Route Clearance Operations

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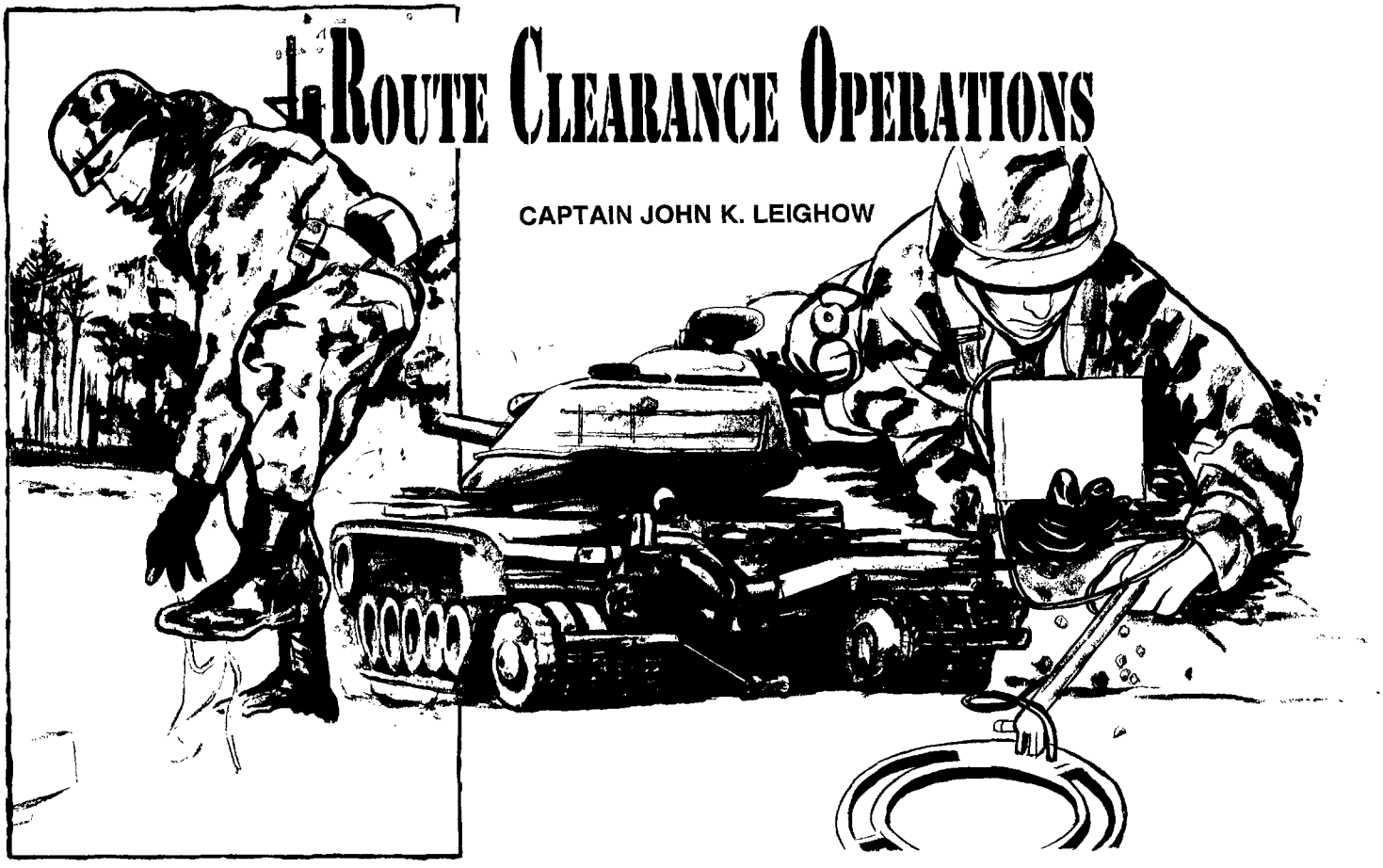

Route clearance operations are in need of major improvement throughout the Army. In conflicts ever since World War II, there has been a steady increase in U.S. casualties from mine warfare. One reason for this increase is that the development of mine technology surged while the development of countermine operations remained mired in technology 30 to 50 years old. In addition to the lack of technology, there is also a lack of definitive doctrinal guidance on route clearance operations, along with a corresponding lack of training in such operations.

At the Joint Readiness Training Center (JRTC), mine warfare is an integrated part of opposing force (OPFOR) tactics, much of it along friendly lines of communication (LOCs). Units must recognize that route clearance requires combined arms operations. Units training at the JRTC routinely attempt clearance operations without proper planning, task organizing, rehearsing, and battle tracking. The route clearance technique most commonly observed is the "Thunder Run": A unit roams the roads at 15 miles an hour or more, hoping to see a minefield, and usually detects one through the explosion of its lead vehicle.

