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Research Product 87-02

Observations from Three Years at the National Training Center

ARI Field Unit at Presidio of Monterey, California
Training Research Laboratory

January 1987

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report presents the results of a conference at which Colonel Larry Word gave his observations of the National Training Center. Colonel Word had been the Chief Observer/Controller for Mechanized Infantry Battalions for 3 years. He describes NTC operations and factors that help to ensure successful performance. The NTC has recently begun some brigade-level operations and Colonel Word discusses initial lessons learned. National Guard performance, home station training, After Action Reviews, and plans for the future are covered.		

U. S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

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Research Product 87-02

**Observations from Three Years
at the National Training Center**

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Education and Training

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FOREWORD

The Army Research Institute has a major research program that supports the National Training Center (NTC). The development of the NTC and the preparation that units undergo before rotating to the NTC have been constantly evolving.

This report describes the observations of one of the senior observer/controllers after 3 years at the NTC. He describes the training process as well as factors that enhance NTC performance. This report will be interest to all units who go to the NTC.



EDGAR M. JOHNSON
Technical Director

OBSERVATIONS FROM THREE YEARS AT THE NATIONAL TRAINING CENTER

EXECUTIVE SUMMARY

Requirement:

The National Training Center (NTC) exposes units to the most realistic, intense training environment ever developed. As chief observer/controller for mechanized infantry battalions, Colonel Larry Word had an unique opportunity to observe units during training. This document presents his views of the training process at the NTC and the preparation units need before going there.

Procedure:

This document is a transcript of Colonel Word's debriefing upon his departure from the National Training Center. Colonel Word had been stationed at the NTC for 3 years and also has years of experience in REALTRAIN/MILES implementation.

Findings:

In order to perform well at the NTC, units should put the most emphasis on training at the platoon level. Units build task-force-level skills quickly at the NTC, but if there is a lack of skills at the lowest level, plans are not executed. Platoon leaders must be able to quickly and effectively assess situations to implement the task force commander's plans.

Physical conditioning is important to sustaining performance under NTC conditions. The command group needs to develop a sleep/rest plan to get the rest units need yet still maintain the level of effort required in continuous operations.

Another important factor is that leaders all understand and use METT-T (Mission, Enemy, Terrain, Troops-Time Available) analysis in their planning, and have a thorough knowledge of doctrine and SOP. The transition from doctrine to tactics is through METT-T analysis, and it is the responsibility of every leader.

Brigades may not be able to afford to take one third of the mission time available to develop their operations order. It leaves insufficient time at the lowest levels. That commander's guidance is clearly communicated has also been established as critical.

Decisions must be made on the centralization or decentralization of brigade assets, which are often not effectively under anyone's control. The NTC experience suggests that some of these assets are more effectively used when centralized, while others appear to be more effectively used when decentralized.

A problem at home station training is determining the standards for collective training. Engagement simulation has helped to measure success or failure. The Army Training and Evaluation Program (ARTEP) has not provided measurable standards.

MILES is the key to training at home station. Leader training can be done without taking everybody out to the field. Drills and situational exercises are also useful tools. It is also important to ensure that NCOs are conducting individual training during time that isn't scheduled.

Utilization of Findings:

The information from this debriefing will be of value to all units who go to the National Training Center.

OBSERVATIONS FROM THREE YEARS AT THE NATIONAL TRAINING CENTER

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OBSERVATIONS FROM THREE YEARS AT THE NATIONAL TRAINING CENTER

Introduction

This document is an edited version of a debriefing given by COL Larry Word in July, 1985, upon his departure from the National Training Center at Fort Irwin, CA. COL Word had been stationed at the NTC for three years. He served as the Chief Observer/Controller for mechanized infantry battalions. The debriefing took place at the Presidio of Monterey, CA. In attendance were representatives of the Army Research Institute from the Presidio of Monterey Field Unit, the Fort Leavenworth Field Unit, and headquarters in Alexandria, VA. Also attending were representatives from Arroyo Center, Human Resources Research Organization (HumRRO), Perceptronics, and the 7th Infantry Division. The questions in this document came from these attendees.

Description of NTC Operations

Question: Would you describe how the NTC operates?

Fort Irwin is a FORSCOM post. The commanding general and his command and staff elements are, therefore, FORSCOM. The infantry and armor battalions which make up the OPFOR regiment are also FORSCOM assets. The Operations Group is responsible for training the visiting task forces and is a TRADOC organization.

The National Training Center process begins with a visit of some of the senior NTC trainers to the commander of the brigade that is going to rotate through the NTC. When the brigade commander goes to the NTC to train, he will bring a mechanized infantry battalion, armor battalion, his direct support artillery battalion, and most of his brigade support slice elements. In other words, not only the combat support types of slice elements (the air defense engineers, intelligence and so on), but also a fairly large contingent of combat service support because he must provide all the administrative and logistical support for his battalions once he hits the ground. About 2500 to 3000 personnel, depending on the size of the unit, arrive for training.

Representatives from the Operations Group go to see them several months in advance. The visit has two purposes. The first is to determine from the brigade commander what his training objectives are. Over time, we have developed a series of fairly standard task force level missions: deliberate attack, night attack, movement to contact, defense in sector, defense from a battle position, and in some cases, delay. However, the brigade commander can alter the missions to some extent. He could say, "Based on our contingency plans, I would like more emphasis on offensive operations," or "I think a particular weakness for us is working at night. I would like to work more in hours of darkness." He can request anything that he really wants to emphasize. That input is taken back to Fort Irwin and used to develop the specific scenarios which are written by the NTC Operations Group.

The second thing we do in that visit is to brief the units that are coming out. As the senior trainer for mech infantry battalions, I usually take at least three officers. One briefs at the task force level (operational/intelligence/fire support); another briefs the combat service support personnel, and one of my company level people briefs at the company and platoon level.

First of all, we describe the administrative requirements and rules of engagement. However, most of the effort during that day is talking about lessons learned. Hopefully, this visit is several months before the unit comes to the NTC, so that the unit has the opportunity for some of those lessons learned to be valuable in the final months of training.

Development of Scenarios

After we come back from the unit visit, an element of the Operations Group develops specific scenarios for the rotation (to include all of the Soviet orders for the OPFOR forces). Everything is integrated into a package that

makes sense. This includes looking at when the unit was last at Fort Irwin, what operations they conducted, and what areas of the post they operated in. There is unit institutional memory and we want to try to make the visit as new as possible in terms of the training they are going to receive.

An important point is that the brigade commander has a tremendous amount of input into what his units actually do, although we develop the specific scenario. The brigade commander is privy to those scenarios because he is the senior trainer. We have had some brigade commanders say, "I really don't want me or my staff to know specifically. I want this to come down through your channels, so that everybody is getting an exercise." In other cases a brigade commander might become deeply involved in what is going on, because his primary interest is in looking at his two battalions and he wants to be able to program his time and efforts to do that.

The three battalions (the mech and the armor task force and Artillery battalion) are unaware of what they are going to be doing, except for the general time frame that they are going to be at Fort Irwin and that they will get some force-on-force and live fire training. We have been very successful in maintaining secrecy about what units are specifically doing, so that the units are reacting to a tactical situation on a day-to-day basis.

Description of Training

At the National Training Center we set up what is called the 52nd Mech Division Headquarters during the training, so that the chain of command is preserved, i.e., it is the brigade commander that gives the orders to the task force and gives his commanders his guidance.

The units pick up prepositioned combat equipment when they deploy to the NTC. They bring their own wheels and any items that we are short at the NTC. They know these requirements in advance. Primarily, all their combat vehicles are drawn from an equipment pool at Fort Irwin. It requires a couple of days to draw the equipment, check the instrumentation, check MILES, receive the initial operations order and give them some time to acclimate to the desert. They get some initial reconnaissance and very quickly (usually within two days after the main body of troops hits Fort Irwin) deploy to the field for fourteen days of nonstop training.

Both forces go to the field initially as a brigade. In fact for the last eight or nine months, we have run brigade level operations in which the mech task force, the armor task force, and the artillery battalion are all deployed in a brigade mode. The brigade is given a series of objectives or missions. The brigade commander has total control over his assets and cross attachments and over how he conducts those missions.

To the extent that we can, we have begun to conduct brigade level operations. Our capability is fairly limited because of the size of the opposing force and the necessity of keeping a handle on the scenarios to keep the OPFOR lined up. We have found that we have a lot more flexibility than we thought. I think most brigade commanders feel that they really are in a brigade-level environment. They have an opportunity for the brigade staff to exercise. That occurs for about the first four days. The number of missions

depends on the scenarios but usually the units have at least a couple of offensive missions and one defensive in that period of time.

At that point, one task force goes to live fire training. They have a couple of defensive missions and an offensive mission with live fire. They use all weapons, except TOW and DRAGON for which we use MILES simulation because of the cost of ammunition.

The other battalion task force remains in the force-on-force environment working against the OPFOR regiment for about another four or five days. At this time, there is another breakpoint where the two task forces flip--the one that has not been to live fire goes to live fire, and the one that has come out of live fire goes back into a force-on-force period of training against the regiment.

Right now there are about ten missions in a fourteen-day rotation. About seven missions are force-on-force and three missions are live fire. After each mission a series of After Action Reviews (AAR) are given--at platoon, company, and task force levels. In addition, at the breakpoints between the phases that I described, we are now doing After Action Reviews for the operating systems. After the first three or four days, we will pull the company XO's, the battalion XO and the administrative logistical personnel of the task force together and give them an AAR covering Combat Service Support that cuts across missions. We are slowly getting to the point where I think we are going to be giving periodic After Action Reviews in all of the other systems--Fire Support, Intelligence, NBC and so on.

Although the continuity of missions is broken up to some extent with the leaders receiving the After Action Reviews, the units are in full-up tactical mode from the time they roll out of the dust bowl area where they pick up their equipment. They are required to reconstitute their forces at the end of each battle. Every soldier that is wounded or assessed as having been killed must be evacuated. All the casualties must be accounted for, using the Army's casualty feeder report system. Not until both of those activities take place are those casualties allowed to return to the unit.

The units must also recover damaged equipment and requisition replacement items for equipment that is destroyed. So these CSS activities are ongoing once a mission has been completed. In many cases, a warning order will be received for the next mission while they are conducting the one that they are involved in.

When the mission is complete, one of the problems that units have is that they have three competing things to do. They have forces trying to reconstitute, resupply, refit, and reorganize (CSS); they have the initial planning going on for the next mission; and they have the After Action Review to attend. So, it is a hectic time for leaders.

It is also hectic for the Operations Group because we have to try to get all of that done, yet maintain a schedule which is going to put the units in a stressful environment. A major goal is to put the unit through fourteen days of as tough and stressful training as we possibly can. We must be successful since we're called the Ranger School West for units. I don't know anybody

that has ever complained about it being too easy. We somehow find a way to maintain that process, but it is a balancing act.

That is an issue which is worthy of exploring in a little more detail. How do you maintain stress on a unit and, at the same time, do the best job of training that you possibly can? Obviously, we would like to have leaders well rested and alert in the After Action Review, but long breaks degrade the realistic stress we are trying to simulate. So our goals for NTC training are competing and it is pretty easy to slide in one direction or the other if we are not real careful.

At the end of fourteen days the unit comes in from the field and begins the turn-in process. During that time, we conduct a series of final After Action Reviews, both at Company level and at the Task Force level. The final After Action Review at the Task Force level is conducted with the Task Force commander. We go over lessons learned. We have the instrumentation system to assist us by calling up examples of things that he did well or did poorly. The focus of the final After Action Review is to emphasize the training required at home station when the unit returns.

Throughout the rotation, we are developing a written Take Home Package for the unit which includes summaries of each daily mission. It also includes an overall trends summary where we look at trends across the seven operating systems. A fairly extensive Take Home Package is prepared with written material, video tapes of all After Action Reviews, and audio tapes of radio nets. This package is provided to the task force as it leaves to go back to home station.

Structure of Operations Group

Let me get into the organization of the Operations Group. I have already mentioned there is a plans and operations element that builds scenarios and operates the division cell during the actual rotation. There is an element that runs the live fire range, sets up targets, and runs the range. There are now three trainer or Observer/Controller (OC) teams. One team takes the Armor Task Force during force-on-force missions and one takes the Mech Infantry Battalion. The third team runs Live Fire for both the armor and infantry. In addition, there is an element that runs the instrumentation system.

Some of the instrumentation personnel are split among the OC teams, but there is an overall organization in the instrumentation building that has the video section, and the instrumentation section to tie everything together.

