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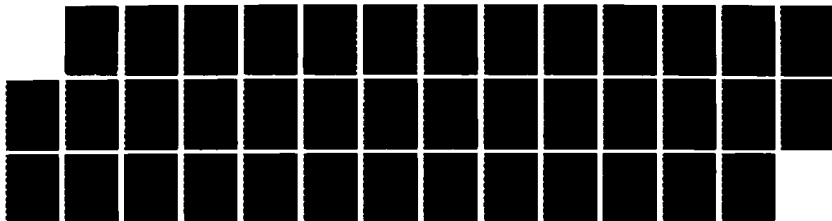
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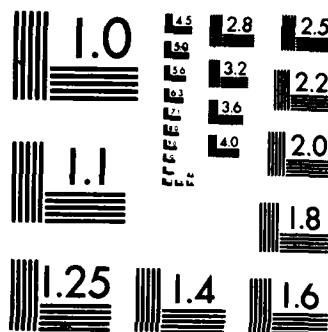
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**OBSTACLE PLANNING:
The Inadequacy of Current
Procedures to Support the
Operational Level of War**

by

Major Edwin J. Arnold, Jr.
Corps of Engineers

School of Advanced Military Studies
U. S. Army Command and General Staff College
Fort Leavenworth, Kansas

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changed to reflect top-down maneuver and obstacle planning to facilitate the complete integration of both plans at all levels. The recommended procedures incorporate operationally-significant obstacles as well as obstacle free zones.

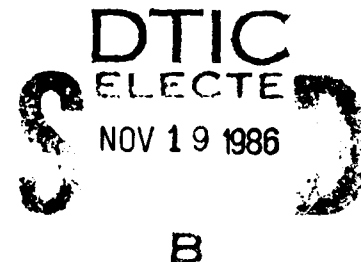
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ABSTRACT

OBSTACLE PLANNING: The Inadequacy of Current Procedures to Support the Operational Level of War, by Major Edwin J. Arnold Jr, USA, 32 pages.

This study examines current obstacle planning procedures to determine their adequacy for supporting the conduct of war at the operational level of war. The major premise of the paper is that obstacles can have a significant impact on military actions at the operational level of war and that planning procedures must allow the operational commander the ability to incorporate obstacles into his plans. Several historical examples from the two world wars show that obstacles have had operational impact during previous wars.

The study compares current obstacle planning procedures with those which would allow the operational commander the opportunity to develop a fully integrated obstacle-maneuver plan. The analysis shows that the present procedure of top-down maneuver planning and bottom-up obstacle planning is not adequate for the needs of the operational commander. Such a system permits integration of obstacles with the maneuver plan at the tactical level but not at the operational level.

The study concludes with the recommendation that obstacle planning procedures be changed to reflect top-down maneuver and obstacle planning to facilitate the complete integration of both plans at all levels. The recommended procedures incorporate operationally-significant obstacles as well as obstacle free zones.

TABLE OF CONTENTS

	PAGE
SECTION I. Introduction	1
II. Obstacle Employment	4
Obstacle Types	4
Obstacle Uses	5
Planning Considerations-Tactical Level	6
Planning Considerations-Operational Level	8
Summary	9
III. Historical Examples	10
Masurian Lakes, East Prussia, 1914	11
Siegfried Line, Germany, 1939 and 1944	11
Ardennes Forest, Belgium, 1949 and 1944	14
Maginot Line, France, 1940	14
Roer River, Germany, 1944	15
IV. Importance of Operational Obstacles	17
V. Planning Procedures	20
Proposed Planning Procedures	20
Current Planning Procedures	23
VI. Analysis	25
VII. Conclusion	28
Endnotes	30
Bibliography	31

I. INTRODUCTION

In the late 1970's and the early 1980's, the United States Army changed its primary warfighting doctrine from the Active Defense to the AirLand Battle. As this change was taking place, some leaders in the Army began to think that battles consisted of more than just tactical actions. The result of this thought was the rebirth of an interest in the operational level of war. Since that time, the operational art, the ability to fight war at the operational level, has slowly matured in the United States Army. This ongoing maturation of the operational art dictates a review of all aspects of warfighting doctrine using an operational perspective to determine what differences, if any, exist between doctrinal procedures at the operational level and those at the tactical level. Discovery of such differences in any area of warfighting doctrine must lead to thorough analysis of the differences to promote complete understanding of the relationship between tactical level warfighting and operational level warfighting. Obstacle planning and utilization is one of those areas of warfighting doctrine in which differences exist between the operational perspective and the tactical perspective.

