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**The Shortest Way Home:
Risk and the Airland Battle**

**A Monograph
by
Major James K. Greer
Armor**

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**School of Advanced Military Studies
United States Army Command and General Staff College
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MONOGRAPH APPROVAL

Major James K. Greer

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AirLand Battle

Approved by:

Lowell L. Day Monograph Director
Lieutenant Colonel Lowell L. Day, M.ED

William H. Janes Director, School of
Colonel William H. Janes, MA, MMAS Advanced Military
Studies

Philip J. Brookes Director, Graduate
Philip J. Brookes, Ph.D. Degree Program

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Abstract

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I. INTRODUCTION

On 31 August 1944, the wild and glorious advance of Patton's Third Army across France came to a halt. On that day, the Third Army recieved no gasoline at all, and logistical considerations forced Patton to discontinue the attack. It took the Third Army five days to build up sufficient stocks of gasoline to begin the advance once more. However, during that period, the German Army was able to establish at least hasty defensive positions along the Moselle River, the next natural obstacle barring Patton's way.

To resume the attack, the XII Corps, under command of Major General Manton S. Eddy, attempted a crossing of the Moselle at Pont-a-Mousson on 5 September. The 80th Infantry Division, as the Corps main effort, attempted a crossing, but was thoroughly repulsed by the 3d Panzer Grenadier Division. XII Corps spent the next week regrouping and preparing for crossings both north of Nancy at Dieulouard and south of Nancy.

On 12 September, the assault crossing by the 80th Division, north of Nancy, started off well. The 80th established a bridgehead and quickly emplaced three bridges. By nightfall, the bridgehead included a strong force of two infantry battalions, two medium tank companies, an artillery battalion, and the engineers supporting the crossing. Combat Command A (CCA), 4th Armored Division (4AD)

was preparing to cross the river and begin exploiting east. However, shortly after dark, the 3d Panzer Grenadier Division counterattacked in strength. Heavy German artillery concentrations fell on the bridgehead area, while infantry battalions supported by assault guns attacked the bridgehead from the north, east, and south. By 0700 on 13 September, the 3d Panzer Grenadier Division had reduced the bridgehead considerably and was threatening to take the easternmost of the three bridges. The only CCA, 4AD element to cross was Troop D of the division's reconnaissance squadron. It had advanced into the bridgehead and been stopped by strong assault gun fire.¹

The situation at the bridgehead was critical. The CCA commander and the 37th Tank Battalion commander met the division commander of the 80th Infantry Division near the bridge site before 0700. There was considerable doubt in the minds of some present as to whether or not it was possible for the combat command to cross in the face of the German counterattack. In fact, the corps control officer at the bridge had refused to allow the armor to cross up to this time. Both of the armor commanders urged immediate crossing. The discussion had reached an impasse when Major General Eddy and Major General John S. Wood, the 4th Armored Division Commander, arrived at the scene. General Eddy took stock of the situation, and then the following conversation occurred.

General Eddy to Colonel Clarke, "Do you think you can

make it?"

"Yes General, I think it is the only thing to do, we can't fight the Germans on this side of the river."

General Eddy, "Well, I will leave it up to you. If you think you can get through I'll let you go. If you think you can't make it, no blame will be attached to you."

Colonel Clarke turned to LTC Crieghton Abrams, 37th Tank Battalion Commander, and asked, "What do you think?"

LTC Abrams pointed across the river and replied, "Colonel, that is the shortest way home!"

Colonel Clarke ordered, "Get Going." and Abram's tanks led the way across the Moselle at 0800 on 13 September.²

At the time, and in retrospect, the above decision was extremely risky. The Germans had previously demonstrated they were determined and capable of defending the Moselle. The commanders present knew that there were elements of three German divisions in their zone defending the Moselle. The counterattack in progress had not been stopped and there was a good chance that CCA could be defeated while or after crossing the river. Additionally, three factors served to increase the difficulty and risk of making the decision. First, the situation was unclear, particularly regarding the status of the defense of the bridgehead and the future intentions and capabilities of the Germans. Second, a river crossing against a counterattacking enemy with portions of two friendly divisions intermixed is a difficult operation to control. American mistakes could

unhinge the operation as easily as German successes. Finally, the decision was made under the pressure of little time. Hesitation to allow the situation to clear could give the Germans the opportunity to seize the bridges. Launching too early could place CCA, 4AD in a vulnerable position if a stronger German counterattack were to hit the bridgehead just as the crossing was in progress. When Colonel Clarke, prompted by the advice of LTC Abrams, made his decision, he was definitely taking a risk.

The situation outlined above details an example of risk-taking on a mid-to-high intensity, non-linear, battlefield; when the enemy and friendly situation was unclear. In short, the type of situation envisioned in our current AirLand Battle Doctrine. Even more importantly, this was an example of seizing the initiative as required by the U.S. Army's current doctrine:

AirLand Battle is based on securing or retaining the initiative and exercising it aggressively to accomplish the mission. The object of all operations is to impose our will on the enemy - to achieve our purposes. To do this we must throw the enemy off balance with a powerful blow from an unexpected direction, follow up rapidly to prevent his recovery and continue operations aggressively to achieve the higher commander's goals.³

The quotation above is the statement of U.S. Army AirLand Battle Doctrine contained in the 1986 version of FM 100-5, Operations. The key sentence is the lead-off one. AirLand Battle Doctrine requires that we gain and exploit the initiative. Only through retention of the initiative

can we assure success. FM 100-5 goes on to state that success on the battlefield will depend on the Army fighting in accordance with four tenets: initiative, agility, depth, and synchronization.

The first tenet is initiative. Initiative means setting or changing the terms of battle by action. Concerning initiative FM 100-5 specifically states:

Initiative requires audacity which may involve risk-taking and an atmosphere that supports it. There are at least two kinds of risk in combat. One is the risk of losing men and equipment to attain the mission. The other is that the chosen course of action may not be successful, or even if successful, fail to achieve the desired effect. All leaders must take prudent risks of both types independently, based on their own judgement.⁴

This quotation serves at least two purposes. First, it ties the concept of risk to AirLand Battle Doctrine. It accomplishes that purpose by linking risk-taking to seizing the initiative. This does not imply that taking risk is the only means of securing the initiative, only that it is an important means. The second purpose this quotation accomplishes is to produce three requirements for the Army in order to employ the risk-taking aspects of AirLand Battle Doctrine. These requirements for the Army are: produce leaders at all levels who take risks; produce an atmosphere (command climate?) that supports risk-taking; and produce a method to assure the risks taken are prudent, i.e., based on good judgement.

The purpose of this monograph is to examine the Army's current written doctrine and determine if it is adequate to

the purposes outlined above. It is, of course, not possible to state definitively whether a doctrine adequately addresses a particular subject. So, this examination will reinforce those portions of the doctrine where risk-taking appears adequately addressed. It will highlight areas where the doctrine appears insufficient to the stated purposes and suggest improvements for incorporation in the appropriate manuals.

The Army considers risk in a number of areas, to include: nuclear employment, deterrence, force modernization, and battlefield risk. This paper will focus on battlefield risk at the tactical level.

The methodology employed in this monograph will be to start with a case study illustrating consistent risk taking at tactical levels. The 4th Armored Division in World War Two will be the object of the case study. Next, the monograph will develop the theory of risk, then examine current written doctrine concerning risk for the following manuals: FM 100-5, Operations; FM 101-5, Staff Organization and Operations; ST 100-9, The Command Estimate; and FM 22-103, Leadership and Command at Senior Levels. The selection of FM 22-103 does not imply that risk taking leadership is not needed at all levels. Instead, it was selected to emphasize the role senior leaders play in development of command climate. Finally, the monograph will offer suggestions for further development of risk-taking in the next generation of written doctrine.