Because countermine technology and doctrine remain limited, we as leaders of a fighting force must develop ways to compensate for these shortcomings and retain our mobility. Fortunately, there are options that will help ensure successful and safe passage on our lines of communication.

Predictive Intelligence

To examine movement along LOCs, we must first consider the typical threats. The primary threats to battlefield movement are ambushes and mines. Small arms fire is the number one killer on the JRTC battlefield. Several teams of three to five men with small arms can effectively neutralize a brigade's convoy operations using well-placed ambushes. These ambushes can occur on almost any portion of a specified route, but they typically center in areas of limited trafficability and generally require effective fields of fire as well as cover and concealment.

Mines are the number two killer; they are the poor man's weapon of choice and the eternal sentry. Mines are devastatingly effective because they can be located virtually anywhere and because targeted units often do not understand the capabilities of mines or see indicators of their presence.

Today's mines contain blast-resistant fuses or they use magnetic or seismic signatures to initiate a blast. This technology is vastly superior to the first-generation pressure fuses that are common in the U.S. inventory. Even worse is the prospect of the availability of these mines on the world market. Mines ranging from the almost primitive (wooden boxes) to the highly sophisticated (plastic and blast resistant with a magnetic time delay fuse) are cheap and available to any country that wants them.

A favorite technique of the JRTC's OPFOR is to "reseed" a minefield along a main supply route (MSR) once a vehicle or a sweep team has destroyed its mines. Although this process takes the OPFOR no more than 30 minutes, it has a profound effect upon the brigade. As the force loses more equipment and personnel to these reseeded minefields, the brigade and its battalion task forces divert more combat power to convoy escort. Commanders and staffs become frustrated, and the brigade loses the initiative. With these two typical threats in mind, we can consider a more effective approach to route clearance operations.

Incorporating the processes of the intelligence preparation of the battlefield (IPB) and the analysis of METT-T (mission, enemy, terrain, troops, and time) into route clearance operations provides a way to predict what an enemy will do to disrupt a unit's MSRs. As experience has shown, a unit that fails to conduct route clearance operations during the initial stages of an operation will lose its flexibility and initiative during subsequent operations.

The IPB and the engineer battlefield assessment (EBA) offer the ideal methods of establishing a minefield/ambush situation template. Once the S-2 and the engineer identify the most probable threat sites, the S-2 should designate these sites named areas of interest (NAIs) to focus the reconnaissance effort. Engineers trained to conduct enemy obstacle reconnaissance can work along with scouts and infantry to confirm the presence or absence of ambushes and minefields.

Minefield indicators (see box) offer a visible signature that helps a unit confirm or deny minefield locations; they also serve as a starting point for finding the enemy or his cache sites. Typically on the JRTC battlefield, the terrain permits the enemy to cache mines 50 to 500 meters from any given minefield location.

Planning Considerations

Planning and conducting route clearance during the initial phase of combat operations ensures the survival of the forces that follow. According to Field Manual (FM) 20-32, *Mine/Countermine Operations,* minefield clearance is conducted in a relatively safe environment and is "usually performed after the breaching operation by follow-on engineer forces, or any time in a friendly area of operations where an obstacle is a hazard or hinders movement."

Despite the implications of the name, route clearance operations are similar to breaching operations and should include planning and coordination for all aspects of the familiar breaching fundamentals of suppress, obscure, secure, reduce. Covert breaches require the planning of these fundamentals but not necessarily their execution, unless the situation demands it.

Task organizing for route clearance is also similar to breaching operations in that the assault element is the security element and the breach element is the sweep element, and the support element remains the same. FM 90-13-1, *Combined Arms Obstacle Breaching Operations,* contains details on planning breaching operations and provides good insights that can be applied to route clearance operations.

MINEFIELD INDICATORS

- **Damaged vehicles or dead animals.**
- **Avoidance of an area by the local population.**
- **Signs of digging or concrete removal.**
- **Disturbances in the road such as holes or grooves.**
- **Boxes or parcels along the road or shoulder.**
- **Parked vehicles, bicycles without operators.**
- **Wires on the road surface or extending onto the shoulders.**
- **Evidence of vegetation disturbance along the shoulders.**
- **Evidence of mine-peculiar supplies—wrenches, shipping plugs, wrapping paper, safety collars from fuses.**
- **Signs posted that covertly alert the local populace to the presence of mines.**
- **Evidence of disturbances in previous tire tracks.**

The significant difference between breaching and clearing operations is that breaching usually occurs during an attack, under enemy fire, to project combat power to the far side of an obstacle, while route clearance focuses on opening LOCs to ensure the safe passage of combat support organizations within an area of operation.

Most units conduct route clearance operations without much planning or coordination with adjacent units, fire support, or security elements. Planning route clearance, as with breaching, requires extensive coordination and the use of all available assets. Some planning actions for a combined arms route clearance, by battlefield operating system, are shown in the accompanying box.