We plan to add a brigade-level training cell and a separate light infantry OC team. We also plan to add a larger logistics cell, because of the J-series organization. The slice that comes out to assist the brigade commander is the forward support battalion and it is the crux of that organization. We are building a cell to look strictly at that forward support brigade. We had some personnel from the school come in to test that organization. While they were at NTC, we were conducting brigade-staff-level After Action Reviews, but the schools could not support that effort so we are not now conducting brigade-level After Action Reviews.

Question: Has a TDA increase been authorized?

Yes.

Question: Is there an artillery team coming?

We have an artillery team that is the fourth element that we are planning to add to the structure at NTC. We have always had the artillery team that manages the artillery battle and makes sure that we are replicating indirect fires. Now that team is being extended so that there will be a full OC training team for the Artillery Battalion.

Question: You mentioned the light infantry coming to NTC. Is that in addition to or instead of the heavy teams?

In addition to.

Question: So there will be three battalions at a time?

Correct. We plan to add a light force OC team to control the light battalions that rotate with the heavy brigades. The 101st will bring their own brigade element, so there will be two brigades. The way the 101st worked was pretty interesting. There weren't any major problems. In fact, for the first time we had a couple of brigades having to coordinate with each other. We had helicopters flying across boundaries and they learned very quickly how much coordination needs to happen.

The light OC team is not going to be a full team. The concept is that the Operations Group team will go down through the company level, and platoon-level trainers or OCs will come from the unit.

Question: Will they do After Action Reviews at platoon level?

Yes, they sure will.

Question: Are you going to have a train-up period for those trainers?

Yes. It will be the unit's responsibility to bring the platoon OCs in advance of the unit to receive some training. It's an obvious problem. We are not going to get the same quality of performance from a platoon trainer that comes one time and has a week of training compared to someone that has been on the ground at NTC for two or three years.

Types of Units Going to the NTC

Question: Which units go to the NTC? For example, what about the National Guard?

As you know, most of the FORSCOM divisions do not have three full brigades. Some have National Guard round-out brigades. Others, even if they don't have round-out brigades, have affiliated units. In the last three years we have had six National Guard battalions rotate to NTC as a round-out or affiliated unit. We have had one company team come from Germany. We have had two cavalry squadrons, one from the 1st Infantry Division and one from the 24th Division. We also have had the first Light Infantry Task Force from the 101st and we are scheduled to have another four to six of those rotations over the next year. Basically, all the rest of the units are the normal FORSCOM heavy brigades.

Question: How are the brigades scheduled?

FORSCOM headquarters does the unit scheduling. There have been some adjustments to it from time to time. One brigade had the COHORT schedule changed on them and they had to fall out. It's an interesting phenomena to see who jumps into the holes. We have had a couple of divisions that have gotten a lot more experience at the NTC because they have grabbed every opportunity that they could, regardless of how much preparation time was allowed them.

Successful Performance at the NTC

Question: What do you tell units about how to train to perform well at NTC?

Let's talk about what we mean when we say a unit is successful at the NTC. A successful unit at the NTC is one that learns a lot. One of the consequences of learning a lot is beating the OPFOR and it is important for units to keep both of these points in mind. It would be foolish to say that it isn't important to go out and beat the OPFOR. That is the bottom line and it is a building block for a lot of esprit, but it can be over emphasized. Even if a unit is not successful in a particular mission, there is a tremendous amount of learning that occurs. In fact, I think some of the best lessons learned are the big mistakes that units and leaders make that are indelibly imprinted in their minds, based on having lost badly to the OPFOR. If a unit hasn't beaten the OPFOR in a particular exercise, it may have nothing to do with what they may or may not have learned. Both those areas of focus are important and I think most units understand that.

Platoon-level Training

There are a few things that are important to success at the NTC. First of all, I urge units to put the maximum amount of training effort at the platoon level. We are finding that it is relatively easy to meld together the commander, his staff, and the company commanders at the task force level. We see very rapid progress made by almost every unit in jelling as a staff and commanders. This is particularly true with some preparation before coming to the NTC. We don't see any units coming to the NTC that haven't made a major effort to prepare to get ready. As they complete that train-up period, I

don't believe that they need to focus all of their resources on task-force-level training with every soldier in the field. Certainly they should do some of that, but it is expensive and tough to coordinate. You can do a whole lot of platoon training for the same level of effort as four or five days of task-force-level training.

Question: So, the key to winning out there is centered around platoon-level training?

That's right. While units are at the NTC, they tend to build task-force-level skills quickly. What they can't overcome very easily is a lack of skills or a lack of ability to execute down at the lowest level. We are constantly running into the situation where task forces develop good plans that they cannot execute, simply because the skills are not there at the lowest levels to make it happen. I'm not talking about exotic fancy plans. I'm talking about just nuts and bolts kind of attacking and defending.

If they don't have platoon leaders that know how to quickly and effectively assess the situation and to supervise and make every minute count in defensive preparation, it doesn't make any difference how well a task force commander laid out those goose eggs. They are not going to win when the OPFOR comes rolling at them with 160 vehicles. So I would urge units over and over again to work on building the primary building block, which is down at platoon level. If we get platoons that can execute, the other things fall in place pretty quickly.

Most of the National Guard units have done extremely well at the NTC because they can't train at higher levels very often. They tend to focus training at the lower levels. In many cases the National Guard squads and platoons are better prepared to do the job at that level than the active units are. When we get them together out at the NTC as a task force, they very quickly come together because the building blocks are very solid. I think that has been a real plus and one of the reasons the National Guardsmen have done as well as they have. Without getting into more detail, I'll just say that the fundamental building block is at the platoon level. We cannot spend too much time with platoon training.

METT-T Analysis

The second thing is that every leader needs to understand and use METT-T (Mission, Enemy, Terrain, Troops-Time Available) analysis. For a lot of years I thought METT-T was a philosophical underpinning of what we did. It was nice to review when I went to the schools and, although I was probably using some of that process any time I planned, I did not deliberately look at each of those factors. What needs to be understood is that the way we transition from doctrine to tactics is through METT-T analysis.

Our doctrine gives us broad guidance; tanks and infantry attacking on a single axis or the tanks supporting by fire and the infantry dismounting. These are broad guidelines on how an attack might take place. Which of those options we decide to lay out in our planning is, and will always be, based on this analysis of the mission, the enemy, terrain, troops and time available.

Another misconception is that the METT-T analysis is the Battalion S-3s business. It is, but it is also the business of every leader. If a squad leader is looking at how to put his squad in the ground, he goes through the same process of METT-T analysis in order to develop his plan. If the medical platoon leader develops a plan at the task force level for how the casualties are going to be evacuated, then he goes through the process — What is the mission? What is the enemy situation? What does the terrain look like? METT-T is a process for every leader to learn and use.

Whenever a unit has a training exercise or is doing something at squad, platoon, company or even task force level, I try to convince leaders to question the METT-T analysis as part of the evaluation. In other words, to make leaders justify their plans. Why did he decide to give the two lead companies sectors as opposed to battle positions? How did he develop the disengagement criteria and why was he going to leave that unit forward as long as he intended to leave them? The whole evaluation process is geared to developing and articulating what those factors of METT-T were.

There is more than one way to accomplish any operation and invariably there are differences of opinion about how they ought to be executed, but it always comes down to several of those factors of METT-T and how we read them. Maybe a leader placed more importance on the enemy's speed when he selected an option. We are never going to totally settle an argument when two leaders disagree slightly about how a plan should have been laid out. However, we can agree on what factors of METT-T drove the decision in either case. If we haven't considered all of the options and looked at the various factors and shadings of METT-T, then we may not have done a good job in that analytical process. METT-T analysis blends very quickly into the command and staff actions, the development of estimates, the development of the tentative plan and that whole process. I think one of the successful things that has occurred at the NTC and one of the reasons units have continued to progress out there is a much more sophisticated METT-T analysis on the part of all leaders to come up with a good solid plan.

Leadership

The third point doesn't have anything to do with training in terms of doctrine or tactics. It involves some operational aspects of leadership. Whenever a leader needs to get something done, there's three things that have to be there if he hopes to really be successful.

The first thing is that the leader has to know what he wants to see when it's all over. If he is building a defense and laying out his plan he needs to know exactly what that should look like based on his experience, his knowledge of doctrine, and so on. Again, this is at every level.

Let's take an example of a squad leader that is going into a defensive position and is at the point of preparing the positions. If that squad leader does not know what a doctrinal position for a DRAGON, for a machinegun, for a two-man rifleman position should look like—how that position is constructed, how much overhead cover is required, the level of camouflage that should be there—then he is going to have a difficult time ending up with what should be there. So, knowing the standard is the first step and it comes through

military experience. It comes through a knowledge of doctrine and SOPs (Standing Operating Procedures). If the unit is going to refuel during hours of darkness, there is probably a company SOP that says exactly how that should happen. In this case, the standard is that the company SOP procedures will be followed. There are a whole lot of places where a standard may be articulated.

The second operational aspect of leadership is that orders must be communicated. The soldiers that are going to do the job have to understand clearly what the boss wants to see. Maybe all he has to say is, "We refuel tonight per company SOP" if he's confident that all his soldiers understand that SOP. His knowledge of his men and what they know may allow him to avoid articulating the details. However, if he has any doubts about being understood, then he needs to communicate his order well.

A platoon leader may leave a position to get an OPORD and do some reconnaissance and say to his platoon sergeant, "When I come back, I want precombat checks completed. I want all weapons to have been test fired. I want long-range checks with all radios completed. I want PMCS (Preventive Maintenance Criteria Service) to have been pulled on all the vehicles." There should be no doubt in the sergeant's mind what the boss wants and when he expects to have it happen.

The third operational aspect of leadership is that the leader must ruthlessly enforce the standards. As soldiers get fatigued, you will hear a whole lot of reasons why they should not meet certain standards. For example, a team may have fought a battle all day, moved most of the night, and rolled into a battle position around midnight. They are dead tired. You may hear something like, "Hey boss, what we gotta do is let the troops get some rest. They have been up for two nights. We'll put these guys to bed for a couple of hours and get up at 0300 hours and start digging positions." Wrong answer.

At the NTC, we are seeing that the troops probably aren't that tired. It's the leaders that are tired. It's convenient to use "the troops are tired" as a great excuse for a lot of leaders that are dog tired. What they really mean is, "It's not the troops that need some sleep, it's me." The answer is that we cannot afford to do something like that as a unit. It doesn't mean that we don't sleep. It doesn't mean we are not going to give some careful attention to some people digging and some people getting some rest.

The point is that we do not compromise our standards. Leaders have got to recognize the problem. When the boss comes back and something has not happened, punishment has to be meted out. It has to be clear that we are not going to accept anything less than adherence to those standards. We have found that units can do a lot of things if we provide leadership that enforces the standards. They invariably get things done. Poor enforcement of standards is a creeping kind of thing. The first time you compromise on a standard, the next time it is much easier. I try to stress that standards are something that leaders have to recognize, know, and enforce at the lowest levels.

The toughest thing junior leaders have to learn is that they are not doing their troops any favors, in a real combat environment, by letting them off the

hook. When soldiers do not dig in before an 0600 attack, there is no assurance that at 0400 they are not going to get a tremendous artillery barrage that would cause most of the unit to become casualties. At the NTC we provide opportunities to practice the toughest kind of leadership for 24 hours a day for 14 days.

Physical Conditioning

An important factor for success is physical conditioning. There are two aspects to it. First, we have the physical demands for the infantryman. Infantrymen have got to be in good shape. That's why walking twelve miles in three hours with a full load is in the EIB. Everybody understands that it isn't over when they get to the end of the twelve miles. They are supposed to be able to go to battle at that point.

What isn't understood is that peak physical conditioning is required for everyone, not just the Infantry. Every single person in a combat zone benefits from being in good physical condition, even a radio operator in the TOC. Conditioning helps fight fatigue, the heat, and the psychological stress of fear. I won't tell you there is a whole lot of evidence on that but I believe it is a clear benefit. Every single person in the unit will do his job better if he is in good physical condition because he can stand the pressure and the fatigue.

One of the big problems with the National Guard has been physical conditioning. They have to find some way and some incentive to do PT. They don't have to be on active duty to do it. They can have their own individual PT program on their own time. They should do this anyway from the standpoint of health. We must do a better job of getting the National Guard in better condition. Two or three of the guard units have come to the NTC and have been on a real upswing in terms of learning. However, their learning trailed off towards the end because of physical conditioning.

Work/Rest Plan

The other thing we have to look at is sustaining that physical conditioning through rest. One of the major benefits of the NTC is that we have reversed an extremely dangerous trend. For a long time leaders were usurping the authority and responsibility of soldiers several levels below them in the chain of command. The "zero defect Army" was an unfortunate phrase; the idea that somehow no mistakes can be authorized. We have had company commanders doing platoon leader's jobs and even doing squad leader's jobs. In that environment, platoon leaders and squad leaders quit doing things because the boss is going to take care of it. We ended up with an environment where a leader was doing his own job and at least pieces of a lot of other people's jobs. This attitude stifles initiative.