II. The 4th ARMORED DIVISION - AN ILLUSTRATION OF RISK

The following case study illustrating risk features the 4th Armored Division in World War II. The 4th was selected for several reasons. The primary reason is that leaders in the 4th habitually took risks at all levels. A second reason is that the Division Commander, Major General John S. Wood, established an environment that supported risk taking. A third reason is that the battle conditions in which the 4th operated were similar to those the U.S. Army expects to fight in in the future; non-linear, mid-to-high intensity, extensive depth, outnumbered, and over extended periods of time without let-up. Finally, the deployment and introduction to combat of the 4th is similar in some respects to a reinforcing division being deployed to Europe after hostilities have commenced.

The 4th was activated on 15 April 1941 at Pine Camp, New York. During the period June to August 1941, the 4th conducted basic training and was brought up to full strength. From September 1941 to April 1942, the 4th conducted small unit training and reorganized to reflect the flexible combat command organization of the light armored division. In June of 1942, MG Wood took command of the division.⁵

John S. Wood became the primary influence on the manner in which the 4th operated. An extremely intelligent man, he had spent the interwar years studying Liddell Hart, J.F.C. Fuller, and Charles De Gaulle. He became convinced

that the next war would be characterized by maneuver, mobility, and the indirect approach. The other key quality that Wood brought to the 4th was absolute loyalty to his soldiers. The bond between leader and unit that resulted from Wood's loyalty, warmth, and concern led to the highest standards in readiness and esprit.⁶

In September of 1942, the 4th deployed to Tennessee for three months of division level maneuvers. During these maneuvers, the 4th began to demonstrate the fast-paced, risk taking style of warfare that Wood advocated. Following the Tennessee maneuvers, the 4th deployed to the California desert for six more months of mounted training. In June of 1943, the 4th moved to Camp Bowie, Texas for division level training. There, the lack of terrain features forced the division to be innovative in its approach to solving tactical problems.⁷ On 29 December, 1943 the division sailed for England.⁸

In England, the 4th was billeted in three different areas, by combat command. This arrangement included training, which served to reinforce Wood's belief in decision making at the lowest practical level and trust of subordinate leaders. The experience the combat command commanders gained in operating independently would be of value during actual combat. On 1 February, 1944 the 4th was assigned to the 3d Army under Patton. Patton's influence is demonstrated in Wood's writings, particularly his emphasis on audacity.⁹ For the next four months, the division trained

hard, primarily at the combat command level.

On 11 July 1944, the 4th went ashore on Utah Beach. Assigned to VIII Corps, the 4th occupied a portion of the lines in a quiet sector from 18 -26 July. This allowed the soldiers and leaders to accustom themselves to combat operations prior to their first big test.

On 27 July, the 4th conducted a breakout as part of VIII Corps in OPERATION COBRA. Following the breakout, the division transitioned immediately to exploitation. It was their first exposure to independent operations. Beyond the breakout point the situation was unclear, but the German Army was known to have substantial Panzer reserves available. Although Allied airpower dominated the skies, it was not a foregone conclusion that COBRA would be successful. This was particularly true since the Germans had defeated the previous breakout attempt, OPERATION GOODWOOD.

Despite inexperience and the unknown situation, the 4th began to take risks. Wood advanced with two separate, combined arms columns, on narrow fronts, at the maximum speed possible. Bypassing combat troops, the 4th penetrated to the rear of defending divisions and cut the enemy's supply lines. The risk paid off. On 1 August, driving into Brittany, the 4th advanced 54 miles. On 3 August, Wood took another risk, separating his combat commands out of mutually supporting distance in order to encircle the city of Rennes. With escape, supply, and communication routes cut, the city surrendered without attempting to defend, despite

outnumbering the attackers and occupying strong positions. On 4 August, still another risk, this time in the form of downloading all supply trucks in order to motorize infantry elements attached from the 8th Infantry Division. The risks continued to be successful, as on 5 August the 4th advanced 70 miles.

Now the 4th turned east and started the great drive across France. The next risk was continuing the attack even though supply installations were now at least 100 miles to the rear. On 24 August Combat Command A (CCA) took risk by attacking the city of Troyes even though the defending garrison outnumbered CCA by more than two to one. On 29 August, the risks continued as CCB attacked Commercy with light tanks against German 88mm guns in a driving rain-storm. Throughout the drive across France, the 4th took logistics risks by having combat service support (CSS) elements follow, without protection, in the "vacuum" behind advancing columns.¹⁰

The initial risk situation in the Nancy Bridgehead has already been covered. However, the Lorraine Campaign is an excellent example where the 4th took risks at every level from tank commander through division commander. Tank commanders took risk by always traveling unbuttoned. Although they risked their lives, they were able to see, providing them information earlier with which to make decisions.¹¹ It also made command and control easier, resulting in more dependable actions in response to

commands. At the troop level, Captain Trover, commanding the reconnaissance troop of CCA, advanced unsupported across the bridge at Dieulouard to attempt to drive back the German counterattacks of 12 September.¹² At the combat command level, the CCA Commander, Colonel Clarke requested permission to drive toward Saarburg, Germany, but the request was denied by the more conservative Corps Commander Eddy. Finally, at the division level, Wood split the combat command to the north and south of Nancy in order to encircle the city. When the division was reunited at Arracourt, the 4th operated for four days 30 kilometers in the enemy rear against elements of three divisions. During that period, risk was again taken logistically, as the combat service support elements moved at night through enemy-held territory in order to resupply the division.¹³

There can be no doubt that the 4th consistently took risks at multiple levels of command throughout the drive across France. There also can be no doubt that the risks were rewarded by immense success. From 26 July to 31 August, 1944 the 4th Armored Division advanced 1025 miles; farther and faster than any other divisional-sized unit in U.S. Army history. The 4th captured over 11,000 prisoners of war and killed or wounded approximately 5,000 enemy soldiers. During the same period, the 4th lost 262 killed, 803 wounded, and 59 missing in action. The 4th destroyed or captured 17 tanks, 59 large artillery pieces, and 659 miscellaneous vehicles. In contrast, the division lost 30 tanks, 4

artillery pieces, and 157 other vehicles.¹⁴ While the success of the 4th should not be attributed entirely to risk taking, there can be no doubt the magnitude of the success was largely due to the fast paced, risk taking style of warfare practiced by the division. The style of the 4th can be summed up by a quotation from Lieutenant Colonel Creighton Abrams, Commanding the 37th Tank Battalion:

"Mobility is our reserve; momentum leads to victory; the quickest way home is east. Attack! Attack Attack!"¹⁵

III. RISK-TAKING THEORY

A. RISK CHARACTERISTICS

The best place to start in developing a theory of risk is with it's definition. Unfortunately JCS Pub. 1, Dictionary of Military and Associated Terms, does not define risk in tactical terms. Instead, risk is only defined in terms of the degree of risk associated with employment of nuclear weapons. Such use is not appropriate for this paper.

The American Heritage Dictionary contains several definitions of risk. When used as a noun, risk is defined as; the possibility of suffering harm or loss. It is also defined as; a factor, element, or course involving uncertain danger. When used as a verb, risk is defined as; to expose to a chance of loss or damage. In these three definitions, the words chance, possibility, and uncertain are the operative terms. In risky situations, the outcome is not clear or totally predictable. The definitions also

yield the unpleasant fact that risky situations are accompanied by a potential for damage, harm, or loss. Still, the fact that the loss is only potential means that the outcome of a risky situation can be positive.