During the years when the Active Defense was the prevailing warfighting doctrine for the United States Army, obstacle planning and employment was focused to support the FLOT (Forward Line of Troops) battle. The primary consideration for the employment of obstacles was the disruption of the advancing enemy units so that friendly units could successfully destroy them. To maximize obstacle effectiveness in this

regard, obstacle planning was generally conducted at the lower, tactical echelons (brigade, battalion) where the commanders were more attuned to the local ground conditions. Division and Corps obstacle plans were simply composites of the obstacle plans of their subordinate headquarters. Within the framework of AirLand Battle doctrine and the return of the operational art of war, such procedures are no longer appropriate. Operational commanders must develop obstacle employment considerations that preserve their freedom to conduct their operational plans. Rather than just incorporating composite obstacle plans from their subordinates into their plans, operational commanders must develop obstacle plans that support their operational maneuver plans to provide the framework within which subordinate commanders develop the obstacle plans to support their tactical battles.

This paper will analyze obstacle planning and employment from an operational perspective to determine if sufficient evidence exists within tactical and operational considerations for obstacle planning to warrant revision of current obstacle planning procedures. First, the analysis will contrast obstacle employment at the tactical and operational levels of war with a discussion of obstacle types, uses, and planning considerations. Second, the paper will use examples from the two world wars to demonstrate that armies have planned and used obstacles to achieve operational advantages over their opponents. From these examples, several key similarities will show the importance of obstacles to military actions at the operational level of war. Next, with the importance of operational obstacles thus established, the analysis will examine the planning procedures needed to support obstacle planning at the operational level.

The discussion will conclude with a comparison between current planning procedures and those proposed to support operational obstacle planning. In addition to the comparison, this final discussion will contain some recommendations about how current procedures could be changed to facilitate operational obstacle planning more fully.

II. OBSTACLE EMPLOYMENT

An obstacle is anything that stops, delays, or disrupts movement. This includes both natural and man-made features which may have significance for military actions at either the tactical or operational level of war, or both. Generally, obstacles having operational significance differ in scale from those having tactical significance. Tactically, a single road crater or minefield may be a significant obstacle for an enemy force. Operationally, an effective obstacle may require the effects of many carefully coordinated tactical obstacles to achieve the desired results. However, size alone does not make obstacles operationally significant. The following paragraphs will discuss the types, uses, and planning considerations of obstacles at the tactical and operational levels of war in more detail.

Obstacle Types

As mentioned above, obstacles include many naturally-occurring features such as rivers, steep slopes, deep ravines, and heavily forested regions. Other features such as urban areas, road embankments, and man-made ponds which exist on the battlefield may also serve as obstacles. In addition to these existing obstacles, reinforcing obstacles such as road craters, minefields, destroyed bridges, and tank ditches can significantly affect military actions. At the tactical level, individual obstacles similar to those described above can provide the tactical advantages that the commander seeks to gain through their use. Obstacles having operational significance are usually large-scale obstacles and quite frequently are composites of closely coordinated obstacles similar to those

mentioned above. Natural terrain features often provide the nucleus for the development of these operationally significant obstacles. Large, dense forest tracts, extensive marshes, steep-sided hill masses, and, to a lesser extent, rivers provide just the type of large-scale obstructions to movement that can constitute obstacles with operational significance. The incorporation of reinforcing obstacles like those described above can further enhance the blocking capacity of these natural features. Thus, at the tactical and operational levels, the types of obstacles are virtually identical with the scale of the obstruction providing the primary distinguishing feature.

Obstacle Uses

There are many uses for obstacles on the modern battlefield. At the tactical level, friendly troops use obstacles primarily to enhance the effectiveness of friendly weapons systems.¹ Well-placed obstacles do this in several ways. By delaying or even stopping advancing enemy formations, obstacles cause the enemy to remain exposed to the firepower effects of friendly weapons systems for longer periods of time than if the advance had been unimpeded. By canalizing the enemy or causing him to turn, obstacles force the enemy to move into zones where concentrated fires can destroy him. In addition to the use of obstacles to enhance the destruction of enemy forces, friendly units can use obstacles to delay the enemy's advance, to cover withdrawals, or to gain time to organize a coherent defense at another location. Also, military actions which place obstacles across the enemy's lines of communication, behind his forward units, can effectively reduce his ability to reinforce combat power at the FLOT and may facilitate his defeat in a piecemeal fashion. One final use for

obstacles at the tactical level is to enhance the defensibility of areas where the available forces are weakened because of the concentration of forces in other sectors.

At the operational level, obstacles have many of the same uses as they do at the tactical level. There is, however, a major shift in the emphasis of employment from the tactical level to the operational level. Whereas the most important use of obstacles having tactical significance is to enhance the effectiveness of friendly weapons systems, the primary use of obstacles having operational significance is the restriction of the maneuver options of the enemy or the creation of maneuver opportunities for the friendly commander. This means that the operational commander primarily uses obstacles to split enemy forces to facilitate piecemeal destruction, to gain a respite from military actions which permits the reorganization of forces or establishment of more advantageous positions, to economize forces in one sector while massing forces in another sector, or to place the enemy in a position such that he is vulnerable to attack through operational maneuver. With the exception of not using obstacles to enhance the fires of friendly weapons systems at the operational level, the uses of obstacle are identical at the tactical and operational levels of war.

