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UNITED STATES GENERAL ACCOUNTING OFFICE  
WASHINGTON, D.C. 20548

NATIONAL SECURITY AND  
INTERNATIONAL AFFAIRS DIVISION

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B-214047

MARCH 2, 1984

RELEASED

The Honorable Joseph P. Addabbo  
Chairman, Subcommittee on Defense  
Committee on Appropriations  
House of Representatives

Dear Mr. Chairman:

Subject: Impact of the Army's National Training  
Center on Improving Individual Soldier  
and Unit Abilities (GAO/NSIAD-84-51)

This report, presenting the results of our survey of the Army's National Training Center (NTC), responds to your May 10, 1983, request and later discussions with your office. We also surveyed training at selected Army units before their NTC exercises and upon their return from the NTC.

The NTC, established in 1981, gives individual soldiers and units the opportunity to train in an environment which closely parallels actual warfare. For the most part, the NTC exercises are far more realistic and demanding than home station training. Further, the NTC, through its various monitoring systems, provides evaluations which point out units' strengths and weaknesses. The training realism, intensiveness, and evaluation offered at the NTC supplement the training accomplished by units at their home installations. By the end of fiscal year 1983, 59 percent of the heavy infantry and armor battalions based in the continental United States had completed training at the NTC. This involved an estimated 45,000 soldiers.

Investment costs at the NTC amounted to about \$262 million through fiscal year 1983. The Army estimates total investment costs will exceed \$425 million through fiscal year 1989. Operating costs in fiscal year 1983 totaled about \$149 million.

In the long term, training at the NTC should benefit Army units as more officers, trainers, and soldiers repeat NTC training. However, some problems, if not corrected, could diminish potential NTC benefits. While the Army has initiated

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corrective action to deal with certain of these problems, we believe the following issues, discussed in detail in the enclosure, should be further examined by the Army.

- Use of some equipment at the NTC which differs from equipment possessed by some units at their home stations precludes performance evaluations on equipment the units would use in wartime.
- Training time and facilities are insufficient to correct deficiencies identified at the NTC once units return to their home stations.
- Possible systemic training problems have been identified during the NTC exercises.

In addition, the current investment costs for the NTC exceed the Army's original estimate by more than \$125 million, while the estimated number of units scheduled to rotate through the center annually has decreased by one-third.

We believe that Army management needs to address these issues so that benefits gained from NTC training can be increased. While we are not making any recommendations at this time, we are requesting the Secretary of the Army to comment on the matters discussed in this report and to advise us of any actions that are planned.

As requested by your office, we did not obtain official Department of Defense comments on this report. However, we did discuss our findings with headquarters officials at the Department of the Army, U.S. Army Forces Command (FORSCOM), and the U.S. Army Training and Doctrine Command (TRADOC), and they generally concurred with them.

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As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 5 days from the date of the report. At that time we will send copies to interested parties and make copies available to others upon request.

Sincerely yours,



Frank C. Conahan  
Director

Enclosure

IMPACT OF THE ARMY'S NATIONAL  
TRAINING CENTER ON IMPROVING  
INDIVIDUAL SOLDIER AND UNIT ABILITIES

BACKGROUND

The NTC, located at Fort Irwin, California, was established with the following objectives:

- to provide a place where Army units can undertake essential training that cannot be accomplished at home stations and
- to enable the Army to objectively measure the effectiveness and efficiency of organizations and weapon systems.

The NTC is a joint effort; FORSCOM has operational control, and TRADOC is responsible for establishing the instrumented battlefield, designing the training exercises, and evaluating the training results. The center, which became operational in July 1981, is designed to provide 2 weeks of intense combat training for brigades and battalions on a rotational basis. All heavy battalions--both infantry and armor--based in the continental United States will rotate through the NTC periodically. As of September 1983, 36 of 61 such battalions had participated in NTC training.

The NTC offers Army units some unique training opportunities and training evaluations which are not now available at home stations. First, the NTC provides force-on-force engagements against an opposing force consisting of about 1,000 men permanently stationed at Fort Irwin. Second, the NTC's isolation and acreage provide space enough to exercise modern weapon systems, electronic warfare, and close air support which can be provided from George Air Force Base, California, and Nellis Air Force Base, Nevada. Third, the NTC provides a place to objectively assess organizations, doctrine, weapons, equipment, and training through instrumentation. An instrumented battlefield collects audio, visual, and digital data from each exercise which is computer analyzed.