Having defined what risk is, it is important to determine what risk is not. A sure loss is not a risk. Nor is a commander taking risk merely because he is presented with a superior force to defeat. The nineteenth century military theorist Carl von Clausewitz addressed fighting outnumbered when he wrote:

A distinction should be made among acts of boldness that result from sheer necessity. Necessity comes in varying degrees. If it is pressing, a man in pursuit of his aim may be driven to incur one set of risks in order to avoid others just as serious. In that event one can admire only his powers of resolution... The young man who leaps across a deep chasm to show off his horsemanship displays boldness; if he takes the same leap to escape a band of savage janissaries all he shows is resolution.¹⁶

Therefore, it is not a risk if one has no choice.

There is one more risk-related term that requires definition; a gamble. Often in the U.S. Army the term gamble is interpreted as a uncontrolled risk or a risk with little hope of succeeding. For example, in an August 1980 Military Review article, LTC Igor Gerhardt says:

One important point to highlight early is that a risk should not be confused with a gamble. A gamble is a toss of the dice - win or lose. It represents a life-or-death situation. If a military gamble fails it may result in disaster.¹⁷

However, this common use of the term gamble is not supported by the definition in The American Heritage

in terms of the domains of battle as identified by Clausewitz. "Magnitude of loss," "chance of loss," and "exposure to loss" can be considered to lie, respectively, in the physical, mental, and moral domains of battle.

The risk component "magnitude of loss" lies in the physical domain of battle. Loss is something that can be measured. It can be expressed in terms of units destroyed, soldiers killed, terrain surrendered, or objectives denied. Consequently, the commander has some control over the "magnitude of loss." If he sends a squad-sized patrol behind enemy lines, he only risks losing a squad. The same is true if a battalion is placed in an economy of force role. Also, when examining the concept of "magnitude of loss," we find that loss can be expressed in both a positive and negative manner. The positive loss is one where the result of taking a risk is not as good as some other outcome, but better than the previous status quo. For example, CCA could have succeeded in the river crossing, yet taken heavy losses. While not as positive as a successful crossing with few losses, this outcome would be better than defeat without crossing the river. The negative loss is when the result of taking a risk is worse than the status quo, i.e., defeat without crossing the river and with heavy losses. Every risk situation has the potential for both forms of loss.¹⁹

The component, "chance of loss" is tied to the concept of probabilities. Chance is not subject to finite

measurement as is magnitude. However, chance can be expressed in terms of probabilities, which, if not discreetly measurable, at least lends itself to prediction. Clausewitz says:

Many intelligence reports in war are contradictory; even more are false, and most are uncertain. What one can reasonably expect of an officer is that he should possess a standard of judgement, which he can gain only from knowledge of men and affairs and from common sense. He should be guided by the laws of probability.²⁰

Thus, when commanders and staffs make an estimate of the situation or compare alternate courses of action, they must consider the probability or chance that the opponent will perform in a certain manner, or that a deception effort will work. The probability they assign represents the "chance of loss" in a risk situation. Therefore, the component "chance of loss" lies in the mental or cybernetic domain of battle.

The first component of risk, "magnitude of loss," measures what is to be placed at risk, and potentially lost. The second component, "chance of loss," assigns a probability of the loss occurring if the risk is taken. The last component, "exposure to loss," requires a decision. The commander must decide if the risk is to be taken. The commander makes this decision in an environment of uncertainty, danger, and possible grave consequences to his unit and his nation. Therefore, it takes moral courage and determination to make a decision in a risk situation.

Clausewitz addresses the moral aspect of command when he says:

Intelligence alone is not courage; we often see that most intelligent people are irresolute. Since, in the rush of events, a man is governed by feelings rather than by thought, the intellect needs to arouse the quality of courage, which then supports it and sustains it in action.²¹

Thus, the ability to make the risk decision lies not in the physical or mental realm, but in the moral domain of battle.

Having addressed the components of risk, it is necessary to examine what causes a situation to be risky; the risk determinants. If the outcome of a situation or battle were certain, then there would be no risk. However, in war nothing is certain. There can never be a situation in which the commander has total control over events; in which he has totally complete and correct information; or in which he has sufficient time to make a perfect estimate and select the one best course of action. So, the commander is continually faced with situations in which lack of control, lack of information, and lack of time determine the extent of risk in the situation. Therefore, the more useable control, information, or time the commander has, the less risk the situation contains. Next, it is important to examine each of the determinants of risk in more detail.

The first determinant is "lack of control." Commanders lack control over situations for a variety of reasons. There are purely uncontrollable events such as weather or availability of natural resources. There are also actions

conducted by persons over whom the commander has no control, such as the enemy.²² Finally, there are the myriad of control problems which surface when the commander attempts to have his unit accomplish some action. Clausewitz calls the sum of these control problems friction:

Countless minor incidents- the kind you can never really foresee- combine to lower the general level of performance, so that one always falls far short of the intended goal.²³

Thus, the determinate "lack of control" corresponds closely to the Clausewitzian concept of friction. This friction serves to increase the risk of any operation as it reduces the control that the commander has over events and increases his uncertainty over the outcome of those events he sets in motion.

Just as friction induces uncertainty into the risk situation, a lack of perfect information impacts on the commander's ability to make the best decision. In war, the commander never has all the information he would like to have to make a decision. Our intelligence about the enemy is often wrong, incomplete, or late. Clausewitz states:

The general unreliability of all information presents a special problem in war: all action takes place in a kind of twilight, which, like fog or moonlight, often tends to make things seem grotesque and larger than they really are. Whatever is hidden from full view in this feeble light has to be guessed at by talent, or simply left to chance.²⁴

Thus, the determinant "lack of information" corresponds closely to the Clausewitzian concept of the fog of war. This fog serves to increase the risk in any operation, as

it lowers the value of the information with which the commander must make a decision.

Time serves as a catalyst for the determinants of friction and fog. Just as in the old saying, "haste makes waste," the compression of time available serves to magnify the impact of friction. A decrease in time available for planning and wargaming means more unforeseen actions (both friendly and enemy). Limited execution time can result in a lack of preparation or vital tasks left uncompleted. The impact of a decrease in time available to gather and process information means the commander must make the risk decision with even fewer intelligence products. Limited time degrades the commander's ability to see the battlefield. Thus, time, as the third determinant of risk, serves to accelerate the impact of fog and friction.

To fully describe the components and determinants of a risk situation, it is important to establish the relationship between these two concepts. This relationship is expressed in Table 1 in terms of the effect on the decision maker.²⁵

Having addressed the components and determinants of risk, it is important to consider the possible outcomes of risk decisions. When confronted with the situation at the Dieulouard Bridgehead, Colonel Clarke had to decide whether or not to cross the river. If he chose not to cross the river, the German forces probably would have pushed back those American forces already across the river and

RELATIONSHIP BETWEEN COMPONENTS AND DETERMINANTS OF RISK

DETERMINANTS OF RISK	COMPONENTS OF RISK		
	MAGNITUDE OF LOSS (PHYSICAL)	CHANCES OF LOSS (MENTAL)	EXPOSURE TO LOSS (MORAL)
LACK OF CONTROL (FRICTION)	Cannot affect size of loss	Cannot affect chances of loss	Cannot affect exposure to loss
LACK OF INFORMATION (FOG)	Do not know size of loss	Do not know chances of loss	Do not know exposure to loss
LACK OF TIME	Insufficient time to understand or reduce size of loss	Insufficient time to understand or reduce chances of loss	Insufficient time to understand or reduce exposure to loss

Note: Relationships are expressed in terms of their impact on the commander/decision-maker.