Route Clearance Methods

Currently, only one route clearance method is either conducted by units or discussed in doctrine, one that could be called a **linear route clearance.** Two other route clearance options a force can use (not directly mentioned in doctrine) are the **combat clearance method** and the **combination clearance method.**

The linear route clearance method consists of sweep and security teams beginning their route clearance from Point A and completing it at Point B (Figure 1). This method provides the best assurance of covering a route. A route clearance mission that does not specify the location of a start or end point causes confusion between those who plan the

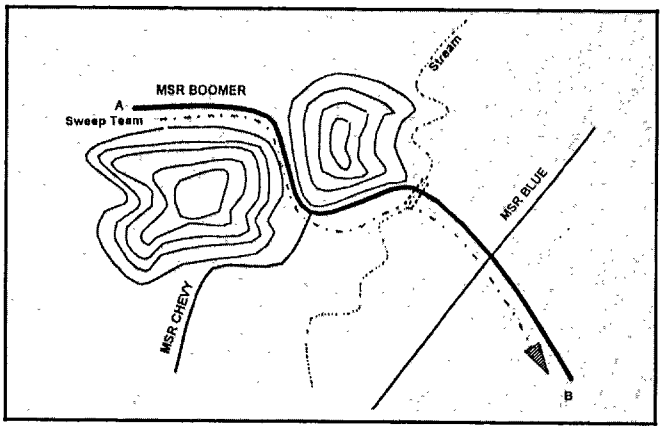

Figure 1. Linear Route Clearance

mission and those who must execute it. Although this is an effective and popular method of clearing a route, it is not the most secure in a threatening environment.

While route clearance operations focus on a specific route, combat clearance operations (discussed in FM 20-32, chapter 13) focus on one or more areas along a route. Since the IPB and EBA of a specified route can identify high-threat areas for likely mine and ambush locations, these areas become NAIs and objectives for combat clearance missions.

This method (Figure 2) divides a route into sections according to the number of suspected high-threat areas. The sweep force, consisting of a mixture of maneuver and engineer forces, secures and sweeps these areas, and the route is thus secured. Combat forces can patrol the route from these objectives to see that it is secure and can sweep the surrounding area for caches if a minefield is detected. The commander takes moderate risk in assuming that his S-2 has identified all high-threat areas and the area is clear of mines. This type of route clearance is ideal for light forces, since it provides them the maximum use of surprise and concealment instead of the constant threat involved in moving down a linear

PLANNING ACTIONS FOR A COMBINED ARMS ROUTE CLEARANCE

INTELLIGENCE

- Focus the IPB on routes to identify high threat areas such as chokepoints, bridges, culverts, tunnels, and intersections. Identify key terrain, direct observation, and ambush sites. Identify most probable locations as NAIs for reconnaissance effort.
- At battalion level, maintain a minefield incident map and chart to make pattern analysis easier. Compare minefield incidents to the situation template, and adjust accordingly.
- Coordinate overflight by unmanned aerial vehicle and attack helicopter teams to provide daily intelligence updates. Film the route using aviation assets, if possible.
- Provide intelligence updates to company and convoy team leaders before departure.
- Establish liaison between host nation, nongovernmental organizations, and special operation forces.

MANEUVER

- Clear and secure flanks (at least 100 meters in forested areas) and the far side of suspected and known obstacles before marking and clearing efforts begin. Identify and clear potential sniper positions before clearing obstacles.
- Provide scout weapons teams for route overflight and security.
- Provide subsequent security for the cleared route.
- Provide aviation assets that are under the operational control of the route clearance commander.

FIRE SUPPORT

- At battalion level, position mortars to ensure continuous coverage of the operation.
- Prepare to cue the AN/TPQ-36 weapons locating radar for counterbattery fire on enemy indirect fire systems.
- Prepare to fire nonlethal fires initially and then suppressive fires along the route on reported and suspected obstacle locations and sniper positions. Prepare fires within the tactical rules of engagement.
- Ensure that the route clearance team has a fire support coordinator.
- Ensure that priority targets shift along with company-team movement on the MSR.
- Plan smoke on each target.
- Ensure that territorial responsibility is understood.
- Establish a plan for the clearance of fires.

MOBILITY/SURVIVABILITY

- Conduct an engineer battle assessment (EBA) in conjunction with IPB of routes.
- Provide clearing and sweep teams for the route as prescribed in FM 20-32, chapter 10.
- Provide detailed obstacle intelligence on minefields that includes the description of mines, the composition of the obstacle, and enemy actions or techniques used during obstacle emplacement.
- Conduct route reconnaissance to update map information.
- Conduct deliberate minesweep operations upon visual identification of an obstacle. Continue the minesweep 200 meters beyond the known obstacle location.
- Conduct a route reconnaissance to update map information.
- Ensure that all mines and obstacles are reported, marked, and cleared to allow unimpeded movement.
- Standardize all lane marking materials and techniques.