### Realistic force-on-force and live-fire exercises

The training we observed at the NTC consisted of both force-on-force engagements against an opposing force and live-fire exercises using moving targets. The opposing force was designed to replicate a Soviet motorized rifle regiment, and, as such, it outnumbered U.S. battalions by 3 to 1 in soldiers and equipment. Soviet tactics and U.S. vehicles modified to look like Soviet vehicles were used during force-on-force simulated engagements to make the combat training as realistic as possible. Offensive and defensive maneuvers were executed, giving the units an opportunity to perform critical tasks related to their wartime mission.

Force-on-force exercises were conducted using the Multiple Integrated Laser Engagement System. The engagement system, mounted on both equipment and troops, lets both soldiers and units know immediately if the enemy has scored a kill or near kill. Use of this system added realism to the exercises and provided a real-time assessment of casualties. It allowed commanders and soldiers to see immediately the results of their orders and doctrine applied on a realistic battlefield.

The NTC training of units we observed included 14 intense days of exercises, conducted both during the day and at night. This extended period required the units to demonstrate sustainment capabilities. In order to sustain, they had to provide full logistical support under realistic combat conditions. This logistical support included performing maintenance in the field, evacuating casualties, and living in a bivouac area.

### Instrumentation provides real-time analyses

Data from the instrumented battlefield was gathered from several sources. Audio data was acquired by monitoring the radio nets to help determine what happened during the exercises. Video data was obtained from a stationary camera atop a mountain at the NTC and eight mobile cameras. Digital data was provided by the computer system which is tied into the laser-based engagement system and the live-fire targets. In addition, about 30 controllers/observers watched and recorded events during the exercises.

Data from all these sources was used to give the units immediate feedback after each exercise in the form of after-action reviews. The data was then analyzed and summarized to provide the units with take-home packages, which included:

- video-taped summaries of the debriefings covering the units' NTC performance after each exercise,
- map overlays of the movement/maneuver of the units on the battlefield during the various exercises, and
- diagnostic results to be used as a basis for evaluating the units' past training program and to address their home station training needs.

#### OBJECTIVE, SCOPE, AND METHODOLOGY

Our primary objective was to assess the NTC's impact on identifying and correcting unit performance deficiencies. To do this, we observed the following aspects of the NTC training cycle:

- training received by soldiers in preparation for the NTC exercises,
- feedback provided by the NTC on individual soldier proficiency and unit proficiency, and
- use of NTC exercise results in subsequent training.

We visited the headquarters commands responsible for the NTC to discuss their oversight roles. These included the Department of Army, Washington, D.C.; FORSCOM, Fort McPherson, Georgia; and TRADOC, Fort Monroe, Virginia. We selected the 1st Infantry Division at Fort Riley, Kansas, as a case study to follow through the NTC training cycle. Within the 1st Infantry Division, we visited the 2nd Brigade's armor battalion, its mechanized infantry battalion, and various support units slated for NTC training.

We visited selected units before the NTC exercises to gain an understanding of their preparatory training. We then observed the training at the NTC and then afterwards returned to Fort Riley to determine how the lessons learned at the NTC would affect future home station training.

In addition, we visited the 24th Infantry Division of Fort Stewart, Georgia, 4 months after completion of its NTC exercises to determine how it had incorporated the lessons learned into its home station training.

We did our work from July to October 1983 in accordance with generally accepted government audit standards except that we did not obtain official Department of Defense comments on this report.

#### PREPARATORY TRAINING WAS INTENSIVE

Preparatory training for the 1st Infantry Division's 2nd Brigade at Fort Riley began in January 1983, 7 months before its scheduled NTC training.

The preparatory training was a building process, integrating both individual skill and collective skill training related to the brigade's wartime mission. Field exercises were held at the squad, platoon, company, and battalion levels. Finally, each battalion and its combat support and combat service support units trained together against an opposing force.

According to brigade and division officials, the training which the 2nd Brigade undertook in preparation for the NTC was more intense than it otherwise would have conducted. For example, the field exercises it conducted lasted an average of 8 days rather than the normal 3 days. The 8-day exercises required the units to demonstrate sustainment abilities. Also, during preparatory training the brigade was isolated from other routine commitments, such as supporting reserve units during their 2 weeks of annual training.

Other units of the 1st Infantry Division also engaged in intense preparatory training. For example, one of the cavalry squadrons was trained in Soviet tactics by the Army's Red Thrust team from Fort Hood, Texas. The squadron fought as the opposing force during force-on-force simulated engagements conducted by both the armor and infantry battalions.