The minute a combat leader walks into the NTC, he is faced with the problem that he cannot do anybody else's job for them, not any part of it. Not only that, he has to hunt for somebody that can do his job for four or five hours a night so he can sleep.

A battalion commander quickly finds out that he has to sleep. The activities at the NTC never cease. They are either preparing for a battle, fighting a battle, or recovering from a battle. Lack of rest will have bad effects on the commander's ability to accomplish the next mission, if not the one he's currently engaged in. All of a sudden leaders are having to develop subordinates so they can do their own job and a couple of key personnel have to be developed to the point where they can take over the commander's position so he can go to sleep and things will be exactly as if he had been awake and supervising.

A tough job to deal with is how to get the key group rested; how everybody in the organization can get the rest they need and still maintain the level of effort that they have to maintain. There are no cookbook solutions. It depends on the mission, where they are, how much they've moved and so on. It depends on the individuals to some extent. Some people can get 30-40 minutes of sleep several times during the day. Others need 4-5 hours of uninterrupted sleep. It is clear after two or three days, however, that everybody has to take a long break where they get 6 to 8 hours of sleep.

Units are now wrestling with solutions. There isn't a whole lot in our doctrine about sleep plans. It would be a worthwhile research project to see what solutions could be developed. For example, how long can a leader get away with the least impact on the unit? So the other aspect of physical training is how to maintain that conditioning through rest.

Brigade-level Operations

Question: What lessons have been learned from brigade-level operations?

In the last seven or eight months we have started to put some brigades under the microscope. Some things are starting to surface that show that the need to train at brigade level is as great, if not greater, than at the task force level. However, at the NTC, the focus is on task-force-level training and this should continue. Whatever is done at brigade level will be done with that priority in mind. We have discovered that we can do more than we initially thought we could with brigades without sacrificing any training objectives at the task force level.

One-third/Two-thirds Rule

We have learned that a brigade may not be able to afford to take one third of the mission planning and preparation time available. There is a Command and Control doctrinal rule that says whenever we get a mission to take one-third of the time for ourselves and reserve two-thirds for our subordinates. It is incumbent upon those at high levels to shave that as much as possible.

Brigade staffs have to be very nimble in accepting the mission from division and deciding how to employ the task forces. At brigade level, they don't have to think in as much detail; they don't have to consider every foxhole that goes in the ground. They are considering broad avenues of

approach and broad missions. The brigade has to make their decisions very quickly.

Commander's Intent

It is very important that the brigade commander recognize how important it is for his commander's guidance and how he sees the battlefield to be communicated. One very strong principle that has emerged in our doctrine, as part of the Airland Battle, has been the emphasis on understanding intent. Our doctrine says that the intent two levels up must be clearly understood. Obviously, the company commander is going to tell a platoon leader what he wants to do. However, as part of the company commander's orders, he must be very explicit about what the battalion commander's intent is. That is true at every other level.

The brigade concept of the operation has been fuzzy on many occasions. They have good sets of graphics; they have a written order coming down from brigade. However, by the time somebody enunciates intent, the task force commander is well into his planning. We cannot have that. That intent has to be communicated at the time the frag order is given.

Warning Order

Another thing that has emerged is the importance of a warning order. The brigade should try to give enough information in a warning order for a task force to begin planning. For example, "We are giving you a temporary defensive position here. The mission is a deliberate attack with an LD here. Here is the objective and approximate boundaries." If a task force commander is confident that this is not going to substantially change, he can start planning for the attack. He doesn't have to wait an additional four or five hours doing nothing before the S-3 arrives with the order. The battalion staff can begin reconnaissance and tentative planning.

The brigade staff, the S-3, and the commander should ask themselves, "Have I given people as much key information as I have right now?" The brigade commander may not know where a boundary is. If he hasn't gotten sufficiently along in the staff planning process, then obviously he can't communicate it in the warning order. If he can, he does; and if he does, then he knows that his task force commanders can begin to do a lot more detailed planning with confidence that it will stand up under the operation order. So we have gained hours of very precious staff planning time.

Employing Helicopters

Another lesson learned is the importance of organizing the assets that come to battle at the brigade level. Attack helicopters are a division asset, however a company of attack helicopters may be put under the operational control of the brigade commander. They should be kept under control at brigade level to influence the action in the brigade sector. The most critical problem with employing attack helicopters is they do not get committed to battle in time to influence the action. The decision making

process to commit them--receiving key intel, getting it into the brigade command channels, and the decision to launch--is part of the problem.

A second problem is that if those helicopter assets are near the brigade support area, the time required to get forward is longer than units expect. Some aviation commanders will take a straight line distance and say, "We can fly from here to there in x minutes." Invariably, they can't. They haven't accounted for the security that must be executed along the route. They have to know how far forward they can fly without being in a totally secure mode. When attack helicopters move, they are going to get their scoutbirds out in front of them if they are not sure of the enemy situation. They just don't go blindly rushing into enemy territory. To the extent that we can coordinate in advance and know which areas are secure, they can move faster in a less-secure mode and get forward. It is a major problem getting attack helicopter assets into the battle in a timely manner.

One of the problems is that aviation personnel don't recognize how often they need to set up forward holding areas. The brigade commander and the aviation community has to gamble a little here in two respects. One, they need to push themselves further forward where they might be risking artillery.

Second, a brigade commander must make a decision and say, "I really believe I'm going to commit the attack helicopters in the 2-5 sector. That is the most dangerous avenue." He is going to keep them under his control and they can go elsewhere, but some decisions can be made early to allow those aviators to get forward. They fuel up, go up, sit down, and the pilot sleeps underneath the helicopter. They have saved ten miles of movement at first light the next morning. Part of the problem is the ability to employ those weapon systems after it gets first light. Obviously, the enemy is going to take advantage of every moment of darkness to move so we don't have daylight where we can leisurely make decisions to get forward. The minute it turns light we have to have those helicopters as close to where we want to employ them as we can.

There is this torturous line of communications to get aviation committed. The information comes in, the decision is made, the rear TOC gets the message, the aviation TOC gets it, the aviator gets it and he turns the crank. If you did a time study, it is obvious that a lot of time can be shaved in that whole process. A big lesson learned from the NTC is that we have to streamline this process a whole lot more or the attack helicopters do not get forward. It is a big brigade-level and aviation problem. It is being recognized and worked more extensively than in the past.

The aviation community is doing away with the word "crew-rest." That has been kind of a joke at the NTC because it is important that aviators rigidly maintain some rules for making sure the pilots are well rested. If a truck driver goes to sleep he might run off the side of the road and bust an axle. If a helicopter pilot goes to sleep, he might run into a mountain. We lose a valuable aviator and a valuable helicopter, but aviators take a lot of kidding about crew rests. So, the term is now "fighter management."

A standard attack helicopter technique is the one-third concept. One-third are in battle, one-third are coming back to rearm and one-third are coming forward to sustain aviation combat power over a period of time.

However, at other times, we have to figure out how to mass combat power. There are going to be times when we want every single attack helicopter fighting the battle simultaneously, particularly if the brigade commander has indicated that he wants to start the battle early forward. In terms of crew rest, fuel and ammunition it is important that every one of our attack helicopters is up shooting at certain points in the battle. Effective mass applies to helicopters just as it does to infantry, artillery, and everything else. Those are the two biggest lessons that are starting to emerge at the brigade level because the brigade commander normally controls the attack helicopter assets.

Combat Support

The major problem in combat support is to synchronize these efforts with maneuver. For example, the OPFOR looks very carefully at their jamming and listening efforts. They synchronize it with their maneuver. Obviously, they have some advantages. They all speak English. With a little experience, they are probably better than the average Russian in figuring out whether it is a battalion or a company command net. The OPFOR will listen to a battalion command net up to the point that their lead elements are coming within engagement range and then turn on the jammers. They find a lot of information available. Right when that commander thinks he is doing okay and talking to everybody, all of a sudden his net is jammed. Right when his command and control is crucial. That is an example of how an intelligence asset is synchronized with the maneuver scheme.

Another problem is that there are a lot of brigade assets that are out of control, such as intelligence assets, GSR's, DFers. Nobody is coordinating where those assets are. Nobody is looking at the security requirements for them. Nobody is telling the artillery where they are. After someone has a BMP or two penetrate his lines and spots somebody off his left flank, he doesn't know who they are and dumps artillery on them. He finds out it is one of our own DF stations. It is a major problem and we are just starting to get a handle on it. The brigade S-2 can rarely give you any idea where they are. He is lucky if he is talking to fifty percent of them. It is a major problem for the S-2 and the commander.

Air Defense and Engineers

Air defense and engineers offer a similar problem. Some of those assets are going to task force level. To what extent do we want to control them at brigade level versus decentralizing those assets to the task forces? That is a lot tougher question for me to answer because the NTC focus is so heavily on the task force. For example, is it better for a brigade commander to keep the engineer company together and work on various obstacles that he considers most important? Or, is it better to slice up each of those platoons and put them down at task force level? In this case, I lean towards the task force level. I'm not impressed with an obstacle plan where the person that is drawing those lines on the map has no idea exactly where the weapons are that are going to cover those obstacles. Somebody at brigade level will probably not know.

At brigade level, some distinct priorities can be given to the task force and brigade-level assets. For example, we might not give an engineer platoon to the reserve battalion in the preparation phase. So the brigade commander might beef up the other task force if he is interested in obstacles on a specific avenue of approach. I don't think the brigade commander should develop detailed plans and keep the engineers under his control to execute the obstacles. I think that we are going to find those resources have to be given to a task force commander. Those obstacles must be covered by fire. The only person that is going to know that for sure is the commander responsible for covering the obstacle.

I'll give a couple of examples. Let's say that the avenue of approach is not well defined but there is a series of positions or terrain masses that allow some excellent places to position our weapons. Where we put the obstacles may be optional. There isn't a lot of limiting terrain to tie into. We want some obstacles to delay the enemy and, specifically, where we put them is flexible. Yet, there may be a favorable place to position weapons, so the obstacle ought to be placed at stand-off range.

In another case, an avenue of approach might narrow where we might position overlooking that choke point. With a little bit of effort we can choke off the whole avenue of approach. So the location of the obstacle becomes fixed. The maneuver units have some choices about selecting where their weapons are placed in order to take advantage of the obstacle. The decision on where obstacles are going to go is a decision which should be made on the ground by the engineer and the maneuver commander who is going to cover it by fire.

Air defense is another example. The decision will probably be to centralize control of these assets at brigade level. There are not a lot of pinpoint decisions that need to be made about air defense. They have to protect forward elements. They need to protect command and control facilities, and CSS facilities are obviously important. The brigade is going to have some division assets, such as Chapparals and a slice of Stinger or Red-eye and Vulcans. They are much better able at brigade level to look at how best to deploy those weapons. The brigade commander can prioritize those as well as a task force commander can. So, in the case of air defense, we are retaining the assets higher and getting more centralized control.

Combat Service Support

Maintenance and Supply

Combat service support (CSS) is a major arena of concern at the brigade level. As we field modernized equipment in a heavy force, modular replacement of parts is performed at the brigade support area. A lot of the specialized maintenance personnel are at that level. There is not a real good handle on when to push those personnel forward or when to hold them back. In some cases, it makes more sense to pull those personnel to a centralized level. In other cases, pushing teams forward may make sense. That is a METT-T analysis

decision and that decision will change based on what they are doing. No set procedure is going to work for all situations. The brigade S-4 is very heavily into METT-T analysis. He must decide when he will release his five thousand gallon tankers to go forward. This violates the normal situation where the task force comes back and refuels, but there are situations where they have to get forward to refuel. A task force can only refuel about fifty percent with its capacity. When you look at the number of services and areas of support for all the classes of supply requiring some decision at brigade level on how best to utilize it, it is a big job.

Typically, once the brigade trains are on the move, nothing happens. People don't refuel or eat or do anything because the trains are on the move. If a key truck or vehicle or generator runs out of MOGAS it doesn't make any difference if it is five gallons or five thousand. Supplies have to be at the right place at the right time. At the NTC, we are not fully exercising those brigade trains to the greatest extent, but we have learned that if units don't pay a lot of attention to combat service support planning, they will go down the drain very quickly.