COMBAT SERVICE SUPPORT

- Put one person in charge of the planning, specifically for support of the combined arms route clearance mission.
- Plan for both air and ground evacuation of casualties (CASEVAC).
- Provide military police (preferably with explosive-sniffing military working dogs) to help in route clearance and in security for convoys during and after clearing operations.
- Provide a medical team with one or two front line ambulances to accompany the route clearance team.
- Plan for resupply during movement.
- Consider constructing static security points along routes.
- Consider such force protection issues as providing flak vests and hardening vehicles with sandbags if possible.
- Plan for recovery assets during movement.
- Designate a movement control element for follow-on forces.

COMMAND AND CONTROL

- Plan centralized (brigade level) or decentralized (battalion task force level) route clearance operations according to METT-T.
- Designate an individual to be in charge of the entire operation with sufficient resources to accomplish the mission (communications, fire support, maneuver, and CASEVAC).
- Provide the responsible individual with intelligence on his route and area of responsibility, planning time, early task organization, and clear information on the extent of his area of operations or sector responsibility.
- Designate a controlling, coordinating, and supporting headquarters for the route movement.
- Ensure that the tasked unit has a clear mission, intent, and end state. For example, Will the unit clear the road width only, clear the entire route width including the shoulders, or clear, maintain, and secure the route?
- Determine routes with definable start and end points, and fix clearance responsibility between brigade and battalion level assets.
- Establish clearly identifiable checkpoints along routes to control traffic and monitor progress of route clearance.
- Coordinate with adjacent units as necessary. If the operation is conducted from brigade level, coordinate additional support forces with units that own the surrounding terrain.
- Track progress and integrate it into maneuver/combat service support plan.
- Ensure that ground commanders have communications with indirect fire systems, scout weapon teams, higher headquarters, and adjacent units.
- Coordinate with host nation and nongovernmental organizations.
- Designate a reserve that is at least platoon size and either mechanized or air assault capable.

danger area. This also focuses the task force on opening and securing a route for follow-on forces and moving into the countryside to find the enemy.

The third method, combination clearance (Figure 3) combines the complete route clearance capabilities of the linear method with the security and surprise elements of the combat clearance method. This is a two-phased, force-intensive operation that may require a battalion-size effort, depending upon the length of the route.

First, high-threat areas identified through the IPB and EBA are targeted as NAIs or objectives, secured, and cleared of any obstacles and enemy forces. Then the sweep team moves down the road and clears any obstacles that were missed or not identified during the planning process. The main advantage of this method is that the task force commander immediately secures his main supply routes and can push out to find the enemy with some degree of confidence that follow-on forces will be much safer.

Route Clearance Techniques

Current doctrine prescribes two types of minesweep techniques—hasty and deliberate. These techniques, which are only generally described in doctrine, should be the conceptual backbone of any mine clearance operation.

The hasty technique relies upon *speed* of execution while the deliberate relies upon *thoroughness* of execution. A hasty sweep over a six-kilometer stretch of road takes one to two hours (three to five kilometers per hour), while a deliberate sweep takes two to six hours (one to three kilometers per hour). Speed correlates inversely with thoroughness when