Planning Considerations-Tactical

To achieve the maximum possible effect from an obstacle, the tactical military planner must be aware of certain planning considerations when selecting the site of the obstacle. First, and foremost, the obstacle planner at the tactical level must insure that the proposed obstacle supports the commander's scheme of maneuver and that the obstacle can be

integrated within that scheme of maneuver. If this consideration is satisfied, the planner can then consider other obstacle placement criteria. Since the primary function of most obstacles at the tactical level is to enhance friendly weapons' fire, obstacles must be positioned within the effective firing range of the covering weapons systems. Ideally, obstacle placement will be such that the friendly, covering weapons systems will have a decisive advantage such as range, concealment, or cover over the attacking forces. Secondly, for effectiveness, obstacles must be so situated that they are fully integrated with existing obstacles and that bypass is more difficult than the effort required to breach the obstacle. A key consideration in the employment of most obstacles intended to have tactical significance is the concealment of the obstacle from the enemy. By denying the enemy knowledge of the obstacle before he attacks into it, the friendly unit will reap the highest possible benefits from the obstacle's presence. The momentary confusion caused by the surprise discovery of the obstacle will allow friendly forces the time to engage the enemy successfully with the covering weapons systems. Additionally, the delay caused by the obstacle may be increased since the enemy may have to reposition forces to get the correct combination of breaching equipment and personnel to the obstacle location. These planning considerations which are so important for the correct use of obstacles at the tactical level of war are not necessarily the same for obstacle planning at the operational level of war. However, the overriding concept, that the obstacle plan is fully integrated with the maneuver plan, retains its paramount importance at the operational level.

Planning Considerations-Operational Level

The planning considerations for obstacles at the operational level of war are somewhat different from those described above. Because the large-scale obstacles that have operational significance are usually formed around an existing terrain feature, the commander has little flexibility in the positioning of the obstacle. However, the commander does have the flexibility to select which prominent terrain features will receive the engineer effort required to transform them into operationally-significant obstacles. Since the operational commander cannot reposition these obstacles on the battlefield to support his maneuver plan, he must insure that his maneuver plan accounts for the effects that they will have on his maneuver as well as that of his enemy. To a certain extent, these large, operationally-significant obstacles do more than just support the maneuver of friendly forces. Because of their size, they virtually dictate the maneuver options to both the friendly and enemy commanders.

Surprise is another planning consideration that has slightly different meaning for operationally-significant obstacles than it does for tactically-significant obstacles. Many tactically-significant obstacles derive increased effectiveness when their discovery is a surprise to the enemy. Because of the size and nature of operationally-significant obstacles, both combatants usually know of their existence and their location. In fact, the element of surprise usually appears not with the discovery of an operationally-significant obstacle but with the discovery that what one commander perceived to be an obstacle did not effectively obstruct his enemy. In such instances, the enemy may obtain a significant operational advantage over the surprised commander as several of the

examples in the following section will demonstrate. This implies that the operational significance of an obstacle area may depend not only on its physical obstruction capability but also on the way in which the opposing commanders perceive the obstacle. Therefore, a key planning consideration for the obstacle planner at the operational level is that he view the battlefield from the perspectives of both commanders, being very careful not to ascribe the capabilities of one army to the other. Tactical obstacle planners may also have to do this, but generally to a lesser extent since the physical obstruction of tactically-significant obstacles is much more important than the opposing commander's perceptions of the obstacle.

Summary

There are many types, uses, and planning considerations for obstacles at both the tactical and operational levels of war. Generally, the types and uses of obstacles are the same regardless of the level of war at which they are being used even though the scale of the obstacles may vary considerably. The operational planning considerations for obstacles are different from the tactical planning considerations. However, regardless of the level at which the obstacles are being planned, the obstacle planner must integrate his plan with the commander's scheme of maneuver if he is to obtain the full effects from his obstacles.

III. HISTORICAL EXAMPLES

The preceding discussion presupposed that obstacles could have operational significance. The best method to validate the supposition is to use examples of operationally-significant obstacles from previous wars. To this end, the following paragraphs will describe obstacles from the two world wars that had significance at the operational level of war. These examples should add clarity to the discussion presented above especially with regard to the types, uses, and planning considerations for operationally-significant obstacles. The examples will illustrate four types of operationally-significant obstacles:

1) Those which were, in fact, physical obstructions to the movement of military forces--Masurian Lakes, 1914; Siegfried Line, 1939; and Roer River, 1944;

2) Those which were not major physical obstructions to military maneuver but were perceived as such by the attacking forces--Siegfried Line, 1944;

3) Those which were perceived by the defending forces to be major obstacles but were not so perceived by the attacking forces--Ardennes Forest, 1940 and 1944; and

4) Those that were true obstructions, but that were not exploited for their full value by the defender--Maginot Line, 1940.