TABLE 1

ultimately strengthened their defense. If he chose to cross, there were two possible outcomes. One was that the American forces would succeed in establishing a bridgehead and be in a position to exploit into the depths of the German defenses. The other possible outcome was that the crossing attempt would fail, probably with heavy losses. This situation illustrates the basic risk paradigm (fig. 1). There are two actions the decision maker can take. One is the "sure" action, the status quo. The other, "risk" action, has two possible outcomes, a gain or a loss. If we knew the gain outcome were going to occur, we would certainly select the risk action. Likewise, if we knew the loss outcome were going to occur, we would select the sure action. The problem is that, in a risk situation, the commander can never be sure which outcome will occur. The basic risk paradigm can serve as a model for developing concepts of risk.²⁶

B. RISK DECISION MAKING

Having addressed the inputs to a risk decision, the components and determinants; as well as the outcomes of the decision, it is now necessary to examine the decision making process itself.

Kenneth R. MacCrimmon and Donald A. Wehrung, authors of Taking Risks: The Management of Uncertainty, have proposed a model for dealing with risk. This model, called the REACT model, consists of a five-step method of making risk decisions; Recognize and frame the risk, Evaluate the risk,

BASIC RISK PARADIGM

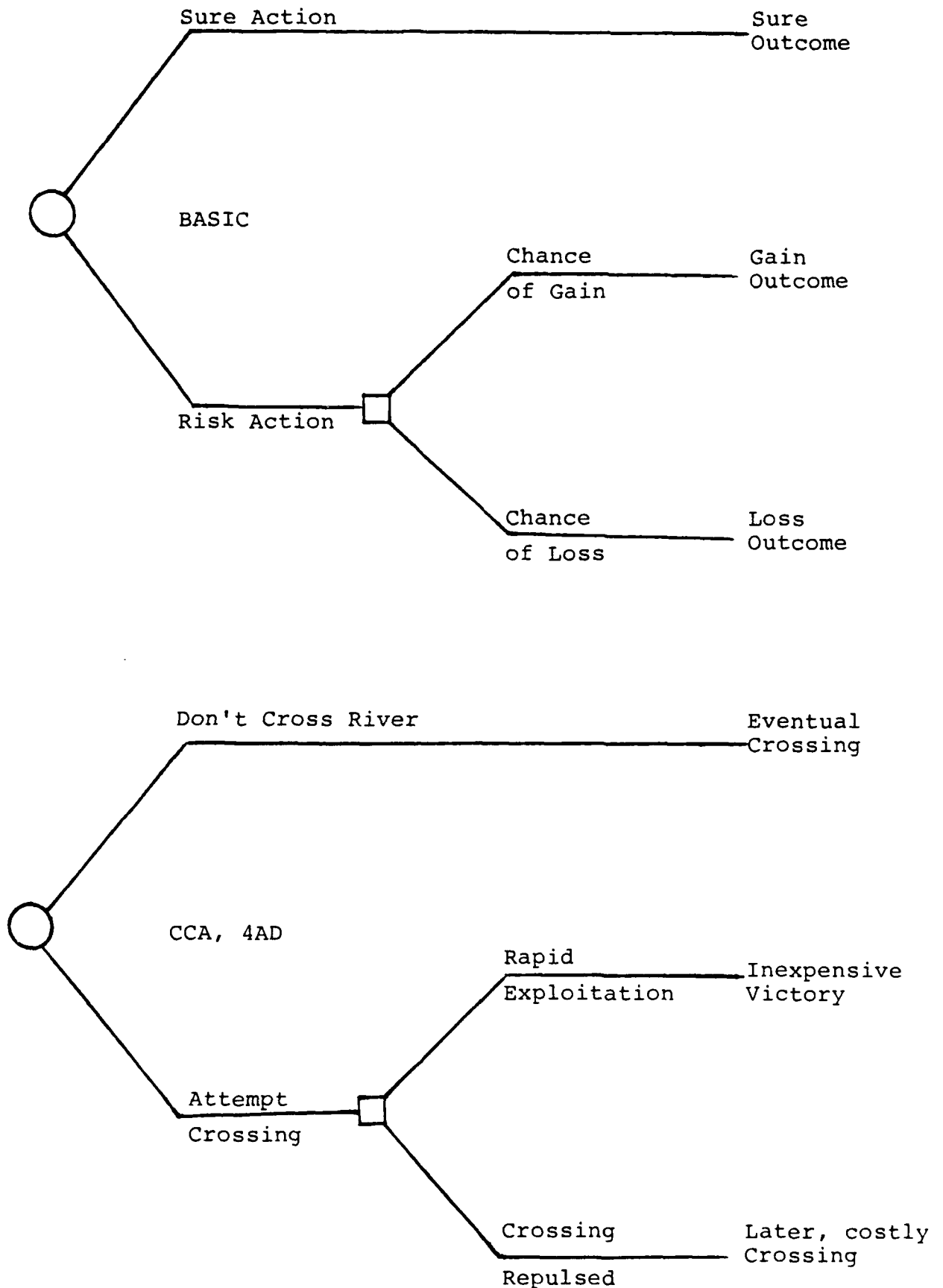


FIGURE 1

Adjust the situation, Choose a course of action, and Track the outcome. While the model was developed for making risk decisions in the business world, it has considerable application for dealing with risk in a combat environment. It can provide commanders a systematic method of making risk decisions in a tactical situation. The model is shown at Figure 2, and will be described in tactical terms in the following paragraphs.²⁷

The first step is to recognize where risks exist and frame the risks in terms meaningful to the decision-maker. It is important for decision makers to recognize that, due to the uncertain nature of war, risks abound in every tactical operation. There can never be a risk-free situation, nor does the enemy have the luxury of avoiding risk. Risk situations are not limited to the side with fewer forces. The commander must recognize where risk situations exist that will offer an opportunity to increase the chances of success and decrease the likelihood of enemy success.

Having identified where risk opportunities exist, the commander must evaluate each risk in terms of acceptability. How acceptable a risk is must be determined by balancing the possible gain against the possible loss, and factoring in the likelihood of success. Unless evaluation leads to a clear-cut yes or no decision to take the risk, the commander will probably try to adjust the situation to increase the probability of success if the