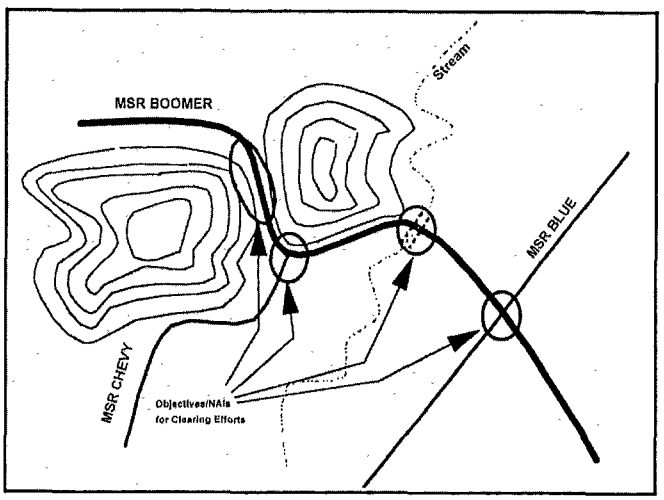

Figure 2. Combat Route Clearance

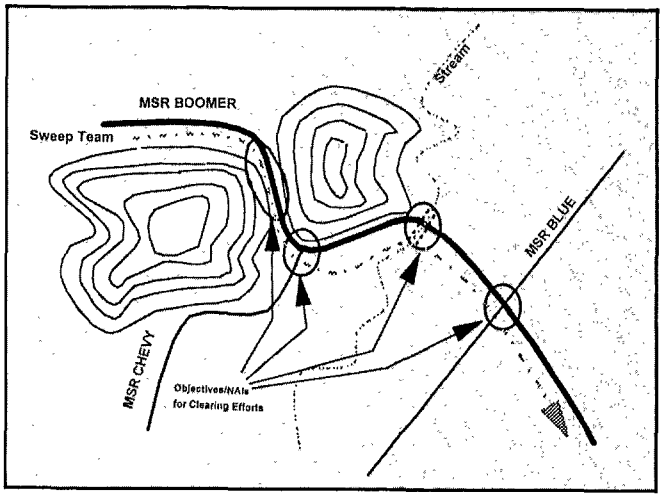

Figure 3. Combination Route Clearance

Figure 4. Minesweep Techniques Matrix

	METT-T	RISK	RATE	TASK ORGANIZATION	DETECTION METHODS	ROUTE AREAS	REMARKS
LEVEL 1	- Troops Limited - Time is Critical - Limited High Threat Areas - Rollers Available	High / Moderate	5 + km/hr	Sweep Element: Engr Sqd Sec/Spt Element: Maneuver Plt (+)	1. Visual 2. Mechanical 3. Electronic	Road width Only	- Conducted mounted or dismounted. - Must have rollers or equivalent - Uses In-Stride Breach methodology
LEVEL 2	- Same as Above except Time is important, but requires a greater use of Caution.	Moderate	3-5 km/hr	Sweep Element: Engr Sqd / Plt Sec/Spt Element: Maneuver Plt (+)	1. Visual 2. Mechanical 3. Electronic (High Threat Areas)	Road width Culverts Bridges Intersections Chokepoints	- Focus electronic measures on "high threat areas" (i.e. intersections, chokepoints, etc.). - Uses In-Stride Breach methodology
LEVEL 3	- Thoroughness outweighs time requirement. - Troops Available - Rollers may not be available	Low	3 km/hr	Sweep Element: Engr Plt Sec/Spt Element: Maneuver Co	1. Visual 2. Mechanical 3. Electronic (High Threat Areas)	Road width Shoulders Ditches Culverts Bridges Bypasses	- Optional: Route Recon Report is submitted. - Sweep/Security Element clears 100m off edge if road for off-route and CMD detonated mines. - Transition to Deliberate Breach methodology.
LEVEL 4	- Time is Available. - Troops Available - Rollers may not be available	Low / None	1-3 km/hr	Sweep Element: Engr Plt Sec/Spt Element: Maneuver Co	1. Electronic 2. Visual 3. Mechanical	Same as Level 3	- Same as Above. - Conducted Dismounted

conducting minesweep operations, and significant differences implied by each technique, such as risk and thoroughness, have not received enough elaboration in doctrine. As a consequence, units fall short in planning and executing route clearance operations.

Conducting route sweep operations in four distinct levels, for instance, would give commanders and sweeping units better options in weighing risks and clearance efforts against the desired results (Figure 4).

The proposed four levels of sweep are essentially an expansion of current doctrine: Levels one and two are modifications of a hasty minesweep while levels three and four are modifications of a deliberate minesweep. The primary differences are in the amount of operational control retained by the headquarters element and in the information communicated to the sweep element as well as the task force.

These techniques are used when conducting a linear route clearance or a combat route clearance. These sweep efforts are categorized by six criteria:

- METT-T analysis.
- Risk to traffic during and after clearance operations.
- Rate of sweep.
- Task organization.
- Priority of detection method.
- Route areas checked.