Also, these examples will provide some insight into the importance of operationally-significant obstacles for military operations. Section IV will discuss their importance in more detail.

Masurian Lakes, East Prussia, 1914

During the First World War, the German operational plan called for the rapid attack and defeat of France using the Schlieffen Plan while other German forces conducted an economy of force operation against the Russian Army in the East. Because of this plan, German forces in East Prussia faced a Russian force that enjoyed a numerical advantage of at least two to one.^a However, almost half of the invasion route from Russia into East Prussia was blocked by a nearly continuous string of lakes and very dense forests called the Masurian Lake region.^b The Germans had further reinforced the region with fortifications and defensive positions thereby making the area virtually impassable to large-sized units. As a result, the Russian force designated to attack East Prussia was split into two armies. The First commanded by Rennenkampf attacked north of the lake region and the Second commanded by Samsonov attacked south of the lake region. While the two armies were thus split by the lake region and not capable of supporting one another, the Germans were able successfully to mass their less numerous forces against one and then the other Russian army and inflict devastating defeats on them. The German attack against the First Russian Army actually depended on a critical flanking movement through a gap in the lake region which the Germans controlled with a small fortress.^c

Siegfried Line, Germany, 1939 and 1944

The Siegfried Line (West Wall) had operational significance at two different times in World War II even though it did not pose the same physical obstruction in both instances. First, in 1939, as the German Army was invading Poland, the Siegfried Line provided the basis for the

defensive effort against a possible attack by the French Army into the German homeland. At this time, the line represented a significant obstacle to any invasion attempt.⁵ Concrete gun emplacements provided the backbone of the Siegfried Line. The casemates provided adequate protection from the artillery available at the time. Extensive minefields, wire entanglements, and an integrated wire communications net increased the effectiveness of the positions. The German propaganda machine widely publicized the line as being an impregnable defensive belt. The French believed the propaganda and only launched a perfunctory attack against the Germans in September, 1939 as the German Army invaded Poland.⁶ The propaganda seemed to be somewhat prophetic because the attack failed drastically. As a result of the Siegfried Line in this instance, the German Army was able to mass a large portion of its available armed forces for the invasion of Poland while less numerous forces were able to secure Germany's western frontier.

When the fortunes of war had turned against the Germans and they were retreating into Germany in front of the Allied armies, the Siegfried Line once again exerted influence on the course of the operational campaign. However, the Siegfried Line of this period of the war was not the formidable obstacle that had existed in 1939. In August, 1944, as Allied armies approached the West Wall from the west, there was a noticeable pause in the pursuit of retreating German forces into the German homeland. Historically, the reason attributed to the pause was a lack of adequate supplies to continue the pursuit. The psychological image of the Siegfried Line as being virtually impenetrable also had a strong influence on the slowdown of operations. In Crusade in Europe, General Dwight D. Eisenhower expressed his feelings about the approach to the Siegfried Line:

"In September our armies were crowding up against the borders of Germany. Enemy defenses were naturally and artificially strong. Devers' U.S. Seventh and French First Armies were swinging in eastward against the Vosges Mountains, which formed a traditional defensive barrier. In the north the Siegfried Line, backed up by the Rhine River, comprised a defensive barrier system that only a well-supplied and determined force could hope to breach."⁷

This comment indicates that the pause for supply build-up was, to a certain extent, the result of the anticipation of future breaching operations against a very formidable Siegfried Line. In reality, in September, 1944, the Line had ceased to be an obstacle of any significance. The gun emplacements still existed, but for the most part they were empty. After the conquest of France, the German Army had removed the guns, mines, wire entanglements, and communications system from the West Wall defenses to build the Atlantic Wall. The opinions in OB West at the time were that the Allies could easily overrun the West Wall and advance to the Rhine River.⁸ However, the reputation of the wall helped to produce an operational slowdown in the Allied advance during which the Germans were able to regroup their shattered forces after the race across France. They also used the time to rehabilitate large sections of the Siegfried Line into a significant obstacle behind which they were able to assemble the forces for their winter offensive of 1944. Thus, in 1944 as in 1939, the Siegfried Line provided the Germans the opportunity to improve their operational fortunes even though it had lost nearly all its physical capacity to obstruct the movements of Allied forces.

Ardennes Forest, Belgium, 1940 and 1944

In the example of the Siegfried Line just discussed, the Allied armies perceived the existence of an operationally-significant obstacle in the form of the Siegfried Line and therefore adjusted their operational plan accordingly. They slowed their pursuit of the retreating Germans to build up their available supply base. The Ardennes Forest is another area to which the forces opposing the Germans gave operational significance as an obstacle in both 1940 and 1944 while the Germans did not perceive it as such. Both the French in 1940 and the Allies in 1944 were defending the Ardennes in an economy of force role while other, superior Allied forces were fighting the Germans in other sectors of the front. In both instances, the defenders believed that the rugged terrain and heavy forests of the Ardennes region would prevent the Germans from mounting a major attack through the region. German planners, on the other hand, were not deterred by the nature of the Ardennes' terrain. As a result, in 1940 and again in 1944, they were able to gain significant operational surprise by launching major offensives through the Ardennes region.