Pre-packaging Assets

One particular area of importance in CSS is class IV: barbwire and mines. These are the assets we use for countermobility and survivability in defensive posture. Prepackaging these assets in standard pallets that can be loaded on trucks with fork lift equipment can make everybody's job easier. For example, a pallet that we call an "A" pallet may have x meters of standard fence. If we ask for an "A" pallet, we know that we will get everything that we need to build x meters of this fence. The long pickets, the short pickets, the concertina, the barbwire is there. An "A" pallet is a simple thing to ask for. It is also a simple way to maintain inventory of what is available, where it is going, and who owns it. A "B" pallet might be x number of mines or x meters of a standard minefield. It depends on the size of the pallet, what kind of fork lifts and trucks are available, and how many pallets can be put on the trucks. A "C" pallet might be enough overhead cover for one platoon. It includes whatever is being used: reinforced plywood, steel plates, long pickets or sand bags. Based on the strength of rifle platoons in the task force, and subtracting out the class IV that they carry with them, this pallet is enough to take care of one platoon. In a defense, the commander knows how many platoons he has in his organization, and it is easy for him to call for x number of these pallets. That is another example of something that I think can be done at brigade level to focus efforts to assist accountability and command and control, and the timely pushing forward of some very key items.

Reconstitution of Units

Another CSS area of concern is reconstitution of the units. One of the big advantages of the J-series organization for the heavy task force is they went from three armored ambulances to eight. This recognized that, previously, we did not have the equipment to care for the soldiers in the battlefield. I'm making the assumption that we will be in at least a mid-intensity environment where we can't fly in like we did in Vietnam and pull

troops out of the forward areas. To some extent we will always be able to use helicopters, but how far forward they go and under what conditions is risky in a mid-intensity environment. What does the company commander do after he has sent his ambulance with five casualties back to the battalion aid station? Where does he go next when he has two other patients laying on the ground who are going to die if they don't get care very quickly? He has to plan additional vehicles. If he has a two-and-a-half ton vehicle, he might have some chains and litters that are part of the standard equipment so it can be transitioned from hauling ammunition to hauling casualties quickly and effectively. If that isn't planned, soldiers will probably die for lack of care. There have to be contingencies developed at every level.

Communication

There has to be good communication. Typically, there is not good communication in the admin/log side of the house. Our doctrine says there is an ALC (admin log center). At the task force level this is a 577 command track which belongs to the S-1 and S-4. There is a RATT (radio teletype-writer) rig that can support Combat Service Support communications. If we can't communicate quickly from the task force to the brigade, the timeliness of CSS support is going to suffer. We are finding that a CSS operation that mirrors a tactical TOC is essential. Yet there is nobody specifically designated in those battalions to operate that facility. If we don't have a focal point for command and control, all of the assets in the combat service support quickly bog down. The classes of supply and all the services are unbelievably complex. It's a major battalion and brigade problem.

In the NTC experience, a lot of the CSS problems are at brigade level. They don't know where the ammunition is or they don't know how much they have. A battalion S-4 might be told there is no more 7.62 ammunition when, in fact, there is a lot of it in the brigade area or it was all given to the armor task force and he isn't aware of it.

Ammunition Simulation

Question: How do you allocate ammunition to the task forces?

There are allocations for the various types of blank ammunition. Units know well in advance what is being allocated. It is possible to increase that with ammunition from home station, but there is sufficient ammunition.

There are ten missions for a task force. If a unit has fifty thousand 5.56 mm rounds, there is a tendency to divide fifty thousand rounds by ten missions and to divide that in half for the two task forces. Each task force gets 2500 rounds for each mission. That is not the way to do it. Ammunition should be front loaded. There will be casualties in the exercise. Units don't get committed, or vehicles break down, or tanks get lost and never fire a round. To build up a good training basic load initially and to have enough ammunition at various levels (because units should have emergency class III and class V capability in their trains and brigade should have back-up), every

round available for the rotation might be issued. I guarantee you that nobody will run out of ammunition. If you allocate by missions, nobody has enough ammunition and, initially, at the end they have a whole lot left over.

Types of Ammunition

Let me go into the various types of ammunition. ATWESS represents Dragon, Viper and TOW. Those rounds are painted three different colors by the task force. If the Task Force gets 500 ATWESSs, the task force commander decides how many of these rounds are TOWs, how many are Vipers and how many are Dragons. He makes the decision because he could ask for what he wants and get it out of brigade. If he decided he needed more TOWs, he could request that 200 of those rounds be TOWs and a 150 be Viper and a 150 be Dragon. Once they are painted, he has received that level of ammunition. If TOWs are red and 200 rounds are going to be TOWs, they get painted red and are treated as TOWs from then on.

OCs look to see that the correct number of red ATWESSs are on any given vehicle. For example, an ITV can carry twelve rounds: two in the turret and ten in the racks. If we find more than twelve rounds in an ITV, we confiscate the ammunition. If a deuce-and-a-half is loaded with more rounds than can be carried, we confiscate the ammunition. We force units to haul the ammunition realistically. Ten boxes of ATWESS' can be put in a quarter ton, but that many TOW missiles couldn't be put in that vehicle.

We use paper ammunition for Stinger and mortar ammunition in force-on-force. If the commander wants to use the battalion mortars to smoke and wants to build up his smoke capability, he requisitions ammunition. A piece of paper will say, "I am a box of 4.2 smoke." To resupply the 4.2 platoon, two five-tons might come rolling up and all they have in the front seat are a stack of these cards. In actuality they would be loaded with 4.2 ammo. The paper ammo is put in the FDC. If he fires twelve rounds of smoke, our controllers pull twelve of those cards that say, "I represent so much ammunition." When the paper runs out, he has run out of ammunition and must request additional. It has to be hauled up in the appropriate manner.

Question: Is artillery included?

Right now, no, in force-on-force. When we get the Artillery OC team in, they will do that. We will have somebody down at those batteries at least during the first four days when the artillery is supporting. But we are not doing that now.

MILES

We reset the MILES on weapons based on how much ammunition there is. This is also true for the attached helicopters. The aviation OC is looking at the weather and looking at what an ACL might be. The aviators say, "We would go forward with x number of TOWs and x number of rockets and mini-guns." The OC makes sure that load is realistic based on the weather and sets the MILES accordingly.

National Guard

Question: What lessons learned specifically apply to the National Guard?

I don't know how National Guardsmen do it. All of them have a job that they devote much of their time and energy to. All of them have wives and families or roommates and sweethearts that they devote time to. When I do those two things, I am out of time. Yet they manage to take on a third endeavor of being professional soldiers. It isn't one weekend a month for ninety percent of them, it is a whole lot more. It is other weekends that they don't get reimbursed for. It is a lot of time at home and it is a lot of arranging their schedules. We are being well served by the National Guard.

Performance at the NTC

My second overriding impression is that they are a whole lot better than I thought they were. The experience of the National Guard has been similar to active units. The initial Guard that came to the NTC had more problems than they are having now because they didn't have all the lessons learned. They were not as well prepared and there was not as much focus on doing the right things. The lessons learned in the active Army have been passed to the National Guard. We have seen an increased level of preparation from everyone that has come since the initial two or three battalions.

We have found we have over-sold how much maneuver training, with every soldier in the field, we must do to prepare. This is particularly true at the task force level. This could be an important lesson learned for our Army in Europe. From the way the National Guard and some of the battalions or divisions that have very restricted maneuver space perform at the NTC, there are a lot of other ways of training. That says a lot about our capability to get a National Guard unit up to speed. They still have the problem that six months of active unit time is twelve days of guard time, based on the number of training days. The difference in performance, however, does not equate to the difference in time available. I would expect a great difference between what a National Guard battalion can accomplish and what a regular battalion can accomplish. However, I see some very comparable types of performance going on. I think we can learn more about what those activities are that make the most sense and how best to use limited periods of time.

The affiliation program has also been a big factor in terms of their capabilities. The Regular Army cadres spend a great deal of time working with the National Guard. If the Regular Army officers were working in their own units, the National Guard wouldn't be getting this advice and the active unit would be getting a whole lot more focus from his own leadership. There is a significant price paid by our active units to execute the guard training mission.

The ability of a staff to train in the armory is significantly enhanced with the CPXs. They are doing a whole lot more JEEPXs [JEEP exercises] where they get out on terrain in jeeps. There is no question that they can build their Task Force staff and they are. They have the capability of training and focusing at the platoon level. They have the capability to focus on individual skills.

Problem Areas

A big drawback that all the National Guard units have faced is poor maintenance procedures. They have full-time personnel to maintain their equipment. The National Guardsmen use it and then turn it in. They are out for such short periods of time that they can fight through the maintenance problems. When they are finished training, they don't have to worry about it. So, the area in which they probably were strongest in the past is now where they may be the weakest. This includes both operator and organizational skills to maintain and recover equipment. They have tremendous problems in doing that.

A continuing problem is physical conditioning, but part of that is being solved by tougher standards. We had a National Guard battalion on a recent rotation that took this approach: "You volunteer twice for the Guard. You volunteer once to sign up, but you volunteer again to get into the kind of physical condition that you have to be." They are doing a lot to make individuals understand that is a part of the unwritten commitment. They are enforcing weight standards. They are weeding out some of the personnel that will not make that commitment. Despite this, physical training and endurance is a real problem for the National Guard.

At the officer level the National Guard has very capable leaders. A continuing problem for them is NCO leadership. They are slowly, as the regular Army is, trying to face that problem. They have a lot of old NCOs that are hanging on for benefits and stay well beyond the period of time when they are most productive.

That is compounded by a second problem--they usually all come from a small community. In many cases, subordinates within a unit are bosses five days of the week. They have to approach discipline a little differently than we do. When I was a lieutenant, I was talking to a National Guard company commander. He said, "See that guy over there washing those pots and pans? The first sergeant and I work for him in civilian life. We have to approach discipline a little differently." Enforcing standards is a major problem for the Guard. They feel that they must elicit a consensus for most of the things they do. Although they are getting a whole lot better at making things happen.

The last National Guard battalion commander we had called all of his men in and laid out the training program that he thought they had to begin in order to come to the NTC a year later. It included extensive time that some could be reimbursed for, but most could not. He told his company commanders and key staff, "If you are not willing to make this kind of a commitment, you have until next week to tell me. The only people that are going to stay in this organization are ones that are going to make this commitment." He ended up turning over some of his leadership because of people that just either could not or would not put that level of commitment into training for the next year. This commander sold medical supplies and one of the people he let go was one of his biggest customers.

The dedication of those leaders and the ability that they bring to the battlefield, based on the amount of work they do in preparation, is phenomenal. National Guard Battalions are doing as well as many active Army

units when they come to the NTC on a regular basis with the exception of the problems that I just mentioned.

Home Station Training

Question: What can be done during home station training to better prepare for the NTC?

Collective Training Standards

The biggest job is in determining the standards for collective training for units. They are based on the results of our weapons. For years, we had no way of measuring success or failure on the training battlefield. With engagement simulation, i.e., SCOPES, REALTRAINS and MILES, we have that capability. The standard for a mission has to do with whether the unit successfully accomplishes their mission and how many casualties are sustained. That is the bottom line for our business. We are given a mission to accomplish without sacrificing any more than we absolutely have to. The goal, of course, is to maintain continuous combat operations where we attack and are prepared to attack again given some reasonable time to refit, rearm, and plan.

There is no reason why, for training purposes, we can't come up with a percent of friendly casualties that we would be willing to accept. We know that in combat, with a high priority objective, we might be willing to accept higher level casualties. Certainly there are also conditions under which we could accept very few. During the wind-down in Vietnam, the number of American casualties risked in an operation was a major factor in whether that operation was conducted. For training purposes, however, we could determine at what point a unit would normally be combat ineffective. There has been an effort between CAC, the schools, and ARI to work on that kind of data. It is important for us to come up with a standard that we are willing to put in our training exercises. We would then have something that everybody can train to.

In unit training, as in individual training, the amount of time we spend has nothing to do with whether we have met the standard. We must have a clear-cut, measurable standard. We may have a week to work in the field on certain missions. The standards may not be met on any particular mission when we finish the training period. There are always going to be limits as to how long we can stay out there, but at least the unit would know how close they were. They would know where they still have work to do. They are not saying they have completed training at a particular level simply because they have completed a week's effort.

In the preparation and in the planning stage, standards are, of necessity, more subjective. For example, whether everybody understood the OP order is somewhat subjective. However, if we had two or three key questions to ask subordinates, we would have some pretty objective information about how well the order was understood. There are ways to get a little more objectivity in making those decisions.

It is important to have an overall mission standard and standards attached to the major tasks. If we want to break down that mission to train then there is some objectivity at the task level as well. This helps in knowing where we are and for programming our resources. The standard does not even need to be mentioned in the AAR to get the feedback. I don't have to say, "We failed to accomplish the mission today because we lost fifty percent of our men and did not take the final objective." If somebody thinks that is important it can be said, but the important thing is why those results occurred. That is where some "checklists" are important. These are, in almost all cases, going to be some statements out of doctrine to help to develop the reasons why that task was or was not accomplished.

