. Routes for wheeled traffic in the forward areas are usually built to support a moderate volume of traffic. The construction effort is likely to be more extensive than for tracked combat vehicles but similar techniques will be used; maintenance teams will be required. Routes can be subsequently upgraded if they are to be used more extensively.

**Support to Forward Aviation.** The types and sophistication of aviation ground facilities will vary but they may be characterized by limited numbers of aircraft and short periods of use. During the preparation of such facilities, expedient techniques are used and construction is limited in order to reduce the chance of adversant detection. The types of support which may be provided are:

* Construction of helicopter landing sites (HLS); FOBs and FARPs.
* Construction of landing strips, including the adapting of roads and other hard surfaces for use by aircraft.
* Maintenance and repair of existing airfields, landing strips and other facilities.
* Preparation of drop zones.

**MOBILITY SUPPORT TO DEFENSIVE OPERATIONS**

During preparations for defensive operations, engineers will reconnoitre, improve and open routes for use during the battle. These may include lanes through barriers, routes from hides to battle and alternate positions and those for maintenance, re-supply and counter moves.

Routes. When the main defensive battle is joined, the maintenance and improvement of routes will be a major engineer task. Adversant interference by artillery, air forces and scatterable mines, plus the requirement for off-road movement, may require the deployment of counter- mine equipment, assault bridging, trackway and engineer heavy equipment well forward. It is vital that NATO forces be able to manoeuvre freely in the defense so as to be able to concentrate and strike the adversant at the optimum place and time. The same importance is given to maintaining key routes in Other Operations and this will pose particular problems when Lines of Communication (LoC) are extended over long distances and are subject to asymmetric attack.

**Minefield Gaps and Lanes.** Careful planning and coordination with the combat arms/branches will be essential to ensure that the required lanes or gaps are left in minefields or other obstacles for the redeployment of troops and to facilitate counter moves. These gaps and lanes will need to be closed rapidly on order.

**Support to Counter Moves.** The adversant’s use of obstacles to mine and create tank obstacles for the protection and consolidation of his own offensive operations will require the deployment of combat engineers in support of NATO counter-penetration and counter-attack forces. They must be equipped with assault bridging, armored engineer vehicles and breaching equipment, in order to provide the combat support required.