Maginot Line, France, 1940

The extensive network of fortifications erected by the French after the First World War, the Maginot Line, was an effective operational obstacle to the German invasion plans of 1940. Because of the Maginot Line, German planners had to envision an invasion plan of France that violated the neutrality of both Belgium and Holland. The French correctly anticipated the effect that the Maginot Line would have on the German invasion and planned to mass their forces to meet the attack through the low countries. When the attack came, French armies moved into Holland to

support the defending Dutch forces and to meet what they believed was the main thrust of the German attack. However, the French had perceived that the Ardennes Forest region was a natural extension to the obstruction caused by the Maginot Line. This misconception, as described above, allowed the Germans to achieve a penetration that eventually turned the largest concentrations of Allied forces and outflanked the Maginot Line. The Maginot Line had thus functioned well as an operational obstacle. It had clearly reduced the available maneuver options for the Germans and allowed the defending French to anticipate the most likely German attack route more correctly. The failure of the French defenses in 1940 was, therefore, not because of the failure of the Maginot Line to function as an operational obstacle. More correctly, the failure was because of the incorrect exploitation of the effects of an operational obstacle, in this case the Maginot Line, caused primarily by the mistaken identification of another operational obstacle, the Ardennes Forest.

Roer River, Germany, 1944

The Roer River is an excellent example of an operational obstacle that caused the changing of operational plans when the attacking forces encountered the obstacle. In the fall of 1944, as the Allies were pursuing the German Army into the German heartland, they had to cross the Roer River. In comparison to some of the other rivers that the Allies had crossed earlier in the war, the Roer River was not a major river obstacle. However, the river posed a different type of problem for the Allies. According to General Eisenhower:

"At the banks of the Roer, we met a new kind of tactical problem. Farther up the river, at Schmidt, were great dams. They were of special defensive value to the German because, by operation of the floodgates in the dams, he could vary the water level below them. This made an immediate assault across the Roer River impossible, since any troops successful in crossing could be isolated by a flooding of the river and thereafter eliminated by the employment of German reserves."*

The effect of this situation was obvious. Before the assault forces could cross the river, the dams located at Schmidt had to be captured from the Germans. Essentially, this was the change in the operational plans. As Allied forces waited on the banks of the Roer River, other units had to attack through the Huertgen Forest toward Schmidt. The operation to secure the dams took several weeks and in so doing delayed the advance into Germany significantly. Even though the Germans were not able to use the effectiveness of this operational obstacle to achieve a major operational advantage, they were able to secure a disruption of the Allied attack tempo and gain time with which to develop a more coordinated defense. Also during this time, the Germans were starting to mass the forces that would eventually be used in the winter offensive of 1944. Thus the exploitation of the Roer River and the dams at Schmidt as an operational obstacle provided the German defenders some increased operational flexibility even though it did not lead to operational victory.

IV. IMPORTANCE OF OPERATIONAL OBSTACLES

In some of the examples discussed above, the use of an operational obstacle by one of the combatants provided that combatant a distinct operational advantage over his adversary. In the other examples, the incorrect identification of an operational obstacle created severe difficulties for the successful implementation of the commander's operational plan. These examples clearly demonstrate the importance of operational obstacles. Because of their very nature, operational obstacles will shape the battlefield both in time and space. Temporally, operational obstacles will impose significant expenditures of time upon the commander who elects to breach or eliminate rather than bypassing them. This was very clearly the result when the Allies encountered the Roer River in 1944. Spatially, operational obstacles readily dictate where armies can move. Both the Maginot Line in 1940 and the Masurian Lakes region in 1914 restricted the areas through which the Germans and the Russians, respectively, could conduct their invasions. Operational obstacles can also affect the resource expenditures of an army. In addition to the loss of time that breaching of operational obstacles imposes, their breaching can require large expenditures of other resources such as men, equipment, and supplies. The Allies understood this point in the fall of 1944 as they approached the Siegfried Line. They slowed the pace of their operations to build up a sufficient supply base with which to breach what they perceived to be a significant obstacle.

Because of these effects of operational obstacles on the battlefield and on the resources of the conflicting armies, operational obstacles can provide the bulwark around which the commander's operational plan is based. The existence of an operational obstacle in a given sector of the battlefield may provide the commander with just enough operational advantage to gain an operational victory. The Germans were able to accomplish just such a victory over the Russians in 1914 because of the existence of the Masurian Lake region. In another instance, the existence of an operational obstacle in one sector of the front may enable the commander to mass forces sufficiently in another area to gain a rapid victory. Because of the Siegfried Line, the Germans, in 1939, were able to withdraw forces from their frontier with France to supplement the invasion forces for Poland. Finally, the existence of an operational obstacle to the rear of a retreating army can provide a means with which to gain the necessary time for force regrouping into a more coherent defense. Both the Roer River and the Siegfried Line provided such a respite for the German Army in 1944.