If we have a document with tasks, measurable standards, and backup checklists, we have one that is extremely useful to measure the units' progress in some very objective terms and which will help people doing observation and training. A document like that meets the real intent of the ARTEP which has never been fulfilled. I think we are close to making this happen. I am not sure we are close to convincing the schools that is the way it ought to look, but that is the way it ought to look.

There really are few differences in units. For years, we talked about the necessity of tailoring our training to build on the strengths and weaknesses. It is amazing how much all units look alike—from ranger battalions to National Guard squads when they initially begin to train in a MILES environment. I do see differences in how fast they improve. As elements of performance start to improve, they build in a very predictable way. They just get built a lot faster in some units.

MILES

MILES is the absolute key to training in a battalion. We need a lot more gear than we initially bought in the Army. Part of the problem is queuing up to try to get equipment. In the combat arms, when we get beyond planning and movement techniques, we are out of things that can be done without MILES. If you run any exercise where contact is going to occur between two opposing forces and you are not using MILES, you are negligent in planning and conducting the exercise. Without that simulation, a false sense of what is real occurs immediately. Everything that happens is unrealistic and the feedback we give is false. We train people how to get killed.

We should train with MILES the way that the MILES book lays out. It has stood the test of time in terms of procedures. There are very few things that we do differently at the NTC from what is in those books about how you put the gear on, how you plan for exercise and how you conduct it.

Leader Training

Everybody doesn't need to be in the field to build leader skills. One of the weakest links in company-team-level training is the absence of leader's reconnaissance. The commander can take his platoon leaders forward, in either a TEWT (Tactical Exercise Without Troops) mode or terrain walk, to issue the order where he can see where they are going to conduct the mission. Or he

takes them to the defensive perimeter before he finishes his order to start to put in the weapons positions. It is a very valuable technique and can be done at any level. Take a piece of ground, lay out a mission, and have subordinate leaders organize the ground. Have them to walk through how they would organize an attack including where they would deploy. Ask each of those leaders to review the factors of METT-T (Mission, Enemy, Terrain, Troops, and Time Available) to produce the part of the plan that he developed. There are a lot of things that can be done with leaders to conserve the precious amount of time with everybody in the field and get the most productive use of it.

Drills

Another thing that can be done at the team level is to use drills. If I understand what Fort Knox has done, they are going beyond drills to what they call situational exercises. These are a little more complicated. They may incorporate some drills but it is a small piece of the battle. That is a valuable way of looking at things.

Before we go into a full series of exercises where we give a complete OP order, move, deploy and attack, we can just practice the assault. Let's say we have a wood line, a rifle platoon in an assault position, an objective, and an OPFOR with at least one machinegun. We can say, "We have an attack. You have moved to this position. Your platoon is going to deploy and, right there, we have made initial contact with the enemy." We can begin an assault. This assault would probably take about fifteen to twenty minutes. If we take an hour or so for the After Action Review, we can move to another part of the woods and go through this same drill again. We can conduct four or five assaults per platoon in a day. If we went through the process of an Op Order, movement, attack, and then the drill we would be lucky to do two of these exercises in a day.

One of the big problems is that units plan pretty well, they move well, but they can't transition from movement to assault. They don't do that well at all and it is an aspect of our operations that lends itself to repetition. Every rotation unit I have seen is weak on this. We are talking about a training strategy to get at that one weak point, how to build repetition, and how to make the best use of a short period of time. We are looking for pieces that we can break apart and train rapidly with many repetitions in the same training period.

Individual Skills

Another important aspect to home station training is individual skills. To the extent possible in collective training, we can identify individual skills where there are problems for future training--for example, masking and unmasking procedures. If we make note of that, that's a big help. Often, we lose information about what we need to work on. The Army's policy that individual training is the primary responsibility of NCOs is absolutely right. We don't ensure that our NCOs are doing what they can to train on these skills during breaks. We cannot get ready for combat if we have to sacrifice large periods of unit time to train on individual skills. We have to depend on the fact that our NCOs are taking care of that during periods while they are

waiting for something else to happen. Even in the best units in the Army, we have a lot of standing around and waiting. There is a lot of time for NCOs to do individual training.

We are not tough enough about making sure that they are doing it and having some system worked out to identify things we want to work on. Part of it is having NCOs tell you what they are doing. It doesn't need to be structured to the point of laying it out like a common task test where you say, "This is the skill we will all train today." But some of the questions I might ask the platoon leader or platoon sergeant are, "What was the last skill you worked on? What are you going to do the next time you get a break? Or, why aren't you doing something right now? If I told you to get going right now, what would you do?" If he can't talk about what he would do, or how he would be organized to do it, then that is part of the reason it is not being accomplished. If we don't get a whole lot tougher with our NCOs to conduct individual training during time that isn't scheduled, we will not get it done.

Multi-echelon Training

In my experience, multi-echelon training only looks great on paper. At the task force level, we might have a squad accomplishing squad-level training and the task force staff involved in the CPX and both of those activities can be executed well. If the two levels are separated that far, we might be satisfied with the results. My guess is we wouldn't. For training to occur, somebody has to plan it, control it, and evaluate it. That needs to be the chain of command. If we are doing a CPX at task force level, and we don't have company commanders involved, it may not be a worthwhile exercise. If squad training is being conducted, platoon leaders may be controllers and give the After Action Review, but squad training is probably going to require company-command-level supervision, at least to organize, supervise, and lay it out. Even when you separate that far in an organization, we put too many demands on some key people's time to make both events occur and be well supervised, well evaluated, and well controlled. I don't think it can be done very well concurrently.

We need to prepare sequentially, by levels. I don't think that the argument of peaks and valleys means anything. The argument for multi-echelon training is that we are sustaining a pretty even level of proficiency at all levels at all times. I don't think so. We can't do that much and do it well.

Question: Would you comment on what can be done at home station to integrate all of the task force elements?

We have to look at each level, the techniques available, and separately train as many of the tasks as we can. The task force staff can practice with a CPX. It is easy to spot the staffs that have drilled Op Orders, trained with Pegasus or a TEWT--that have really drilled putting an order out, not just the planning, but completing and documenting the order. Those who have practiced come to the NTC and do well from the beginning. You see other staffs floundering with some simple techniques that need to be mastered. They waste many hours--the ammunition doesn't arrive, they didn't recon the route, they didn't know that it would take two hours to move from the LD to the objective, and so on.

Planning

The major point I want to make about home station training is there aren't any standards regarding how well we execute the training exercise. Too often, I see units planning only days before they go to the field. The amount of time it takes to plan, construct, and supervise exercises is enormous. The only thing that cuts that down is when a unit does it frequently. The second time he conducts platoon-level training, a lot of experience exists on how to do it. The steps are all there but we conduct them more efficiently and more effectively. A lot of headaches they ran into the first time are now lessons learned.

Generally, we do not do a good job of planning, preparing, and supervising the training we conduct. We accept excuses for why we can't do it better, "They make me program my ammunition a year out. I can't tell what I'm going to do." We know we need a certain amount of ammunition to train. The fact that our range areas are being programmed well out should be an advantage. That gives us a piece of ground a long time in advance. If that changes frequently, we have a division problem that those assets are not being controlled. But on most posts these periods of time are being laid out well in advance. That eliminates another excuse, "Somehow, I didn't know where I was going to be." We can start programming way in advance.

We don't plan at high enough levels to resource something. A company can probably resource some pretty decent squad-level training. They cannot resource platoon-level training. It takes a battalion to do that. "Two levels above" is probably most true in the area of supporting training. The best ARTEP training in the Army that I am aware of is being conducted in the 1st Cav. Division. One reason is that it is a division supported operation from start to finish. Brigades simply cannot conduct an ARTEP of that magnitude well. The entire division staff is mobilized. They have a man whose principal job is developing and running the ARTEPs in the battalions. It does not cut the brigade commander out, but there are too many resources that are beyond the brigade commander's capability to task, particularly when you look at the division slice elements that must support the training and be part of it. A lesson learned is that the key resource in training is the degree that a senior commander two levels up is involved in it.

The NTC is showing what is possible in training. I like to talk to the units while they are there about, "Don't look at the instrumentation and those things that you don't have at home station. Look at the things we do that have nothing to do with being at Fort Irwin or a hundred million dollars worth of instrumentation." How we check out MILES, how we give After Action Reviews. Some of the OPFOR procedures are do-able at home station. Units need to practice all of those. There are a lot of things that go on in those exercises that are worthy of imitation.

If we are conducting squad-level training and if the platoon leader or company commander is not conducting the training and giving the After Action Review, it is wrong. Who better to conduct the AAR and to run the exercise than a leader's boss? Having another second lieutenant conducting the AAR is not the way to get ahead. If we want to set up a more formal evaluation situation with an OPFOR, then the evaluators might be upgraded beyond that. At battalion and brigade level, we might put together a team that is

particularly capable of doing that job. That is the only time where we should get out of the chain of command. It is a conscious effort to get some reliability and validity.

If we aren't planning training exercises with a detailed evaluation of the unit, we are also wrong. One of the things that hurt when we transitioned from the ATT to the ARTEP was that we made it optional when these exercises are to be conducted. In the old days, it was an absolute requirement that ATTs be conducted at every level at least annually. I was in a division several years ago and was talking to several platoon leaders who had been there for two years. In their memory there had been no squad training or evaluation and there was none projected. I am not talking about building a test again. I'm talking about periodic training where we are going to evaluate every aspect of the squads' performance on a series of missions. The squad leaders are aware of the event and it is a great motivational tool. A building block approach must be taken. I have no qualms with the training strategy of starting from the lowest level and working up.

There are more and more tools being made available. I don't know if we are spending enough time in our advanced courses on how to train. We have to fight to get time in the POI. Part of the problem is that officers don't know how to use some of the tools available. That may be the reason that some of them aren't being used.

COHORT

Question: Have any COHORT units gone through NTC? What are the implications of this kind of training for COHORT units?

They are very strong at the individual level but a weak link has been NCOs. There has been some concern with how the NCO cadres get appointed and trained. That is apparently a weak link. The unit is great in terms of working together, developing skills together, and have a lot of cohesion--all those things that we want out of COHORT. We need to take the next step of making them into real squads, platoons, and companies. There are two problems. In a normal unit, you have people that have been around awhile. In a COHORT unit, everybody has the same level of experience. Until they get some experience, there are a lot of people at the lowest level. There is nobody to turn to and say, "How do we build this fox hole?" If they haven't all learned it together, then they don't know it. The second problem is that the NCOs have not been the quality we would like to see. Once we build a little experience in the units that have had good leadership, they have been very, very good.

Night Training

Question: Would reverse cycle training or night training enhance performance?

You have to do everything at night--not just the tactical aspect. You need to drill Combat Service Support to work at night. You need to give an Op Order in the middle of the night--we conduct some night attacks. Movement--just road marching--is very important. A lot of success at the NTC is being

able to move a unit from point A to point B. Success in the night operations at the NTC hinges on the ability to get to the right place at the right time. In a daylight attack, many assaults fail even though units are positioned correctly. If you can get everybody where you want them in a night attack, you have a tremendous advantage over the enemy and are generally successful.

Redundant measures for navigation and command and control will make you more money than anything else. With the modernized equipment, thermal sights have been a real double-edged sword. A number of units have self-destructed with fratricides between the LD and the objective because one soldier opens up on another and two company teams destroy each other because one soldier didn't know that a friendly unit got 400 or 500 meters ahead.

Take Home Package

Question: Are units using the Take Home Package of Lessons Learned provided to them?

I have wondered what units do with the package we give them. How much is it being used? We are getting some feedback about what is good and what isn't, what is being used and what isn't. They get a written package that I described earlier and the tapes of all the After Action Reviews. One unit came back to the NTC twice under the same commander. They did very well the first time and extremely well the second time. That commander had taken the tapes and made an index where the various discussions and topics, by system, were. He could tell, for example, what sections dealt with artillery and what sections of each AAR were intelligence. He had reviewed all of those tapes a number of times himself. Every time he got new personnel on board he would give him those tapes and the index. He had them review every aspect of the battles at the NTC that pertained to their operation. They had taken apart the written take home package, had assigned specific responsibilities and built their training schedule based on it.

If we don't take time after training exercises to gather information that has implications for what we do next, then we are not doing everything that is necessary as managers. There is a tendency to launch directly into another activity as soon as we get out of the field. Commanders take little time for reflection or taking advantage of what they learned in the last exercise. Leaders have to find the time, even if they have to build it into the training schedule, to assess where they stand, where they go next, and what they need to change about what they plan to do in the future. That assessment has to be put into the cycle of how they manage training.