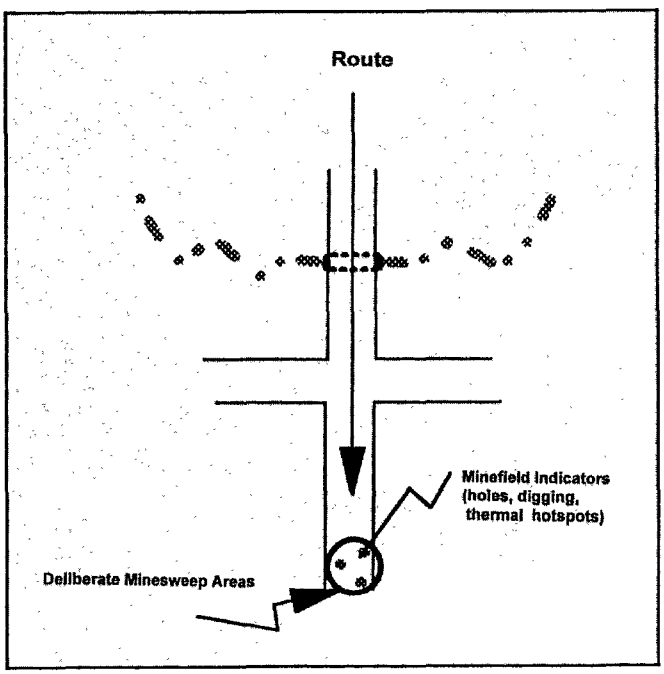

Figure 5. Level One Route Sweep

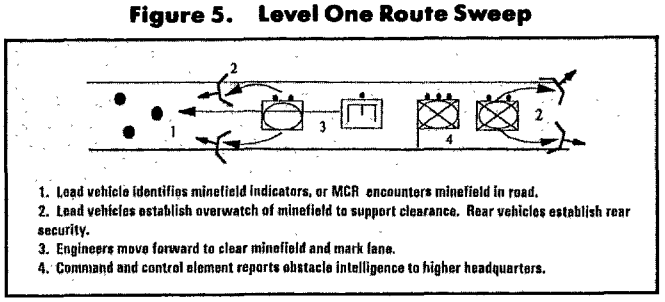

Figure 6. Level One Sweep

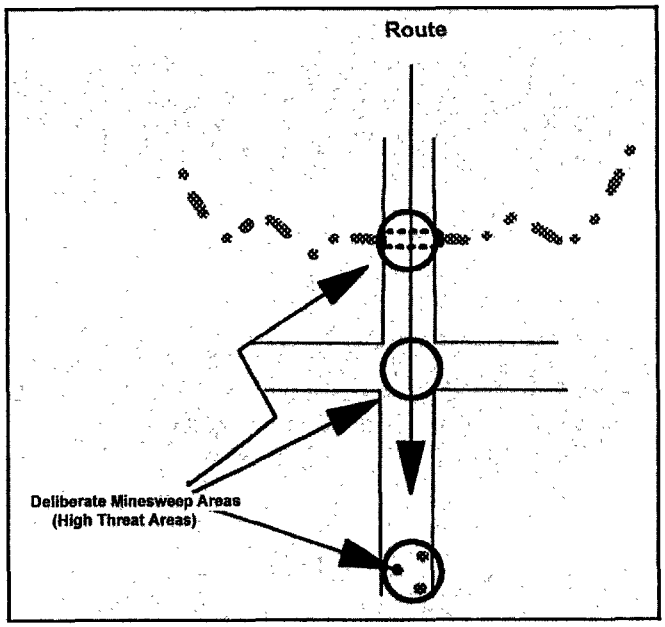

Figure 7. Level Two Route Sweep

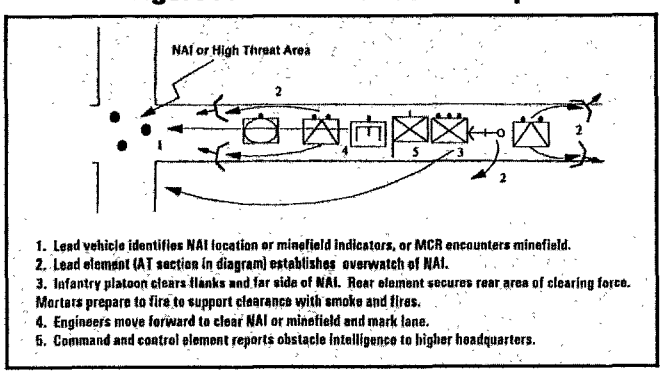

Figure 8. Level Two Sweep

These criteria provide enough information to clearly communicate the status of a route even after a sweep team has conducted its mission.

Level One. A level one sweep (Figure 5), the fastest and riskiest form of the route sweep techniques, is ideal for an armor-mechanized infantry team. It relies primarily upon visual detection for minefield identification—whether through thermal or infrared sights or with the naked eye.

Visual detection is followed by the immediate use of a mechanical detection system such as mine clearing rollers (MCRs) as a secondary system. MCRs are effective only on fairly flat surfaces, and the MCR's dog bone must be modified to avoid straddling magnetic or seismic mines.

The sweep team, consisting of an element of squad size or larger, is task organized with mine detectors, demolitions, and a vehicle-mounted mechanical detection device (see FM 20-32, chapter 10, for details). The sweep team focuses its efforts on the road width of a route, looking for minefield indicators. The security and support teams consist of a maneuver platoon to provide overwatching fire (Figure 6). The primary objective of this technique is speed, moving at roughly five to eight miles per hour. This method is much like the in-stride breach method employed when encountering