As important as operational obstacles are to the planning options of the commander, they are also important when trying to determine the possible actions of the opposing commander. If a commander can successfully identify the operational obstacles in his sector of the battlefield from his adversary's perspective (this is of paramount importance) he may be able to predict his enemy's operational plan with a great deal of accuracy. In so doing, the operational commander may thereby gain significant operational advantage over his enemy. In both attacks through the Ardennes Forest, the Germans used the French and then later,

the Allied perspective to identify the Ardennes Forest as an operational obstacle through which the German would not attack. Both times, the Germans had made the correct assessment and both times they were able to achieve operational surprise with their attack. This technique, however, is fraught with trouble if the commander does not correctly assimilate his opponent's perspective or assumes that the significance of the obstacle is the same for the enemy that it is for him. In 1940, the French very correctly identified the obstacle significance of the Maginot Line but then attributed too much effectiveness to the Ardennes Forest. The result of this error was operational surprise by the Germans and the ultimate defeat of the French and British forces in France. From a defender's point of view, the correct identification of operational obstacles from the enemy's perspective may give the commander the insight to position his reserves for the most significant impact on the battle. For more proactive responses, the correct delineation of operational obstacles may help the commander to identify counterattack opportunities, both in time and location. Thus, the importance of operational obstacles comes not only from their physical effects on the battlefield but also from their perceived effects taken from the perspectives of both commanders.

V. PLANNING PROCEDURES

The correct application of operational obstacles in a country's warfighting doctrine depends, to a great degree, upon the country's obstacle planning procedures. Currently, the obstacle planning procedures of the United States Army do not adequately consider the possibilities for operational obstacles and, therefore, are deficient. The next few paragraphs will describe the planning procedures that will allow commanders to incorporate operational obstacles effectively into their operational plans. Thereafter, several additional paragraphs will discuss the current planning procedures of the U. S. Army. The next section will then discuss those areas in which current planning procedures are deficient and what changes need to be made to better facilitate the use of operational obstacles.

Proposed Planning Procedures

The planning procedure for the use of operational obstacles begins with the commander's first assessment of the battlefield upon which he is to fight. During that initial look at the battlefield, the commander must study the terrain carefully to determine if any operational obstacles exist naturally or if portions of the battlefield are suitable for use as operational obstacles if supplemented with appropriate engineer effort. An important aspect of this initial study of the battlefield is that the commander view the ground not only from his perspective but also from that of his opponent. His study must take into account his opponent's ability to cross difficult terrain and his willingness to do so. The commander must be very careful not to translate his army's capabilities to the enemy.

The Germans, in 1941, believed the numerous marshes on the Eastern Front to represent virtually impassable barriers to armored forces but the Russians continually crossed them because they were willing to accept the manpower and equipment losses incurred during the crossing process.¹⁰ Because of the disparities which may exist between the abilities and willingness of the two opposing armies, the operational obstacles that are identified during the initial study may not be the same for both combatants. However, it is important to identify the obstacles from both perspectives to establish with some degree of certainty what options are available to the friendly commander as well as to the enemy commander.

Once the commander has determined what operational obstacles exist within his portion of the battlefield both for himself and for his adversary, he must begin to formulate his operational war plan. During this plan formulation, the commander should try to maximize the effectiveness of the operational obstacles commensurate with his overall operational goals. He can try to determine what actions his opponent will take when he encounters the obstacles to identify opportunities for decisive action. The plan should clearly delineate those areas which the commander believes to be operational obstacles and should demonstrate how the obstacles will affect the course of the operational campaign. Once the plan is completed and is passed to the subordinate tactical commanders, they can develop their own tactical maneuver plans and the obstacle plans to support them. By referring to the operational plan, the tactical commanders can determine how the proposed and existing operational obstacles will affect their maneuver plans, what conditions the operational obstacles will impose on the tactical battle, and how best to employ

tactical obstacles to support their battle plans and fighting positions. The end result of such a process is an operational maneuver plan that incorporates the effects of operational obstacles and is supplemented by carefully integrated maneuver and obstacle plans at the tactical level.

Just as important as the delineation of operational obstacles in the planning phase of the operation is the identification of zones which must remain free of obstacles to facilitate friendly maneuver. Such maneuver zones are usually necessary to exploit the advantages gained from enemy reactions to operational obstacles. An example of such a zone is the corridor in the Masurian Lake region through which the Germans attacked as they defeated the Russian First Army. The Germans had denied Russian access to the corridor with a small fortress that did not obstruct their own movements. Had they employed numerous terrain-reinforcing obstacles in the corridor, instead of relying on the fortress, their use of the corridor would have been limited. Similarly, the inopportune placement of tactical obstacles in a zone through which the operational commander desires to conduct some type of friendly maneuver during the battle can decrease the effectiveness of his maneuver and possibly lead to operational defeat. The operational plan must also show these obstacle free zones so that subordinate commanders can plan their own battles accordingly.