Question: Do units get the only copy of the tapes or do copies become available to other parties?

They get the only copy. There are two copies of the written package. One goes to the brigade commander, one goes to the task force commander. There is only one set of the tapes developed. They go to the task force. Once the task force has them, they are their property. We have to be very careful because of some problems that have surfaced in the past. An article came out in the Army Times with some privileged information. The take home package

that goes to a unit is labeled with their battalion and brigade. One copy of that take home package is sent to Ft. Leavenworth. That is sanitized to preserve the anonymity of the unit. You could contact some unit and ask them if they have some tapes that they would be willing to let you go through. They share them within divisions. There is a conscious effort to do that.

I have heard the statement, "The NTC has been really teaching soldiers to fight an OPFOR forty miles north-east of Barstow, California." This couldn't be further from the truth. What goes on at the NTC is the practicing of 100 percent of our doctrine. We do a METT analysis and come up with some specific tactics that we are going to use for this particular mission. At that point, we start to deviate from what a soldier in Europe might do. A good example is reconnaissance of an objective.

Our doctrine says to find out everything that we can about the enemy and mass combat power against an enemy weakness. This fundamental Army doctrine gets practiced everyday at the NTC. In fact, that is one of the most difficult things to accomplish there. At Fort Irwin, we cannot send a scout to look at the objective in daylight. There is very little cover and concealment. There are enemy security agents whose whole mission is to keep our scouts from doing that. So, during daylight, we try to get some OPs (observation posts) on the flanks on some high ground. There is a good chance that with binoculars we can see the preparations in the objective area. Then, in the hours of darkness, we try to move in and do detailed reconnaissance. In Europe, there are probably a lot of places we can get people around the objective as soon as we get the mission because of the nature of the terrain. The important fact is that at the NTC we are reinforcing the need to gather intelligence. The only thing that changes between here or Europe is the specific techniques of acquiring information.

After Action Review

Question: How do you do your After Action Review (AAR) process?

We start by insuring that we have the right person doing the job. He should be either the commander of the unit going through the training or somebody of that rank and experience. He must be more experienced than the person going through the training. We don't have a lot of time and resources. For us to fail to put the best qualified people evaluating the training is wasting the resources expended.

The second thing is we have to avoid drawing the wrong conclusions. There is judgement involved in the reasons why events occurred. If we draw the wrong conclusion, we may be providing inaccurate feedback. For example, a unit encountered the enemy and maneuvered to the right and was unsuccessful and lost a lot of people. We might say that the commander made a mistake when he decided to maneuver to the right. Let's assume that some better terrain and avenue of approach was open on the left. But if the commander was not aware of the enemy situation on the right flank, did not have a full appreciation of the terrain, and if he was well forward, but had not been able to see through his subordinates, then he made a good decision based on his

knowledge. The problem was he didn't have all the information that he needed. There is not a command and control problem. There is a problem of reporting intelligence. I suspect we could find somebody that saw the enemy or recognized the avenue of approach on the left and it wasn't reported to the commander. That is the problem we need to be attacking. Persons more experienced or higher in the chain of command are more likely to make those judgements correctly. Tough decisions need to be made about committing our best people to be in charge of those training exercises.

They need to review the doctrine. As long as I have been at the NTC, I will still look at the scenario and pull out FM 71-2J and review the section on the mission we are conducting. We have to prepare ourselves to understand the doctrine and review it constantly.

We need to select people that are particularly good at conducting a METT-T Analysis. We quickly get past the doctrinal concepts and into specifics of how a leader said he was going to accomplish his mission. As part of our training of leaders we are emphasizing METT-T Analysis. Leaders must understand what it is. If we tell a sergeant to load a truck, we could ask him to give the METT-T Analysis involved in loading that truck. We should be able to question any leader at any level and he should be very practiced at doing that. That gives a strong preparation to do the evaluation in the field.

If we have an ARTEP document as it ought to look, we have a piece of paper that lays out the standard and a list of considerations as to why that standard was met or not met. I'm talking about the T and E (Training and Evaluation) outlines. That provides focus for us. If we need to go beyond those outlines for the exercise we have developed, by pulling parts of the ARTEP to put together a document that is going to be of most use, then that's a step that we go through. That happens because the ARTEP is built on centralized tasks that we need to pull together. We don't want to thumb through a whole ARTEP.

Observation Phase

There are a number of sources for the observations for the After Action Review. There is what we see ourselves and what subordinate controllers or trainers see. At the NTC we have the instrumentation system and some analysts. The player units become a source. We ask them questions to find out what they knew, or we talk to them after the battle before we get into the After Action Review. We might have them tell us how much ammunition they drew and so on. If we have the document that structures how this mission is going to be laid out, it starts to focus us on what information we need to collect. Most units do that pretty well.

The most important point in the observation phase is that we have to take notes. As simple as that seems, too many people fail to do it. They say, "As soon as the exercise is over I can recapture everything I saw and everything that happened." In my experience, in the exercises where I have taken good notes, I feel comfortable in the AAR. Where I've failed to do it, I am just winging it.

The next step is to put ourselves at the critical point at the critical time. That becomes a little tougher in two-sided engagements because we have to do that without detracting from the tactical atmosphere of the exercise. If a squad is low-crawling up an objective, the last thing they need is a squad evaluator walking along in the middle of the squad. He is going to lose his credibility in a hurry. The first time he gives the squad away, something worse is probably going to happen than losing his credibility. We have to be at least one step more tactical than the soldiers we are with. If they are walking, we are stooping; if they are stooping then we are on our hands and knees; if they are on their hands and knees, we are on our belly. Any time a controller is seen out there, he is seen after somebody from the unit has been observed. That makes the job of observing a little tougher, but it is a golden rule. The number of observers we need can very well be a detractor if we are not careful.

When the exercise is over, we pool the information prior to getting the unit together. That's where the subordinate controllers come in and where we might probe the unit. For example, let's say a two-man team went out to scout the objective and got lost and we didn't have somebody with them. We might probe them and find out what happened. We may query people about how much ammunition they have left to see if ammunition was redistributed. There are a number of inputs that we may get from the unit while we are preparing. Usually it will be summarized at the end with a debriefing of the subordinate controllers.

Organization

Next, we have to organize our thoughts for the After Action Review. There are a couple of ways to do this. A standard way is to take the battle chronologically: planning, preparation, execution. That's the way we do it most of the time. It is very logical. There is another technique that we are exploring which can be done equally well. That is to take key events by operating system.

In any After Action Review we are going to end up editing information. There will always be more to cover than we have time, so we have to come up with a procedure to hit the key events. We might say, "The key thing that happened today was we didn't get good intelligence and we need to focus on that. There was no artillery support. There were great log packs last night. We had all of our class V and class III. We were topped off."

We come up with a series of key events and discuss each of them. We take the planning, preparation, execution at a system level. Either technique can be used. There aren't any guidelines that would drive you to do one or the other. If we are short on time, the system process is pretty attractive. If we have had to run a couple of exercises, or if it is an extended exercise where a number of things have occurred, that drives us to a system process.

There is a live fire movement to contact mission at the NTC that is almost 30 kilometers. There are three separate objectives and sets of obstacles. Rather than try to take this mission chronologically, I take each of the systems and roll up the things that occur on all three objectives in each of those systems. Those are some considerations for why we might use a key event

approach as opposed to taking things chronologically. I have seen it done well either way.

We must have a way to represent the ground. At the lowest levels, the ideal way is to conduct the After Action Review standing at the critical point where the battle occurred. The AAR might be a floating AAR. We might walk around the objective discussing various aspects of the battle. Obviously, that is the best terrain representation we can have. If we have operated over a long distance, an alternative is to get to a key piece of ground where we can see most of the terrain. Barring that, some kind of representation on the ground or a piece of paper where you can draw some pictures. Anything we do is related to the ground. A representation of that ground becomes a key thing.

Attendees

We have to have everyone at the AAR that needs to be there. At platoon level and below we can usually get everybody involved. In fact, at that level, we can even bring in the opposing force. There is a real advantage in doing that. Both sides can get training concurrently. We have the exchange between enemies that is not present after a real battle. It is a whole different source of information. We carefully consider who should be at the After Action Review as part of the training strategy. We include as many people as we can, even if we limit questions and participation to some key leaders. Others get the experience of listening. The danger is if we have too many it gets to be a free flowing discussion and we can get off on tangents pretty quickly. The cardinal rule of After Action Reviews is they have to be brief and we have to get to the major points. So, there has to be some structure. But, the more people involved, the better.

The problem is leaders that don't make it to the AAR. Platoon sergeants are too busy out chasing ammunition or something. We find a lot of excuses why everybody is not there. That has to be stopped. Before the exercise starts, we specify who will be at the After Action Review. At the conclusion of the exercise, the location and time will be established for the After Action Review. It will not start until all the people are present. It can be embarrassing because we have had two- or three-star generals waiting for a company commander. The brigade commander and the task force commander are standing there and some company commander hasn't shown up. The answer is, "I don't start until you get those people here." You have to have that kind of discipline because you will find every excuse in the world why key people don't show up.

Anyone that has been involved in the After Action Review process will tell you that in the complicated business that we are in, the learning occurs in the After Action Review. What we discover in the mission is just some obvious lessons learned. The real critical learning will surface in the After Action Review. Therefore we absolutely cannot afford to conduct it with key personnel missing. That has to be understood by all involved.

Presentation Phase

In the After Action Review, the key to the presentation process is getting others involved. The procedures that are written in the MILES books are exactly what we are doing. So current training doctrine for how After Action Reviews are conducted is right. The key to it is getting participation. Participation is important from two major standpoints. One, no matter how good we are as controllers, and how good our subordinate controllers are at reporting to us, we are not going to know one hundred percent of the information. We have a good idea of what happened and why it happened, but we can never be certain because we will never know what a leader knew when he made a decision. We are never going to be present for all the coordination that occurs. The way we get one hundred percent of the information is to have every key person that participated in the training at the AAR. Any gaps in our information can be filled in.

The real impetus for the After Action Review process was S.L.A. Marshall's books, his interview techniques, and the work he did in World War II, Korea, and Vietnam. He would interview survivors of the battle. He came up with some of the most detailed small unit actions that we have ever had in our historical literature. All he had to work with were the U.S. survivors. We have a cadre of people looking over this exercise from every stand point. We have the enemy. We have all the U.S. soldiers, whether they are casualties or not. Our capability to reconstruct an exercise should be almost absolute. That is one of the key reasons for getting participation. They help us fill in the gaps.

The second aspect is that we must institutionalize the learning; i.e., the lessons learned must be the unit's lessons. They must own the problem. They are part of the process which develops the reasons that the problem occurred. They are involved in developing the solutions as opposed to somebody telling them what the problem was, what the reason was, and how they ought to do it differently. In the latter case, they will walk out of that After Action Review believing that the problems and solutions are theirs.

Third, it is motivational, from both a negative and a positive standpoint. Having a mistake surface in front of peers and superiors can be painful. They also probably stick in your mind a little longer. Some will say, "It is not a good technique to critique a leader in front of his men. It will destroy his credibility." This couldn't be further from the truth. Soldiers at the lowest level know the boss screwed up. When a platoon leader takes the wrong turn and gets everybody lost, everybody knows the platoon leader screwed up. We are not hiding anything by whispering in the platoon leader's ear, "You really should have checked your compass before you made that right turn."

A lot of subordinates are one rifle round from taking over a leader's job. Not only do we need to provide them training on how to do their job, but they need to have perspective on how the leader does his job. They can quickly find themselves in that job. It also gives people a better perspective on why leaders need certain information. As we explore the process of how this leader goes about doing his job, it becomes obvious how important it is that the leader be told certain things at the right time. By discussing both the good points and the mistakes, everybody becomes more aware of how the leader functions and what is required for command and control to

work. For all these reasons, we should discuss every aspect of performance in the After Action Review. The negative aspect of having your mistake surface should never be more than temporarily embarrassing. If we have constructed the right atmosphere for training within an organization, that is never a problem. It plays on our ability to do better, but nobody is damaged permanently by making a mistake in a good organization. Making the same mistake a number of times should carry some penalty. The only way we are going to get better is to identify the weaknesses, get into them in detail, and find the causes. Everyone's mistakes have to surface.

The positive aspect is that we emphasize good performance. We won't take a long time because we spend most of our effort delving into the problems and weaknesses. When we get an individual or an element that has played a key part in the battle, then we reward them by mentioning them by name. The results are obvious. They are now being rewarded in front of their peers for that extra effort. The ones that put in extra effort become the heroes, not the guy that came up with the latest way to "screw over" the platoon leader. Both the negative and positive aspects of participation work to our benefit in a good AAR.