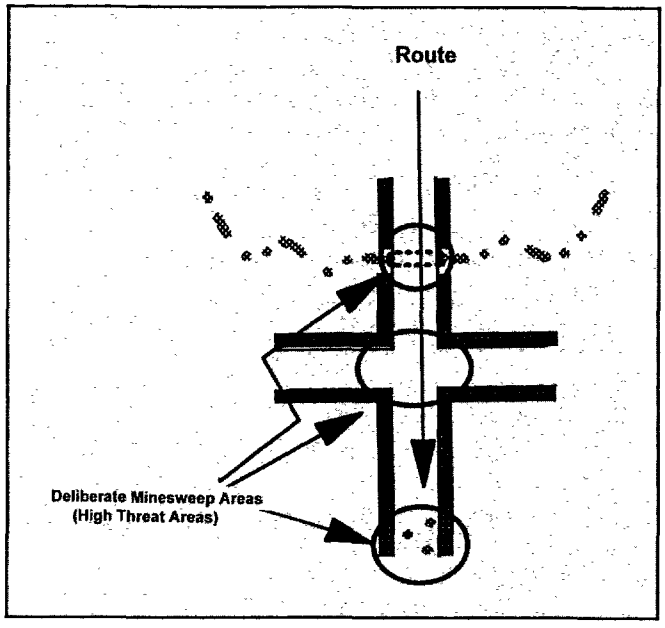

Figure 9. Level Three Route Sweep

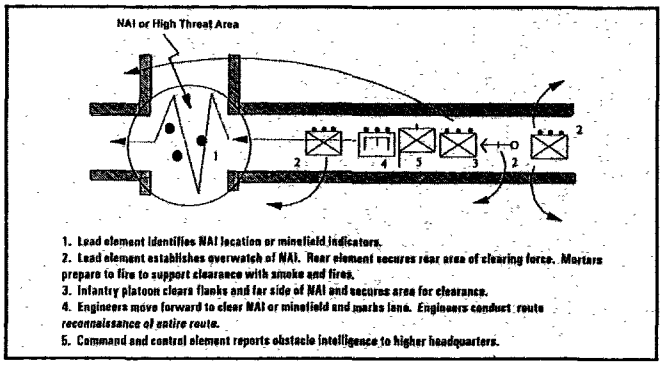

Figure 10. Level Three Sweep

minefields. The sweep team focuses upon identifying immediate risks to traffic, neutralizing those risks, and continuing with the mission.

A light force, which may not have an MCR system, can conduct the same sweep with an improvised roller system for a two-and-one-half-ton or five-ton truck. During Operation DESERT STORM, the 27th Engineer Battalion fabricated such a device to proof lanes after a mine clearing line charge (MICLIC). This device (not the truck or driver) was considered sacrificial, because it could be destroyed by a single antitank mine. Another technique is a sandbagged two-and-one-half-ton truck moving backward, but it should be used only as a last resort. Because of the high risk of encountering a minefield, the use of rollers or the equivalent is absolutely imperative. Again, however, mine clearing rollers are only a means of detecting a minefield, not of breaching it. A mine rake or plow is not a satisfactory substitute because of the damage it causes to road surfaces.

Level Two. A level two sweep (Figure 7) is similar to a level one except that it uses electronic measures, such as mine detectors, as the primary detection method at high-threat areas. Although the main focus of a level two sweep is still speed, it uses more caution and forces a unit to update its IPB considerations of the route before the mission begins.

This level of operation employs a company team (minus) for security and command and control (Figure 8). Dismounted infantrymen clear and secure the flanks and the far side of an identified minefield or NAI while an engineer squad clears the road area.

Level Three. A level three sweep (Figure 9) is more in-depth than a level two and takes more time to complete. The sweep team can be either dismounted or mounted, so long as the soldiers examine the entire width of the route, including shoulders and ditches. This ensures that follow-on forces are protected in case they need to pull off to the side of the road.

The security and support element (Figure 10) can also move dismounted or mounted to provide the rapid response and security that the unit requires. Moving dismounted provides greater security but obviously takes longer. As an alternative, the sweep team could provide a route reconnaissance to report the status of the road and to update map information. This report would reflect areas along a route that do not correspond to current maps and further identify high-threat areas along the route. Although this is slower than the previous levels, the route is safer and staffs gain information from the reconnaissance report that will be valuable during future operations.