In summary, the best procedures for obstacles planning start with the operational commander. He must study the ground upon which he will meet the enemy from both his and his opponent's perspectives. After studying the ground, he must identify the operational obstacles in the sector and then develop his operational plan, complete with the location of obstacle free zones, to maximize the advantages which the operational obstacles give

to him. When the completed plan is passed to the tactical commanders, they plan their own parts of the battle and then develop their obstacle plans to support their maneuver. The key feature of these procedures is that the entire planning process is a top-down sequence with obstacle planning and maneuver planning being integrated at each level before the battle plan is passed to the next lower level of command.

Current Planning Procedures

Current obstacle planning procedures do not feature a top-down approach similar to the one articulated above. On the contrary, current doctrinal literature indicates that obstacle planning is a function that is completed at the tactical level. For example, FM 100-5, Operations, does not mention obstacle planning as one of the preparations for combat that the defender must perform at the operational level. It does, however, consider obstacle planning as an ingredient in the tactical preparation of the battlefield.¹¹ Additionally, the obstacle planning process detailed in FM 5-102, Countermobility, lists nine steps in the planning process:

1. Analyze the mission.
2. Analyze avenues of approach.
3. Analyze engagement areas, battle positions, and locations of weapons systems.
4. Determine possible obstacle locations and types.
5. Determine the commander's obstacle priorities.
6. Determine resources.
7. Determine actual work sequence.
8. Determine task organization required.
9. Determine coordination required.¹²

The emphasis of these nine planning steps is clearly on the tactical level of obstacle planning where the enhancement of weapons effects is the key consideration for obstacle employment.

Under current obstacle planning procedures, a Corps obstacle plan undergoes the following sequence of development.¹³ First, the corps commander develops his operations plan which he passes down to his subordinate commanders. They, in turn, create battle plans to support the operations plan and pass them to their subordinates. This passing of the maneuver plan to successively lower levels of command continues until the plan reaches the brigade level. There, the engineer staff officer first starts the obstacle planning process to support the maneuver plan. Following the steps listed above, the engineer staff officer, in conjunction with the Brigade S-3 and the subordinate battalion commanders, will develop an obstacle plan to support the Brigade's maneuver plan. He then forwards the plan to the next higher headquarters where it is consolidated with other Brigade plans to get a composite plan for the higher headquarters. The compilation process continues until the composite plans reach the operational headquarters and the overall obstacle plan is compiled. Throughout the process, the key restraints on obstacle employment are resource oriented as shown by steps five through eight above. The net effect of these procedures is a planning sequence that features top-down maneuver planning and bottom-up obstacle planning.

VI. ANALYSIS

There are several differences between current obstacle planning procedures and those proposed earlier. The primary difference between the two sets of procedures is the planning sequence. As stated above, the current planning sequence for obstacle planning is bottom-up, while for maneuver planning, it is top-down. There can be little integration of the two plans, maneuver and obstacle, at the operational level with the planning being started at opposite ends of the command hierarchy. With the U. S. Army's prior emphasis on fighting the tactical battle, this disconnect was not severe since at the tactical level there was very close integration between the maneuver plan and the supporting obstacle plan. The correct practice of the operational art of war requires a more coordinated development of obstacle and maneuver plans at all levels. The best way to achieve this coordination is with the proposed procedures, that is, with both a top-down maneuver planning sequence and a top-down obstacle planning sequence. Such a sequence will facilitate the complete integration of obstacle and maneuver planning at all levels of command and will greatly decrease the possibilities of tactically-applied obstacles interfering with operationally-designed maneuvers. As operational commanders become more adept at the practice of the operational art of war, they are going to be more concerned with how the battlefield will affect their operational maneuvers and they will want to control the modification of the battlefield so that they can gain the greatest operational advantage possible. To this end, the identification of operational obstacles and the delineation of obstacle free zones will satisfy their desires.

The second key difference between the two planning procedures is in the recognition of operational obstacles and the analysis of the battlefield from the enemy's perspective. When obstacle planning takes place at the tactical level and then is simply compiled at higher levels, the recognition of obstacles that may have operational impact is difficult. An obstacle planner at the brigade level cannot fully comprehend the impact that a terrain feature or a series of large, reinforcing obstacles might have on a much larger unit. The scope of the war for the planner is too small. Rather than trying to visualize the impact of an obstacle on a division, corps, or army, the low level obstacle planner tends to visualize the impact of the obstacle on a single tank or a tank company. In most instances the two are not the same. The concept of the operational level of war has the implication of military actions of a certain size so the planning of operational obstacles must be done by planners who have an appropriately sized perspective. Similarly, the obstacle planner must have an understanding of the enemy's perspective on the battlefield if he is to plan obstacles that are to have operational impact. The planner must be able to interpret the battlefield in the same manner as the enemy operational commander if he is to devise obstacles that will alter the way in which that commander views and uses the battlefield. Typically, the obstacle planner at the tactical level is not able to reach that level of understanding of the enemy.