REACT MODEL OF
RISK DECISION MAKING

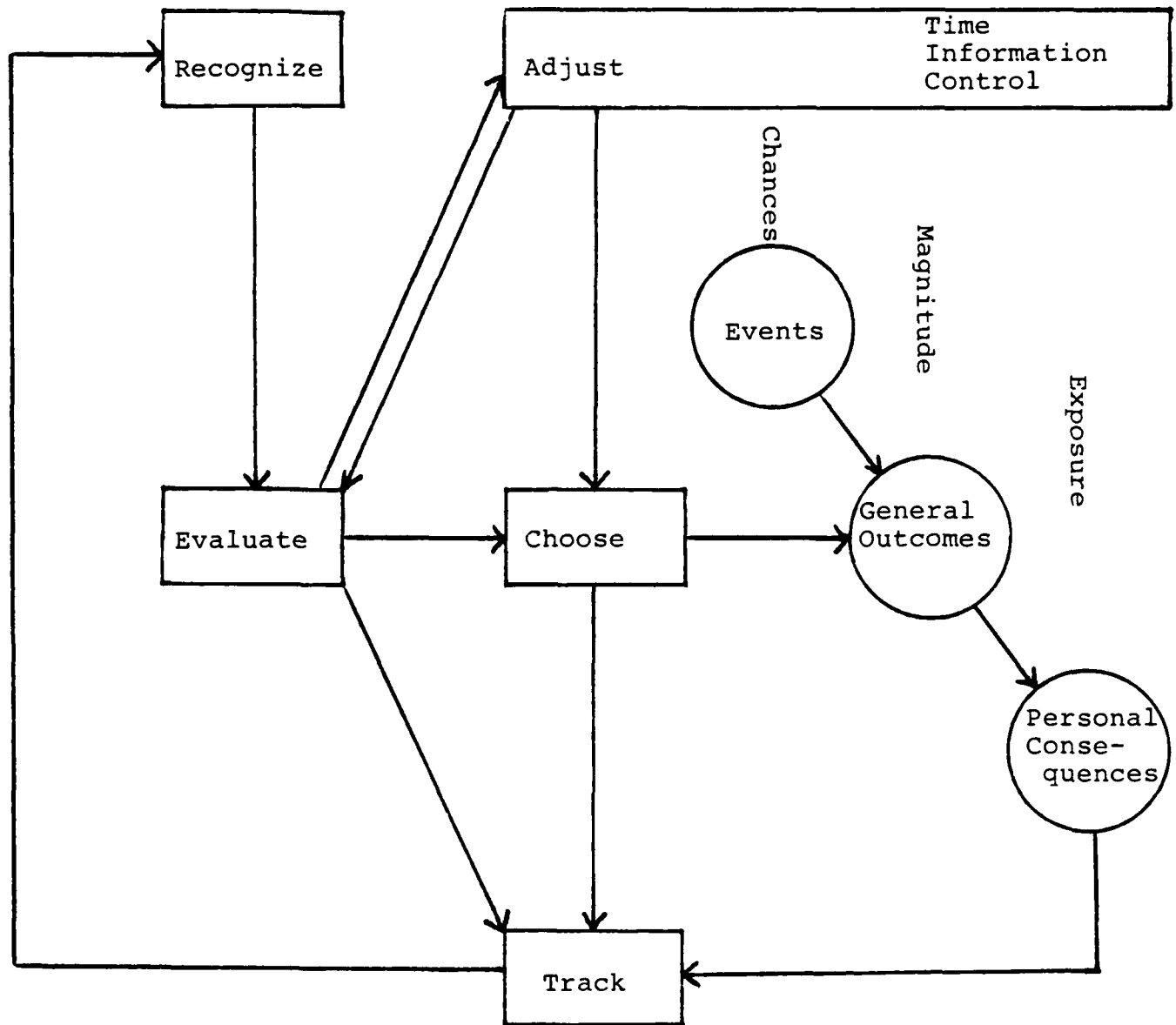


Figure 2

risk is taken.

There are two basic reactions a commander can have when confronted with a risk situation; passive and active.

Passive behavior implies simply making a choice when faced with a risk decision. Passive behavior does not mean that the decision maker avoids risks. Instead, passive reactions to risk consist of making a decision without any attempt to modify the situation.

The second basic reaction is an active one. Active behavior involves trying to adjust the risk-situation to one more favorable for the decision-maker. The active decision maker may attempt to modify the risk components; i.e., magnitude of loss, chance of loss, or exposure to loss. He may also attempt to alter the risk determinants in his favor; by reducing fog, friction, and gaining time for decision making. Again, being active when confronted with risk situations does not imply that the commander either seeks or avoids risk. It merely describes how he reacts when confronted by a risk situation. One description of active reaction to risk is provided by the German Major General Baron von Freytag-Loringhoven:

Man can never fully control chance; he can only succeed in minimizing its effects by making dispositions to meet the various possibilities, and, where he has the strength, by assuming an active not a passive attitude.²⁸

There are, of course, unlimited actions the commander can take to adjust the situation and increase the chance of reaching a correct solution. In framing the risk situation,

Brigadier Richard Simpkin postulates that it assists the decision maker to make "reasonable" assumptions that adjust the situation to one more favorable. He states the commander can make assumptions in three areas: predictability, intervisibility, and flexibility. Predictability addresses the friction aspect of war by increasing the confidence the commander has in anticipating the actions of the enemy and his own subordinates. Intervisibility addresses the fog of war by using assumptions about the enemy or the situation to replace hard facts that are unknown, thus increasing the probability of a correct estimate of the situation leading to a better decision. Finally, flexibility addresses the time problem in war by preparing for options to react to contingencies rapidly and efficiently.²⁹

Other adjustments can be accomplished prior to the unit encountering the risk situation. For example, prior to commitment, the 4th Armored Division trained in England by combat command. When committed, the 4th fought as it had trained. This served to reduce the friction inherent when subordinate elements were operating independently. Another factor reducing friction was the high level of tactical and technical expertise demonstrated by the leaders of the division. For example, platoon leaders were trained to command companies, resulting in less friction when forced to do so.³⁰ The important point here is that any reduction of the effects of fog, friction, and time serves to reduce the

risk inherent in the situation.³¹

Of course, there is a limit to the adjustments the decision maker can make to improve his situation. Time, events, and resource limitations combine to force a decision upon the commander. Reference to the basic risk paradigm (fig. 1) reminds us that the outcome of the decision is dependent on chance. Still, "Luck favors the skillful commander." Attributed to Moltke, this quote implies that probabilities will side with the decision maker who has more correctly adjusted the situation in his favor.

Once the decision is made, the problem and the battle are not over. Instead, events will unfold as the commander has set them in motion; modified by fog, friction, enemy actions, and chance. Soon, the commander will be faced with a new situation, requiring branches or sequels to the old plan; or an entirely new plan and decision. Thus, there always exists a requirement for the commander to track the risk decision until the action is completed or a new decision is required. For example, the 4th Armored Division's success crossing the Moselle at the Dieulouard Bridgehead and subsequent penetration to Arracourt forced new risk decision's on MG Wood. How deep should he advance into enemy controlled territory and how long should the 4th attempt to stay behind enemy lines, were new decisions requiring risk analysis and bounded by uncertainty.

C. RISK INCLINATION

Not every decision maker has the same inclination to

take risk. Psychological make-up, experience with risk, education, training, and external pressures cause commanders to generally be either risk takers or risk averters. Risk takers are comfortable in risky situations and do not hesitate to make decisions when the outcome is uncertain. Risk averters are uncomfortable in risky situations and attempt to delay or avoid decisions in an environment of uncertainty. Risk takers and risk averters each approach the components of a risk situation differently. These approaches are summarized at Table 2. Note that in this table, risk averters require certain characteristics, while risk takers accept others.

As stated above, risk averters seek to delay decisions in the hope that the situation will clear up and the decision can be made with near perfect information. Unfortunately, that is not what happens. Rather than gaining more perfect information, a delay can have the effect of increasing the effects of fog and friction, i.e., the control and usable information already possessed may be lost.

No general would go into action carelessly, without adequate preparation or without a general idea of the enemy's positions and intentions; but he must bear in mind that it would be an error, because it would be useless, to wait for a situation to clear up entirely. He must remember that the weightiest decisions are generally made in the "fog of uncertainty." If the great generals at Marengo, Ulm, Jena, and Koeniggratz had waited for the situation to clear up fully, they would have missed the proper moment for action, and military history would be without some of its most brilliant days.³²

CHARACTERISTICS OF RISK AVERTERS AND RISK TAKERS

COMPONENTS OF RISK	RISK AVERTER REQUIRES	RISK TAKER ACCEPTS
Magnitude of Potential Loss	Low maximum loss Low commitment More information on losses More control over losses	Higher maximum loss Higher commitment Less information on losses Less control over losses
Chances of Potential Loss	Low chance of loss Familiar environment Few uncertain events More information on chances More control over uncertain events Low uncertainty	Higher chance of loss Unfamiliar environment Many uncertain events Less information on chances Less control over uncertain events High uncertainty
Exposure to Potential Loss	Low exposure Shared responsibility More information on exposure More control over exposure	High exposure Sole responsibility Less information on exposure Less control over exposure

TABLE 2

Clearly, the correct decision can not be made if the key information is lacking, but the commander who waits for perfect information and control risks making his decision too late to effect the outcome of the battle.