Level Four. A level four sweep (Figure 11), the most time-

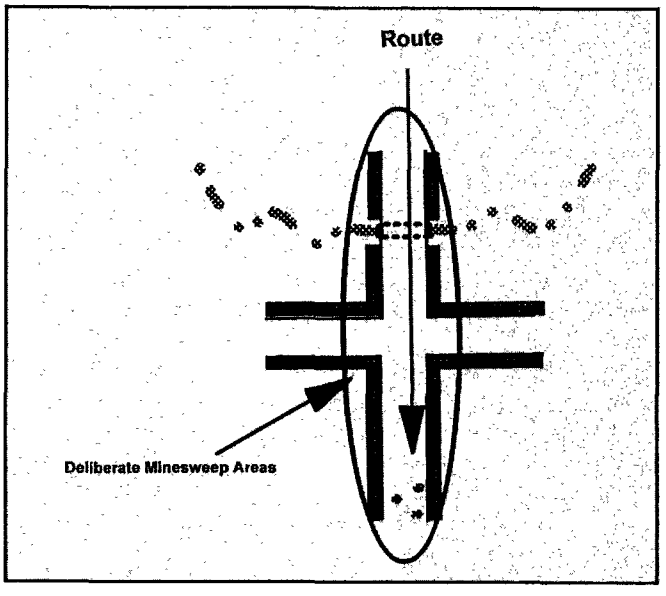

Figure 11. Level Four Route Sweep

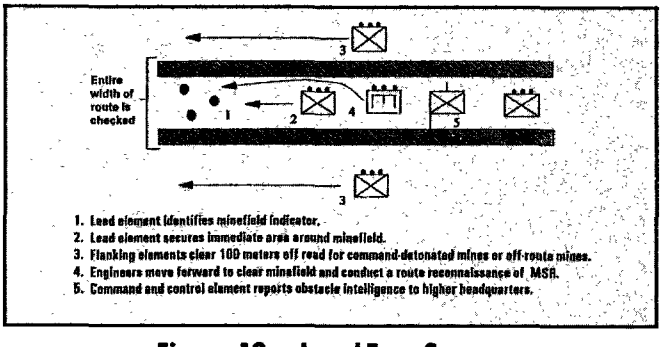

Figure 12. Level Four Sweep

consuming of the sweep operations, relies on visual and electronic means as primary and secondary detection systems. The sweep team, a platoon-size element, dismounts to focus its attention on the entire length of the route. The security element, a company-size force, clears and secures at least 100 meters in forested terrain on the flanks and 100 meters in front of the sweep element (Figure 12). This not only allows the sweep element to limit its focus to the route but also clears the area of off-route and command-detonated mines. Mechanical detection provides a third means but only as a way of proofing the route after the sweep team has passed through the area. This method is slow and tedious and should be used only when factors other than time require the added caution.

Battle Tracking

Information and its dissemination are key to battlefield management. A common deficiency in unit execution at the JRTC is a failure to report and battle track minefields and route clearance operations throughout the area of operations. Units that encounter minefields fail to provide adequate information on them, if they report any information at all.

The proposed four levels of sweep are essentially an expansion of current doctrine: Levels one and two are modifications of a hasty minesweep while levels three and four are modifications of a deliberate minesweep.

A unit that initially encounters a minefield should follow a three-step drill: secure, mark, and report. The unit must try to secure the area, if possible, before any movement. Marking should be standardized and easily seen by drivers both day and night.

A successful technique one unit used to track enemy minefields consisted of preparing a minefield chart and overlay depicting both enemy and friendly mines and obstacles, and prominently posting it in the tactical operations center (TOC) for all to see. This information included known and suspected enemy minefield locations, types of mines, marking method, time cleared, and remarks. The S-2 constantly updated the chart as information was reported. Additional information to track might be the "as of" time the chart was last updated, an obstacle number, and a list of who received the information.

A similar but separate method should be used to track route clearance status. This information should be tracked in both the TOC and the combat trains command post (CP) and pushed out to subordinate units, especially combat service support units. At brigade level, the engineer, along with the S-2 and S-3, is the proponent for tracking this information. At battalion level, the S-2 is the proponent because of a lack of available engineer personnel in the battalion TOC.

The engineer at brigade level would analyze the information and provide comments to the S-2 and S-3 on the following:

- Man-hours used to emplace the minefield.
- Weight and capabilities of the mines.
- Estimated time and assets required to clear the minefields.

The S-2 should analyze the source of the maps, how they are passed to the TOC and the trains CP, how the enemy knows when to reseed a minefield, and where the enemy might cache his mines.

The S-3 at either level is responsible for disseminating this information to every unit that uses the road networks throughout the area of operations. He should also look at the following:

- Moving air defense artillery assets to cover likely aerial resupply drop-off points.
- Tasking units to maintain surveillance on enemy minefields.
- Establishing an ambush around the minefield.
- Orienting the Q-36 radar on the location of the minefield.
- Sending in a ground force to clear the area or locate the enemy and trail him to his cache site.
- Controlling movements on routes and notifying units when the area was last cleared.

Essentially, this process brings us back to updating the predictive intelligence estimates, and the whole process begins again.

Experience at the JRTC has shown that the planning and execution of route clearance operations need a great deal of improvement. The rotational units often lose the initiative because they have not conducted enough combined arms route clearance training at their home stations. When units do conduct a route clearance, they go straight down the road, whether a sweep team is on hand or not.

And until countermine technology catches up, execution must be proficient enough to make up the difference. Even when technology improves, well-trained units will continue to be the foundation of U.S. Army operations as we enter the next century.

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