Whether we go through the battle chronologically or by taking key events, we are going to home in on the problem because everybody has to accept the fact that there was a problem. In the MILES environment that has become less troublesome than it used to be. Without MILES, SCOPES or REALTRAIN, we had a hard time convincing some soldiers that their assault wasn't too hot because they thought they looked pretty good. They are sitting up on top of the hill. In a MILES environment, if all of them become casualties before they hit the wire, there's not too much trouble convincing them that they have a problem with assault techniques.

Clarifying Problems

Clarifying the problem is still important. I have gone into After Action Reviews where I was convinced I knew what the problem was, and found out that I was on the wrong track. So we divert from our notes and get into the heart of the real problem. The next step is the detailed reasons for why it occurred. That is where it's confession time for people: "No, sir, I didn't go down and check all those machineguns," or "No, I didn't look at that target list before the sergeant transmitted it." If we get very detailed about the reasons something occurred, we don't have to spend a lot of time on solutions. They become pretty obvious. In many cases what needs to be done to fix the problem becomes so clear that a lot of time doesn't need to be spent on it.

The person that is running the After Action Review is structuring it and acting as a moderator. He insures that the major points are covered and leads the discussion in the right direction. He cuts it off when it goes off on a tangent or when we are not making progress. He is going to prompt and offer information in addition to what he has been able to pull from the unit. He summarizes frequently. For example, once a discussion is completed about a better technique for working stand-to, he summarizes why stand-to has got to be fixed.

He can call on a number of things, but the effects of the battle are good. "We lost six tanks in the task force based on poor security. We lost two tank platoons in the right flank because the OPs went to sleep." We use the effects to provide emphasis. Because of his superior knowledge and ability, he can lend some arguments to the discussion to emphasize a particular event that is being discussed. That's the role of the person running the AAR. Obviously, everybody does it a little differently based on their personality, but these considerations are true across the board.

There is only one time when we don't solicit participation. There are some things we do in the Army that are patently obvious. We dig fox holes. We maintain security, given the enemy situation. We clean weapons. We do PMCS checks on automotive equipment. When failure occurs in those areas, we have to recognize that we do not have a training problem, we have a leadership problem. We have leaders that are failing to do something that is absolutely basic. We have to treat that kind of problem entirely differently. We have to confront it head-on as a leadership problem. Therefore, we can dispense with discussion. We will say, "We had no overhead cover for foxholes in this platoon. We have been in this position for three days. There are bales of sandbags behind your positions. We lost twelve people to indirect fire. That is unacceptable performance. It's sub-standard. It's a leadership problem. Platoon leader, squad leaders, you have to fix it." We need to be that brutal. We need to make it clear that this is the way we are going to deal with these types of situations. We will never get to the next step of learning if some of these basic things aren't being taken care of by leaders. That is not something you whisper in the leader's ear off to the side; you do it right in front of everybody.

Having the chain of command involved in these After Action Reviews is the best thing that has happened to the Army. The National Training Center would not have had the impact that it has had in the Army had we gone along with a couple of suggestions I heard. For example, "Nobody should be allowed in the After Action Review but the task force commander and the OCs. We want this to be a pure learning environment, devoid of any pressure." This just doesn't work. We would be totally dependent on the task force commander to take every lesson learned and apply it. Some lessons are more expensive than others. Some require much bigger changes to the way we do business. There may be things that the commander doesn't have control over. He is only going to change those things that he signs up for voluntarily.

At the NTC, the chain of command was involved from the start. The chain of command was horrified to find out that some of the things they thought were being done very well, were not being done very well. It caused senior leadership to go back and restructure training programs. It also resulted in a lot more "heat" being placed along the chain of command to get a lot better. A division commander told me he went back to his division after their first rotation at NTC and called his G-3 in and said, "Bring the five year training plan." "Roger." The G-3 comes in with this document he can hardly carry. The division commander says, "Throw it away." "What?" "Throw it away. We have obviously been doing the wrong things." On the spot, they restructured the division training program. They had programmed a series of large exercises around the world and no time to train. That has happened in some manner in every division in FORSCOM. Divisions have completely restructured their training programs because the chain of command understood

that part of the problem was theirs. In fact, the good senior commanders signed up for most of the problems. Obviously, some blame goes all the way down the line, but it starts at the top. A senior leader starts to see where all the holes in his organization and his own efforts have been, but subordinates are also held accountable.

I cannot think of anything else that we would like to get evaluated on beyond the ability of our units to go to combat and our ability to train them to do that. I think all of us have confidence that if my boss gives me a reasonable amount of resources, I'm going to be able to do that. None of us should have any qualms about the Chief of Staff of the Army walking in and seeing any training exercise that we are involved in. If we have been given the resources that our senior leader should give us and if we have been doing our job, it is going to be obvious that we are doing the best that we possibly can. I have seen no senior leaders in the Army that don't recognize that, even when they know they still have a long way to go. It has been a very healthy thing to have the chain of command involved in those exercises. It isn't necessarily pleasant, but it's for the good of all of us.

Finally, in the AAR, we summarize the lessons learned and the key points. We focus on what the commander can do prior to his next exercise. He may be going to turn around immediately and conduct another one, or he may not have another opportunity for some period of time.

The last thing is obvious. There has to be some time limit placed on the AAR. Capability to absorb information is limited with fatigue and we have a schedule to maintain. The process of editing, getting to the key points, maintaining the discussion within reasonable bounds, and getting to the end in an orderly manner is critical. It can't be an open-ended process.

Key Events

Question: What criteria do you use in picking out the key events?

That's where doctrine helps. For example, let's take an offensive mission. I will know at the end of the planning phase whether they have any good intelligence. I know if they didn't have anybody close to the objective, they have no idea of what is up there other than what came down from higher headquarters. I know that this is probably a key event. I will start to focus on artillery because the chances are the artillery is not going to be very good. They will probably spread it all over the map and not mass at the right place.

Big flags go up when things don't happen. The commander goes into his orders, and paragraph three about the assault is totally confusing. It is obvious that I have three company commanders that aren't sure who is making the main attack, don't know who goes next to who, or who is behind who. Or we have two companies that are supposed to occupy subsequent positions in the defense and nothing was said about when they are going to pull out. Flags start to go up when these things are not covered in planning and preparation. Obviously if someone gets lost, that is a key event. A company never got in the battle because they were off in left field. That is one-fourth of the combat power that never got involved. It is not as tough as it sounds to determine key events. They leap out at you.

The problem is all the little things that are just below the surface in terms of importance. For example, there was no early warning in the defense, but we had pretty good reaction out of the crews. We only had one air strike and only lost two or three vehicles. Tomorrow, lack of early warning could be the key thing that caused them to lose twelve to fourteen vehicles. Yesterday, it was a minor problem. The minor problems of today can become major problems. But you don't have time to cover every single thing that is a problem area, particularly at task force level.

Question: Do you go over what happened in the particular battle as opposed to teaching doctrine generally?

Yes, I focus on what happened in the battle and then refer back to the doctrine that would reinforce that.

Task Force AARs

Question: How does this process work at task force level?

The process I explained works pretty well at squad, platoon, and company. Task force is a special problem because it is such a complicated environment. We have a staff, combat support, and combat service support units. A lot of things are going on that are much more complicated. We have controllers that are looking at various aspects of the battle. At the NTC, I have a fire support observer, an intelligence observer, an S-3 observer, combat service support observers, and company observers. I have to try to compress the debriefing process for all the observers that have the information that I need in as short a period as possible. I have to train them to talk fast and talk smart. I want more detail than I intend to cover. At the same time, I want them to have organized the key points. The normal time frame to prepare a task force AAR at the NTC is about four hours.

As part of my end-of-mission instructions, I will designate a point for the company controllers to meet me because I want to do this face-to-face. I will have already talked to them about the planning and the preparation of the battle. I cannot wait until the end of the exercise to do that. Either on the radio, or by driving to various positions in the battlefield, they will have already given me some feedback on the planning and the preparation process within each company. At the end of the mission, they will tell me a synopsis of the unit performance, summarizing key events. One of my observers might say, "No lateral coordination occurred between A and B company." I put that down as a minor point and later it turns out that was one of the key things. So I ask the observers to give me more information than I need.

At the end of the battle, I give each OC seven or eight minutes to discuss execution of the mission. I tell them when they come up that the clock has started. I have some real story tellers. I have some observers who, no matter what I do, keep me for longer than that. The goal is for them to tell me as much as they can to give me background about the key events that occurred. I go through that process with five company OCs. If the Air Force observer is there, I may talk to him.

Then I will go to a central location, close to the AAR van, where the staff observers do the same thing. They tell me what is going on in the mission and what the key events are. At that point, I start to build specific notes. I have preprinted cards, by system, that say plan, prepare, execute. We have already discussed the planning phase in the artillery. We will have negotiated the major points I plan to cover. He puts that on a planning artillery card. All the planning cards are one color. All the preparation cards are another and all the execution are another color. The artillery OC keeps that until the end of the mission, so I may see the card the second time we talk about the preparation of artillery and make some more notes.

Organizing my notes with these different colored cards helps to put the AAR together very quickly in a format where I do not have to do a lot of reorganization. I even have an order in which I normally discuss things. When I have finished debriefing an observer at the end of a mission, we have negotiated several major points that are going to be on that card. There are going to be a few cryptic comments that give me the information to back up the major points. For example, "Task force failed to gain timely intelligence prior to crossing the L.D." The bullets might be, "Scout platoon late deploying, got lost. The wind was too high for the GSRs to be effective. Key intelligence gained by a company patrol not provided to the S-2. Grid coordinates of major events were transposed." There will be a series of small phrases to jog my memory about what we felt the major reasons were that they didn't get good and timely intelligence.

During the After Action Review, I'm going to get into a discussion about that event. Other things might surface as problem areas, or one of the things I thought happened may not have happened exactly as it was relayed to me. Hopefully, I don't commit myself to bold statements that later prove inaccurate. Units will hang themselves if I don't make any hard and fast statements. One of the things I tell my observers is not to tell me something that isn't the absolutely verifiable. Or I will tell him to go back and check. I will ask them, "Are you sure? How do you know that?" I really drill them not to tell me anything that they can't personally verify. Otherwise, I will treat it as a question. I might ask the engineer, "Were you involved in the selection of FASCAM targets?" If he gives me the standard answer, "Oh yes, I was involved," I might ask him a couple of questions which would "hang" him if he is lying to me. It is very important to verify information because you don't want any false statements or something that you can't back up. It is always possible to ask questions. If there is a problem, it will surface.

About two hours after the end of mission, I will have completed debriefing all the observers. I then go to the instrumentation site where I build the structure to support the points that need to be made about training. A lot of people don't understand what the instrumentation is and what it does for us. I don't go to the AAR with a video show that I support with my notes. I go with information that is going to support what the observers on the ground saw as the key points. The analyst in our system has the ability to see some things that the controllers do not, so there is some information that can be brought to the AAR site by the analyst. By and large, however, the critical information that must be communicated at task force level comes from the observers. They can observe fatigue, the speed of the OPFOR, and a thousand things that impact on what happened. I spend an hour and a half building the

best sound and light show that I can to illustrate the points that should be made. There isn't any better way to show someone that his navigation was screwed up than to be able to show his unit steadily moving out of sector on that screen. I can tell him that and he may accept it, but if he sees his own elements moving off towards Baker, California, then it is pretty clear that he has a problem. So the job of the instrumentation is to pull things together to illustrate points rapidly and effectively.

In the planning and preparation phase, I talk about the systems one at a time. I talk about the intelligence planning, the scheme of maneuver, the fire support plan, the air defense plan, and the counter mobility plan. The cards that I have fall right in line. I don't have to do any reorganization. The same thing for preparation. I usually discuss it by system.

The execution phase of the battle is, in most cases, handled in a chronological manner. At that point, I do have to reorganize the notes because I have been given a string of things about maneuver, intelligence, fire support. They have to be organized on a time line basis. The instrumentation analyst and I develop how we are going to show the battle. It may be in snap shots or by running hyper or by zeroing in on a particular company. We may play some video that shows the foxholes, what the outcome was in terms of overhead cover, or how good the breaching techniques were. I pull from the execution notes and build a new set of notes which are in chronological order. At the same time, I'm making notes as to where I will ask the OPFOR to emphasize some things. He is also one of the people I debrief. At the task force level, we can't bring more than one or two representatives from the OPFOR into the AAR. At the company and platoon level, we are not able to do it at all because there is no way of predicting in advance what part of the regiment hit certain units. Even if we could, the logistics of getting them all back together are too much. At home station, though, they should get all the OPFOR at the After Action Review for platoon and company training because it trains both of those elements simultaneously.