IV. RISK-TAKING DOCTRINE

A. RISK TAKING AND AIRLAND BATTLE

Having developed a theory of risk taking, it is now necessary to examine the U.S. Army's current doctrine toward risk-taking. As a starting point, it is important to establish the environment in which our Army expects to fight. FM 100-5 states:

The high- and mid-intensity battlefields are likely to be chaotic, intense, and highly destructive.³³

Even in conventional combat, operations will rarely maintain a linear character. The speed with which today's forces can concentrate and the high volumes of supporting fires they can bring to bear will make the intermingling of opposing forces nearly inevitable.³⁴

The more fluid the battlefield, the more important and difficult it will be to identify decisive points and to focus combat power there.³⁵

These statements combine to illustrate an environment of uncertainty, lethality, fog, and friction, i.e., a risk situation.

After establishing the environment in which it will fight, U.S. Army doctrine describes the doctrine it will use to win. During the introduction, the basic doctrine of the AirLand Battle was stated as well as the requirement to act according to the four tenets: initiative, agility,

depth, and synchronization.

Also, in the introduction, the relationship between the first tenet, initiative, and AirLand Battle Doctrine was established. In describing the tenet of initiative, FM 100-5 continues to relate initiative to risk as follows:

In the chaos of battle, it is essential to decentralize decision authority to the lowest practical level because overcentralization slows action and leads to inertia. At the same time, decentralization risks some loss of precision in execution. The commander must constantly balance these competing risks, recognizing that loss of precision is usually preferable to inaction. Decentralization demands subordinates who are willing and able to take risks and superiors who nurture that willingness and ability in their subordinates.³⁶

This quotation describes the necessary atmosphere as one in which decisions, and risk taking, are allowed at all levels. The decentralization of decision making described essentially trades precision in execution for initiative; accepting the risk involved with that decision.

Having established the necessary conditions for exploiting the initiative, FM 100-5 moves to the next tenet, agility. Agility - the ability of friendly forces to act faster than the enemy - is the first prerequisite for seizing and holding the initiative.³⁷ To accomplish this, FM 100-5 states:

... both leaders and units must be agile. Friction - the accumulation of chance errors, unexpected difficulties, and the confusion of battle - will impede both sides. To overcome it, leaders must continuously "read the battlefield," decide quickly, and act without hesitation. They must be prepared to risk commitment without complete information, recognizing that waiting

for such information will invariably forfeit the opportunity to act.³⁸

This discussion of agility unfortunately confuses the risk determinant lack of control (friction) with the risk determinant lack of information (fog). While it is certainly true that friction will impede the operations of both sides; the concept of friction places no burden upon leaders to "read the battlefield." Instead, lack of control due to friction can only be overcome by adjusting the risk situation. FM 100-5 suggests one way to adjust the situation to account for friction in its previous discussion on decentralization of decision making and risk taking authority. Decentralization, when combined with mission orders (also required by FM 100-5), increases agility because subordinate leaders are not required to "check" with the commander prior to acting or taking a risk. Thus, the decision cycle is actually shortened while accounting for friction.

The second half of the agility route above is true. Commanders must "read the battlefield," decide quickly, act without hesitation, and risk commitment without complete information. All these actions are consistent with the theory of risk previously developed. However, to be correct it must be understood that these requirements arise as a result of the impact of the risk determinant lack of information (fog), magnified by the determinant lack of time. Commanders must be aware that they can delay their decision to obtain critical information, but to do so risks

losing the initiative.

AirLand Battle Doctrine is based on two more tenets; depth and synchronization. However, FM 100-5's discussion of these two tenets makes no reference to risk. Depth is the extension of operations in space, time, and resources. Through the use of depth a commander obtains the necessary space to maneuver effectively; the necessary time to plan, arrange, and execute operations; and the necessary resources to win.³⁹ Unfortunately, space, time, and resources are finite commodities. This forces decision makers into risk decisions regarding how to allocate space, time, and resources to win. Since time is a risk determinant, the failure to link depth in time to the creation of opportunities and adjustment of risk situations is a major doctrinal omission.

The last tenet is synchronization. Synchronization is the arrangement of battlefield activities in time, space, and purpose to produce the maximum relative combat power at the decisive point.⁴⁰ The process of synchronization is tied to the risk decision making process. In order to synchronize diverse battlefield activities; such as SEAD fires, close air support, and enemy arrival in the target area; commanders have to rely on assumptions. These assumptions center around enemy actions (IPB) and the time, space, and resources needed to conduct friendly operations. It must be realized that these assumptions are affected by the risk determinants friction, fog, and time. Therefore,

all attempts at synchronization contain an element of risk. So, planning for synchronization should be based on the REACT model.

B. RISK TAKING AND THE DECISION MAKING PROCESS

FM 100-5 requires that leaders must take prudent risks to gain and maintain the initiative. In order for a risk to be prudent, it must be based on a sound decision making process. The decision making process used by the U.S. Army is the Military Decision Making Process, contained in Chapter 5 of FM 101-5. Unfortunately, the discussion of the process makes no reference to risk. However, during the previous discussion on risk theory, the REACT model was suggested as an appropriate process for making risk decisions. The Military Decision Making Process has been set next to the REACT model at Table 3 to demonstrate the possibility of incorporating the model into the process.

In analyzing the Military Decision Making Process, it is useful to consider not only the process as contained in FM 101-5, but also the Command Estimate contained in ST 100-9, published by the Command and General Staff College at Fort Leavenworth. ST 100-9 is used in educating future commanders and senior level staff officers in applying the Military Decision Making Process. As such, it represents the written doctrine that is taught, and probably applied in the field. ST 100-9 actually goes into much greater detail than FM 101-5 concerning the process and considers risk several times.

MILITARY DECISION MAKING PROCESS AND THE REACT MODEL

MILITARY DECISION MAKING PROCESS	REACT MODEL FOR RISK
1. MISSION RECEIVED	RECOGNIZE RISK
2. INFORMATION TO COMMANDER/STAFF	
3. MISSION ANALYSIS/ COMMANDER'S GUIDANCE	EVALUATE RISK
4. STAFF ESTIMATES	ADJUST SITUATION
5. COMMANDER'S DECISION/CONCEPT	CHOOSE
6. ORDERS PREPARATION	
7. ORDERS APPROVAL	TRACK THE RISK
8. ORDERS ISSUANCE	
9. SUPERVISION	

TABLE 3

In step 1 of the process, the commander analyzes the mission in terms of: the task to be performed, the purpose to be achieved, and constraints on the units actions. ST 100-9 adds that the commander's analysis includes "acceptable levels of risk." The term "acceptable levels of risk" is not appropriate, except as a constraint in the nuclear context. More importantly, during the mission analysis, the commander needs to begin identifying opportunities for risk and framing them in terms of potential gain vs loss and in terms of the risk components of exposure, chance, and loss (physical, mental, moral respectively). This can be accomplished by incorporating the Recognize step of the REACT model into the mission analysis.

During step 2 of the Military Decision Making Process, the commander and staff exchange information. Through his analysis of the mission, the commander will begin to ask specific questions of the staff. While FM 101-5 and ST 100-9 do not address risk at this point, this is the best time for the commander to begin addressing the risk determinate of lack of information. The realization of risk opportunities during mission analysis should logically lead to questions that will clarify the risk in the situation.