A final difference between current practice and the proposed change to the consideration of operational obstacles is not so much a procedural difference as it is a difference in the thought processes concerning obstacles. Under the current system of obstacle planning and employment,

an area characterized by very rough terrain, dense forests, or some combination of the two, generally becomes an area where the friendly force commander can use an economy of force measure to facilitate the greater massing of forces in another sector such as was the case with the Ardennes Forest in 1940 and 1944. Generally, the economy of force applies to an economy of engineer effort for the area as well. Thus, very restrictive terrain receives few, if any reinforcing obstacles which could greatly increase its obstructing capability. With identification of such an area as an operational obstacle, however, the operational commander can insure that adequate engineer resources get committed to the reinforcement of the terrain to insure its viability as an operational obstacle. By taking such actions the operational commander can secure the anchors around which he conducts operational maneuver.

VII. CONCLUSION

As the United States Army continues to improve its understanding of war at the operational level, it will redefine some of the major aspects of its warfighting doctrine to incorporate the correct operational perspective. As an important area of warfighting doctrine, obstacle planning and utilization requires some immediate modifications to facilitate the correct application of the operational art of war. The problem is that current doctrine and procedures do not discuss operationally-significant obstacles or facilitate the correct integration of such obstacles into the operational scheme of maneuver. However, as this paper has shown, there are such things as operationally-significant obstacles which can affect operational plans. Such obstacles were important in both of the world wars, as the examples illustrate. Armies were able to use operational obstacles or their opponents' perception of operational obstacles to gain operational advantages which very often led to major operational victories. On the other hand, the mistaken identification of operational obstacles severely jeopardized the defense built around the ill conceived obstacles. Whichever the case, operational obstacles had a significant influence in both world wars, and most likely will continue to exert a strong influence in future wars. Thus, current obstacle doctrine must accept the existence of operationally-significant obstacles.

In addition to the acceptance of operational obstacles as part of its warfighting doctrine, the U. S. Army must develop new obstacle planning procedures that more correctly fulfill the needs of the operational

commander. The present system of top-down maneuver planning and bottom-up obstacle planning is totally inadequate for the proper integration of the maneuver and obstacle plans at both the tactical and operational levels of war. At best, the present system allows for close integration between the tactical commander's maneuver plan with his supporting obstacle plan. It does not allow for such things as operational obstacles or the reservation of obstacle free areas through which the operational commander can plan his own maneuvers. This paper has proposed the development of a top-down obstacle planning procedure that seems to present the best solution to the inadequate planning procedures. Since the obstacle plan would accompany the maneuver plan as it passed from the operational commander to the tactical commanders, the complete integration of both plans at all levels should be possible. Additionally, the operational commander will retain the capability to identify operational obstacles in his zone of operations which will significantly affect either his or his opponent's available options for military action. The top-down planning procedure will permit the operational commander to identify the location of operational obstacles and obstacle free zones for his subordinate commanders so that he can retain the flexibility to exploit the operational obstacles to secure the greatest operational advantage possible.

ENDNOTES

1. U. S. Army, Field Manual 90-7, Obstacles (Interim Draft), (June, 1979), p. 3-4.
2. Hermann von Francois, Tannenberg, The Cannae of The World War (Berlin: Verlag Deutscher Jagerbund, 1926), p.2.
3. C. R. M. F. Cruttwell, A History of the Great War (London: Oxford University Press, 1934), p. 41.
4. Ibid., p. 47.
5. Generallieutenant zV Bodo Zimmermann, OB West, Atlantic Wall to Siegfried Line, A Study in Command, European Command, Historical Division, 1946, pp. 181-182.
6. R. K. Siskind, Analysis of Historical Barriers: The Siegfried Line (Marina Del Rey, CA: R&D Associates, 1977), p. 1-2.
7. Dwight D. Eisenhower, Crusade in Europe (Garden City, N.Y.: Doubleday and Company Inc, 1948), p. 322.
8. Zimmermann, op. cit., p. 180.
9. Eisenhower, op. cit., p. 329.
10. Guenther Blumentritt, The Strategical Untenability of Fortified "Lines", U. S. Army, Europe, Historical Division, 1947, p. 18.
11. U. S. Army, Field Manual 100-5, Operations, (May 1986), p. 132.
12. U. S. Army, Field Manual 5-102, Countermobility, (March 1985), p. 56.
13. U. S. Army, Field Manual 100-5, Operations, (May 1986), p. 10. This reference establishes that "no particular echelon of command is solely or uniquely concerned with the operational art." The paper uses the corps level of command in its discussion of obstacle planning procedures because it is the corps level of command that is normally, but incorrectly, associated with the operational level of war.

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