For example, a couple of rotations ago the OPFOR entered the artillery net, weren't required to authenticate, and fired all the FASCAM missions for the battalion. Of course, they fired them off in the distance where they weren't going to cause them any trouble. In another case, the regimental commander was listening while a task force commander got on a net, thought he was talking secure, and talked through the whole scheme of attack. Another case is a positive example. A National Guard battalion's light discipline was so good that even though the OPFOR reconnaissance got into their area, they didn't see anything. The OPFOR commander thought they had stopped all of his recon well forward because the light discipline was so good that they didn't report anybody. By the time they could have seen something, the National Guard reacted to them. The OPFOR commander was able to reinforce that, "I went into this operation with only a plan based on the terrain because I didn't have a plan based on your position and potential weaknesses." He is valuable for reinforcing both good and poor performances.

The only problem is that I have an hour and forty-five minutes to conduct the After Action Review from start to finish. I really have to be careful about the number of topics that I cover and the amount of discussion. A lot of information falls out. The S-2 observer will come to me with a list of things he would like for me to cover. We will negotiate three or four major

points. I will tell him, "I'm not going to cover that." The SOP is that all of those points I don't cover are things that he will go back to the S-2 and discuss one-on-one. These observations aren't being lost. They are just not going to be presented at the After Action Review where everybody will benefit. The only ones that will hear it are the S-2 and his section. They will be pulled to the side before the next mission to go over those notes. It is also part of the written Take Home Package, even though it isn't part of the AAR.

You have to be a very quick editor in terms of what is important. I still guess wrong. Occasionally I really have to hustle to get done because I allowed too much discussion or I guessed wrong in terms of how much I could cover in a period of time.

Future Issues

Question: What about the future?

I have a job of building a future NTC in Europe. (Editor's note: At the time of this presentation, COL Word was on orders for Europe to establish an instrumented training center. He has since been assigned to TRADOC as Director, Joint Readiness Training Center.) The things that need to be done there are going to take time. It is probably going to be a year before anything occurs that will actually change anything in terms of training. It will be another two or three years before the other aspects of the program are in place so that it is any comparison with what happens at Fort Irwin.

Question: Can you train effectively at the task force level at Hoenfels?

We have some real limitations. It isn't going to be easy, but we don't have any choice until we get another area. There is consideration being given to other NATO countries for an area away from Germany where units might train, but that is years away. All engineer training and all aviation gunnery that used to be at Hoenfels is gone. All ranges, with the exception of a couple of small arms ranges, are gone. Steps have been taken to make it a pure maneuver training area and eliminate everything that would detract from that.

Every piece of ground that can possibly be used will be used. Around Hoenfels are a series of maneuver rights areas and we are going to try to get these selectively. We might start a regimental attack in a maneuver rights area. They might be road-bound initially but it would give them a way to get rolling. As soon as they cross into the maneuver area they could start maneuvering. Or we might have the unit TOC or trains slightly out of the boundary. We might have one battalion preparing a battle position defense at the same time a second battalion is attacking in another direction. Over a period of ten days we might give battalions five or six missions. We don't have the flexibility that we have at the NTC, but it is possible to give a semblance of task-force-level operations. It will not be as good as at the NTC. The intel game is not going to be as good. Some of the combat service support is going to suffer, but it is better than what is going on right now.

Importance of Components at Training Centers and Home Station

In looking at doing this, I had to take a look at what is going on at the NTC. If we assume that we have been reasonably successful, then look at why that is true. Everybody agrees that there are three aspects to the NTC. There is a cadre of trainers. There is a full-up, permanent OPFOR and there is an instrumentation system integrated with the MILES. I have asked many people the relative worth of those three elements. Sixty to seventy percent of the learning occurs because of the ability of the OC teams. Twenty to thirty percent is due to the OPFOR and their proficiency. Ten to fifteen percent has to do with the ability of the instrumentation system to reinforce the learning. The battalion commanders and members of the command group tell us that. In our operations, we are not just walking into the After Action Review and saying, "Oh, by the way, we have a problem here." We are working with the unit from the minute we start briefing them several months in advance. We are talking to commanders one-on-one, training as we go and, finally, have the After Action Review.

Units at home station are trying to construct, as nearly as possible, ARTEPS that look like what happens at NTC with extended operations, combined arms, MILES, OCs, and the After Action Review process. Obviously, there are things that they cannot resource at home station. They have difficulty getting the same level of competence out of the people that they use for OCs, even at divisions that have a policy that the observers are from the last battalion that went to the NTC. For example, if there is a unit coming out next month to the NTC and they are going through an ARTEP, the last mech battalion in the division that went to the NTC act as the OCs. They still believe the biggest problem is getting knowledge of doctrine and ability to conduct After Action Reviews. We can do things to make the average person pretty good, but people see that stable cadre doing that job as the overpowering major reason for the progress that we have made.

The OPFOR are a big contributor as well because they provide an enemy that, I am convinced, is more proficient than any we will face in combat. The Soviets do not have a regiment as capable as the one that we have at Fort Irwin. That is partly because they know the terrain and partly because we have command and control equipment down at lower levels. We have radios in every vehicle. Every soldier can read maps. The average Soviet regiment doesn't have those things. You might say that is not replicating the Soviets, but as far as I am concerned it is better, tougher, and as my new boss says, "It puts a mark on the wall that everybody has to measure up to."

Everybody sees the same OPFOR and it operates in a fairly standard manner. We construct operations in line with Soviet doctrine. They have reached a very stable point in terms of their proficiency. It stays fairly level because they have turnover to deal with. Those battalions don't have any special dispensation out of DA. They turn over people as quickly as other FORSCOM units. Units see the stable, standard, tough opposing force as being a tremendous boost to the training. We can generate the combat power that the Soviets can generate. It just can't be done as well at home station.

I operated for a year and a half at the NTC without any instrumentation so the process of learning goes on without it. It is enhanced with it, particularly if there is an effort to really integrate it. The four-hour time

frame is insufficient to integrate all the instrumentation. There are times we have missions where we won't conduct the After Action Review until the next morning or times where we have more than four hours. I am able to spend three or four hours instead of an hour and a half to two hours with the instrumentation analyst. We go back and fine tune it. We are able to look at more video, listen to more commo, and a more professional, effective package is developed to reinforce the training points.

The key to a good OC team is stability. It is also in recognizing that these OCs are in key positions in the Army. FM 71-2J was really fine-tuned, if not developed, at the NTC. The schools readily accepted that. Real lessons learned in heavy battalion operations are occurring every day at the NTC. When the final draft of that document was being coordinated, they came out to the NTC. To the credit of TRADOC and the schools, what we told them is in the book and it is really an excellent training document. It is important to have these OCs, not just because they are trainers. They provide a valuable service for the Army in lots of other ways. They comment on doctrine, equipment, and organizations. This has always been one of the purposes of the NTC. You are not going to achieve that with people doing this job temporarily or people that turn over in their job frequently.

It is important to get the right people from the start. All my company OCs have had company commands plus they have had a lot of experience. They are on the upper end of the scale in experience in the Army at that rank. Anything we can do to stabilize and to select the best possible people will benefit our training. There is a tendency to fill those slots with somebody that we can afford to release for a period of time and have them conduct training across a battalion or across a company. The argument for this is the more people they expose, the more will learn. That's true, but the need to have reliable, valid judgements overrides that.

The OPFOR is a much tougher question. At home station a dedicated OPFOR obviously isn't going to happen. There are places where the Cavalry squadron has been tasked to be the OPFOR on a semi-permanent basis. Otherwise, that task gets passed around. I question whether we need a permanent OPFOR below company level. It's more important to train both groups simultaneously. Our training time is so precious that when we conduct platoon attack training, we can work on squad in the defense at the same time. Some platoons are broken up and put into defensive positions. Both elements are receiving training simultaneously. I doubt if a Soviet squad in the defense is set up much differently than ours, and if it is, whether that makes a whole lot of difference.

An OPFOR makes sense at the task force level on annual FTXs where we put together a task force level operation of some days in duration. It is important to look at tasking someone to do that job across battalions. Someone that has this mission over a period of time is going to get better at it. He is going to present a more standard, viable enemy. He also gets a lot of training by doing Soviet tactics. He is getting more exercises than the units that are being trained. That is an advantage in areas like command and control where there isn't a lot of difference in how we operate. No matter how much we push him into the Soviet mold, he is doing a lot of things we need to practice anyway.

At the NTC, we are looking at those lessons learned that help us make correct decisions about the organization, equipment, and doctrine. Our doctrine used to say, for example, that NBC strikes were flash messages and transmitted over the unit's command net. Regimental attacks were always preceded with non-persistent chemicals, as the Soviets normally do. You have this string of NBC-1s coming across the command net. When you have three company commanders doing that right at the critical point of the battle, the enemy goes right by. It became obvious that is not the answer. The doctrine is wrong. We have to come up with another way of doing that. For example, get on another net and transmit the key warning that says only, "I have a nonpersistent agent in my area." Some procedures came out that make a lot more sense. Detailed requests follow later on another net.

There are a lot of examples of that kind. The need to beef up the Fire Support Element at the task force is another example. It is abundantly clear that we can't synchronize our artillery in a rapidly changing situation based on the people, equipment and concepts that we are currently using.

As part of the T and E package that we put together, there is going to be some data that will not be used for immediate feedback to the unit. It is data that will help provide insights over time. After each exercise, we provide instant feedback to the unit as part of the AAR; other information is going to be part of a package that will be retained in the files to provide data for lessons learned. When someone comes up with a burning question like, "How important has the TOW been in offensive operations?" somebody can go back to these exercises and pull out some usable information. Our experience doesn't start from the day that somebody asks the question. We have a backlog of information.

Instrumentation System

We have had some problems with the instrumentation system. We have MILES on all the vehicles and it is tied into a box with an antenna that transponds data out from the vehicle. All the vehicles are instrumented. A series of "A" stations throughout the area pick up this data. If three stations pick it up then there is a triangulation procedure and we know position location. It takes one station to pick up firing events. If somebody shoots at someone that information is collected in the instrumentation system on the vehicle and is transmitted. On two mountains we have antennas and a relay where the signals from these "A" stations are transmitted down to the main computer facility. The analysts watching the screens are watching the battle as it occurs. They build a package of video, commo and computer imagery data which is transmitted out to an AAR van in the field.

The problem is that vehicles go down in gullies and disappear from view. The minute one of three "A" stations required can't pick up a signal we lose its position. If no station can pick him up, we lose the firing events. There has been a software problem in matching all these events. We are only batting 30 to 40 percent on firing vectors. There is the visual representation of a kill shot. We are batting 80 to 90 percent on position location for vehicles.

The Army has contracted through a civilian organization that was heavily involved in the development of the NTC to look at what is available now to upgrade the current instrumentation. At the NTC, we have a work station with a television screen and a little tablet with a pen to pull up information and to program information. Right now that is tied to a big room that has all the computers in it. I just saw a new prototype work station. The resolution on the screen is three or four times better than what we have at the NTC. It can pull up split screens so that you can look at a company action and battalion maneuvers at the same time. The engineers tell me that there are no upper limits.

Right now, at the NTC, we are limited to 500 players. We are limited in the types of computation and the way the data can be sorted and managed. On the new system, the engineers tell me they know of no limits.

Data can now be transmitted digitally to an AAR site. One of the problems at the NTC is that we transmit the information to the After Action Review van by microwave. The loss of resolution and tuning problems go away if we are transmit digitally. The cost of this system is less than what we originally bought. We are talking about tremendously increased capability, a lot smaller, and a lot less expensive to do a better job. Everyday someone comes up with some way to make it smaller and cheaper. There is a lot of competition in the industry.

The big Achilles heel of the NTC instrumentation is position location. Most of the problems are in the software which, hopefully, will be solved by advanced technology. Vehicles keep disappearing from view and NTC has no trees and a lot of barren landscape. There are global positioning systems that are going into the Army inventory in the next couple of years. However, nobody knows their reliability. The RDMS (relational database management system) at NTC requires line of sight. With the satellite supported RDMS system, and satellite "A" stations, the vehicles themselves become part of the instrumentation system. We may have a whole formation in the trees who transmit to each other and then one vehicle off on the side that can look up in the trees to have a system that can pull this information to the satellite. The big question is whether it really can do all the things that they say it can do. If it can, then we have an instrumentation system that will be a lot cheaper and much, much better.

There are also a series of digital entry devices that we are looking at that give the controller the capability to input information into the computer. More importantly, information can come back to him. It has a little screen. For example, if we are going to collect data to see if ammunition was redistributed, the controller can actually input the average number of rounds in the platoon after the exercise. We can pass the OPFOR scheme of attack to the controller. We have the capability of providing information both ways. There is going to be increased capability digitally to collect information. We don't have anything like that now at the NTC.