Step 3 is the restating of the mission and the issuance of the commander's guidance. FM 101-5 is deficient in that there is no reference to considerations of risk in the issuance of guidance by the commander. ST 100-9 again

addresses risk only from the nuclear/chemical troop safety perspective. In its listing of elements for inclusion in the commander's guidance, there are two opportunities for consideration of risk. The first element is that of specific courses of action that the commander may want developed. At this point in the decision making process, the commander should have identified potential risk opportunities, such as economy of force or pre-emptive attack. He should present the staff with these risk opportunities in the form of considerations in course of action development or as specific courses of action. The second element that should include risk considerations is that of AirLand Battle considerations, such as deception. Given the previous analysis of the relationship between risk and the AirLand Battle Doctrine, inclusion of risk considerations at this point is warranted.

Concurrent with this step, it is appropriate to conduct the risk evaluation required as the second step in the REACT model. This is not a decision to accept a particular risk, but an evaluation in terms of potential loss versus gain based on the chance of a favorable outcome. Unless the commander performs this evaluation, in broad terms, he will be unsure whether to include the risk opportunity in his guidance and for further development. This evaluation is key in guiding the staff through the next step of the decision making process, which is the staff estimates.

In preparing the staff estimates, the various staffs

are concerned primarily with three subjects: facts, assumptions, and courses of action. In collecting facts, staffs focus in two areas. The first is facts that experience and professional expertise indicate will be required. The second is facts that the commander specifically requires. Each staff also develops assumptions to replace facts that are required, but not available. Finally, each staff assists in course of action development and/or analysis.

In describing production of facts and assumptions, FM 101-5 and ST 100-9 make no reference to risk. However, in the development of courses of action, ST 100-9 states that an analysis of friendly and enemy strength may indicate some situations in which acceptance of risk would be appropriate. ST 100-9 also requires the acceptance of risk in the development of a scheme of maneuver. Additionally, in support of the basic AirLand Battle doctrine, ST 100-9 states commanders may attempt to seize the initiative by accepting risk.⁴¹ This is the only case in the Military Decision Making Process where it addresses risk in enough depth to support the doctrine of FM 100-5.

Step 4, the staff estimates, is the point at which the Adjust phase of the REACT model begins. The staff estimates must serve as a means of reducing fog (lack of information) and friction (lack of control). Thus, the estimates assist in presenting the commander with a situation that supports the best possible decision. Hopefully, some of the

commander's specific requests for information will be addressing the risk determinants. In developing assumptions, staffs must consider the three types of assumptions required by Brigadier Simpkin; those addressing predictability, intervisibility, and flexibility. Assumptions accounting for these three factors assist the commander in adjusting the risk situation to one in which he can make a decision with more confidence in the outcome.

A major effort during this step in the decision making process is wargaming. After developing the courses of action, the staff and commander compare courses of action by wargaming each friendly course of action against enemy actions. The outputs of this wargaming are significant. They include a detailed course of action, synchronization matrix, decision support templates, and a recommended course of action. ST 100-9 states the wargame indicates possible risk situations and possible actions that can be taken to reduce such risk. It emphasizes that risk is inevitable on the battlefield and to attempt to eliminate it would be unreasonable.⁴² Thus, the wargame serves as the primary means of adjusting risk. In this respect, the Adjust step of the REACT models is already incorporated into the command estimate, ST 100-9, but not in the Military Decision Making Process, FM 101-5.

Concurrent with the staff estimates is step 5 of the decision making process, the commander's estimate and decision. The commander's estimate is similar to an estimate

by the G3, except that the commander's estimate results in a decision. The commander's decision can be selection of a fully developed, and wargamed, course of action or selection of a new course of action. However, ST 100-9 states there is risk involved in selecting a course of action that has not been prepared by the staff. This is consistent with the REACT model that requires adjustment of the risk situation prior to choosing to accept a risk. In choosing a course of action, the commander should consider the risk involved in terms of the basic risk paradigm (Fig. 1). The wargaming and recommendation of the staff should provide the commander with the potential loss, gain, and probability of success of each course of action.

During the remaining steps of the Military Decision Making Process, the REACT step of Tracking the risk takes place. The commander and staff can continue actions that will decrease the effects of fog, friction, and time on the outcome of the risk decision. At the same time, new risk opportunities will appear that will require a new decision making process.

The analysis of the Military Decision Making Process as contained in FM 101-5 and ST 100-9 has indicated that risk is probably not addressed in the depth it needs to be in order to support AirLand Battle Doctrine. However, incorporation of the REACT model for risk decision making into the process as described above can correct the apparent doctrinal deficiency.

C. RISK TAKING AND LEADERSHIP DOCTRINE

Based on the requirements deduced for the Army in the introduction of this monograph, leadership doctrine must accomplish two things. It must produce leaders at all levels who take risks and it must produce a command climate that is supportive of risk taking. In analyzing the leadership doctrine of the U.S. Army with regard to risk, this monograph will focus on FM 22-103, Leadership and Command at Senior Levels.

Chapter 4 of FM 22-103 focuses on the skills required of senior leaders. It divides these skills into three categories: Conceptual, Competency, and Communications. Listed among the competency skills is risk-taking. In developing the skill of risk taking, FM 22-103 states,

risk taking means making needed decisions in varying degrees of uncertainty... risks are calculated decisions made carefully; they are not gambles... most choices involve some risk ...risk taking does not limit the fact that risk exists. Instead, it makes the reality of risk an opportunity.⁴³

These statements are consistent with the risk theory developed earlier. Leadership doctrine recognizes that risk decisions involve uncertainty, requires a valid decision making process, and risk can not be avoided. This portion of the leadership doctrine supports AirLand Battle Doctrine concerning risk. It places a requirement on leaders to be risk takers.

The skill discussion continues by linking tactical and technical competency to the ability to take risks

effectively. Additionally, in support of theory, the commander is required to weigh potential loss against potential gain. Finally, FM 22-103 implies that technical and tactical competency is a means of adjusting the risk situation in favor of the competent leader. This observation is consistent with the experience of the 4th Armored Division in World War II. Both LTC Abrams and Colonel Clarke were regarded as extremely competent officers, both tactically and technically. This is demonstrated by their invention, during early 1944, of the burst-on-target method of adjusting tank fire. This method remained the preferred method of sighting tank main guns until the late 1970's and the adoption of computerized fire control.⁴⁴

Having adequately addressed the requirement for leaders to be risk takers, FM 22-103 fails to adequately address the development of a command climate that supports risk taking. In Appendix C, the manual lists the characteristics of healthy and unhealthy organizations, but without going into any depth concerning how to create the healthy climate. FM 22-103 states that in healthy organizations, "Risk is accepted and valued for growth and development." For unhealthy organizations, the manual states, "Minimizing risk has a very high value." These two simple statements support the characteristics that were developed in risk theory for risk takers and risk averters. Unfortunately, there is no depth to the discussion.⁴⁵

In seeking to address the deficiency of the doctrine

regarding the development of a climate supportive of risk taking, it is helpful to remember Major General Eddy's comment just prior to the Dieulouard Bridgehead decision examined in the introduction. MG Eddy stated:

"Well, I will leave it up to you. If you think you can get through I'll let you go. If you think you can't make it, no blame will be attached to you."

This statement sums up the most important indicator of a climate supportive of risk taking; the attitude of the superior commander. MG Eddy's comment indicates trust in the subordinates decision making ability, as well as acceptance of the responsibility for the decisions of subordinates. These two characteristics must be present for a climate supportive of risk taking to exist.

The experience of the 4th Armored Division can point towards additional factors in building an atmosphere supportive of risk taking. Colonel (Retired) Jimmie Leach, a company commander in the 37th Tank Battalion during the dash across France and the Lorraine Campaign, cited confidence as the primary contributor to an attitude toward risk taking. He states that the superb level of individual and unit training the 4th achieved during the two years of preparation for war led to a confidence level throughout the division that was conducive to risk taking.⁴⁶ Additionally, the characteristics listed in Appendix C of 22-103 for healthy organizations are all supportive of risk taking. However, they are insufficient if the two characteristics

cited above are not present.

V. CONCLUSION

AirLand Battle Doctrine clearly requires prudent risk taking and a climate that supports it. In developing the theory of risk it is clear that risk situations are a combination of components in the physical, cybernetic, and moral domains of battle. It is equally clear that the degree of risk in any situation is determined by the fog of war, friction, and the time available. Both theory and doctrine require that risk decisions be made based on a sound process. The REACT model for risk decision making provides that process. Finally, risk taking leaders are likely to be more successful in battle than risk averting leaders.

In terms of doctrine, the basic doctrine of FM 100-5 ties in well with the theory of risk. The tenets of initiative and agility appear to adequately address risk. Unfortunately, the tenets of depth and synchronization appear deficient in terms of incorporating risk. The Military Decision Making Process as outlined in FM 101-5 and developed in ST 100-9 appears deficient in incorporating risk considerations to the level required by a sound risk decision making process. However, incorporation of the REACT model into the Military Decision Making Process would assist in correcting this deficiency. FM 22-103 develops the requirement for leaders to be risk takers sufficiently to support AirLand Battle Doctrine. Unfortunately, the required doctrine concerning the development of a climate supportive

of risk taking is not present.

VI. RECOMMENDATIONS

It would appear based on the theoretical and doctrinal discussion above that prudent risk taking is imperative for success on the tactical battlefield. Accordingly, an AirLand Battle Imperative should be added stating: Take prudent risks. The imperative could then be supported using the theory developed above.

FM 100-5 should develop the concept of risk in the tenet of depth. This development should center around the risk determinants of lack of time and lack of information (fog). Both of these are critical to the Deep battle, as well as the application of resources (of which time is itself one).

FM 100-5 should also develop the concept of risk in the tenet of synchronization. This development should center around the REACT model requirement to Adjust the situation and around the determinant lack of control (friction). Both of these are critical if synchronized combat operations are to take place in a risk situation.

The Military Decision Making Process and the Command Estimate Process need to incorporate the REACT model in order to adequately address risk.

FM 22-103 needs to go into more depth concerning the development of an atmosphere that supports risk taking. This could be addressed in the form of methods, techniques, and procedures.

ENDNOTES

1. Hugh M. Cole, The Lorraine Campaign, (Washington, D.C., 1965), pp. 75-79.
 2. United States Army Armor School Pamphlet, The Nancy Bridgehead, (Fort Knox, Ky, 1954), pp. 24-25. Fortunately for the Americans, the risk paid off. CCA attacked across the river, smashed the German counterattack, and drove deep onto the Lorraine Plateau. 4th Armored Division successfully encircled Nancy and was able to exploit the situation for four days before being forced to assume a defense against attacks by the Fifth Panzer Army.
 3. U.S. Army, Field Manual 100-5, Operations, (Washington, D.C., 1986), p. 14.
 4. Ibid, p. 15.
 5. 4th Armored Division, Official Unit History, dated January 1944, p. 1.
 6. Major Jerry D. Morelock, "Major General John S. Wood: Redleg Combined Arms Leader Supreme," Field Artillery Journal (Nov-Dec 1985), pp. 26-30.
- Colonel (Retired) Jimmie Leach, Interview conducted at Flint Hall, Fort Leavenworth, Kansas on 10 October, 1989. In describing the preparation of the 4th Armored Division for war, Colonel Leach stressed the impact of the varied training environments on the soldiers and leaders of the division. The Texas prairies were flat and without concealing vegetation. This forced leaders at all levels to be innovative in their approaches to solving tactical problems.
8. 4th Armored Division, Official Unit History, dated January 1944, p. 2.
 9. John S. Wood. Letter to Lt. Gen. Patton dated 2 October, 1944, mailed from Headquarters, 4th Armored Division.
 10. 4th Armored Division, After Action Report, 17 July, 1944 to 31 August, 1944, dated 24 October, 1944.
 11. Leach, Interview, 10 October, 1989.
 12. The Nancy Bridgehead, p. 4.
 13. Ibid, p. 10-16.
 14. 4th Armored Division, After Action Report, 17 July, 1944 to 31 August, 1944, dated 24 October, 1944.

15. Colonel (Retired) Jimmie Leach, Lecture delivered to the Advanced Military Studies Program, School of Advanced Military Studies, Fort Leavenworth, Kansas, on 11 October, 1989.
16. Carl von Clausewitz, On War, edited and translated by Michael Howard and Peter Paret, (Princeton, New Jersey, 1976), p. 191.
17. Lieutenant Colonel Igor D. Gerhardt, "Risk: The Commander's Decision," Military Review (August 1980), p. 15. Current U. S. Army use of the word "gamble" is not supported by definition or theory. Commander's often state, "I am willing to take a risk, but not a gamble." This phrase is not supported by the definition of a gamble, which is simply to take a risk. However, in common Army usage, the term "gamble" has come to imply a chance taken with no control over the outcome and little chance for success.
18. Kenneth R. MacCrimmon and Donald A. Wehrung, Taking Risks, (New York, 1986), p. 9.
19. Ibid, p. 10.
20. On War, p. 117.
21. Ibid, p. 102.
22. Taking Risks, p. 15.
23. On War, p. 119.
24. Ibid, p. 140.
25. Taking Risks, p. 18. This table is adapted from that of MacCrimmon and Wehrung to reflect the military theoretical concepts fog and friction as well as the domains of battle. The important point to emphasize is that the impact of fog, friction, and time on the commander is to force him to take risks in all the domains of battle. These risks are forced upon him. The question is how the commander will adapt to the risk situation presented to him.
26. Ibid, p. 11. Here, the basic risk paradigm is used to illustrate the decision situation confronting Colonel Clarke at the bridgehead. Again, the paradigm is adapted from that of MacCrimmon and Wehrung.
27. Ibid, pp. 30-31.
28. Major General Baron von Freytag-Loringhoven, The Power of Personality in War, (Harrisburg, Pennsylvania, 1938), p. 91.

29. Brigadier General Richard E. Simpkin, Race to the Swift, (London, 1988), p. 200.
30. Leach, Lecture, 11 October, 1989.
31. Captain Charles A. Leader III, "The Talent for Judgement," Marine Corps Gazette, (October, 1983), pp. 49-50. Captain Leader divides risk into two types: systematic and non-systematic. The first type consists of uncontrollable events, such as weather, i.e., friction. The second type is determined by the characteristics of the opponents and the situation, i.e., the fog of war. Captain Leader argues that the leader with a talent for judgement will attempt to reduce to the greatest extent possible the non-systematic risk before choosing which risk to accept.
32. The Power of Personality in War, p. 91.
33. FM 100-5, p. 2.
34. Ibid.
35. Ibid., p. 3-4.
36. Ibid., p. 15.
37. Ibid., p. 16.
38. Ibid.
39. Ibid.
40. Ibid., p. 17.
41. U.S. Army Command and General Staff College, Student Text 100-9, (Fort Leavenworth, Kansas 1988), p. 3-10 thru 3-12.
42. Ibid., P. 4-16.
43. U.S. Army, Field Manual 22-103, Leadership and Command at Senior Levels, (Washington, D.C., 1987), p. 33.
44. Lieutenant General William R. Desobry, Interview conducted by LTC Ted S. Chesney, on 7 September, 1977, at Lampasas, Texas.
45. FM 22-103, Appendix C.
46. Leach, Interview, 10 October, 1989.

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