#### STEPS BEING TAKEN TO EXPAND OBJECTIVE EVALUATIONS

Most brigade elements which train at the NTC already receive objective feedback on their performance. For those elements-- indirect fire (artillery and mortars), air defense, and aviation--which do not currently receive objective feedback, the Army has initiated actions to improve performance evaluations. Other elements, however, trained on equipment at the NTC which they did not use at home stations. Use of the different equipment denies these elements objective feedback on their ability to perform on equipment they would use if deployed for their wartime mission.

The current system for evaluating indirect fire is primarily subjective. An objective system--Simulation of Area Weapons Effects System--which could be linked to the NTC computer complex is now in the conceptual stage. Research and development dollars, according to TRADOC officials, are needed to develop the technology for this system. TRADOC plans to ask the Department of the Army to provide reprogrammed funds for this project in fiscal year 1984.

A system designed to measure the effectiveness of air defense and aviation units--the Air Ground Engagement Simulation/Air Defense System--has been funded by the Army and should be fielded during the current fiscal year. This system will be used throughout the Army, and at NTC it will be tied into the instrumented battlefield through the computer complex. While the initial purchase of the system has been funded, an additional \$6 million is needed to adapt the system at the NTC. A TRADOC official told us that \$2.3 million is available for this purpose but that the remaining funds had not been approved by the Army for fiscal year 1984.

Units generally bring their own equipment with them to the NTC. A major exception is track vehicles, such as tanks and armored personnel carriers. The NTC provides the track-type vehicles used during the exercises. These vehicles are not always the latest equipment in the Army's inventory. As a result, some units use equipment different from that which they have at home stations. For example, radio operators trained to use a voice secure radio, mounted in their home station track vehicle, are provided an older model radio which is not voice secure, and tank crews from some installations use a range finder different from the one with which their home station tanks are equipped.

#### PROBLEMS AFFECTING HOME STATION TRAINING

The NTC exercises are identifying problems with home station unit training which appear to be systemic. Even though units preparing for the NTC have access to the results of previous NTC exercises, they are apparently experiencing many of the same problems as the units which preceded them. NTC assessments covering 10 brigades which had trained at the NTC as of November 18, 1982, showed that all 10 brigades had weaknesses in navigation, survival in a nuclear/biological/chemical environment, ability to fight at night, and ability to kill enemy targets.

Correcting these problems when units return to home stations has been difficult because:

--Units are not afforded training time to correct the deficiencies identified at the NTC.

--Personnel turnover is high.

--Physical training resources are lacking.

--An evaluation package provided by the NTC is too general.

Limited training time once units return from the NTC to their home stations defers or precludes the correction of many deficiencies identified at the NTC. During the NTC preparatory training period, the units we visited were insulated from other installation commitments, such as supporting reserve component training and guard duty. This allowed them to focus entirely on training. However, once the units completed the NTC exercises and returned to their home stations, they were tasked with other installation commitments so that another brigade could prepare for NTC training. At Fort Stewart, we found that 4 months after returning from the NTC, the armor and infantry battalions had not conducted training to correct most of the deficiencies identified at the NTC. Rather, these units had been tasked with reserve training support and guard duty.

Personnel turnover, due primarily to individual rotations and separations, in an individual replacement unit can also dilute the training experience gained at the NTC once a unit returns to home station. The armor battalion we visited at Fort Riley, for example, lost between 15 and 20 percent of the personnel who trained at the NTC the first month after its return to its home station. Similarly, the armor battalion at Fort Stewart lost, through personnel replacement, about 20 percent of its people the first quarter after it returned from the NTC. Accordingly, many of the soldiers and trainers who saw first hand the need for additional training had left their units before it could be conducted. According to a FORSCOM official, turnover rates of 20 percent per quarter are typical.

At both Fort Riley and Fort Stewart, the personnel turnover rate in the armor battalions immediately following the NTC rotation was accelerated because soldiers scheduled to transfer just before or during the NTC rotation were held over until the NTC training was completed. In contrast, the infantry battalion at Fort Riley was composed of companies which did not have individual replacement and, therefore, did not suffer from high personnel turnover. Under Project COHORT, a program designed to improve unit cohesiveness, these companies were kept together as a unit since initial entry training and will remain together throughout their first tour of duty. At FORSCOM we were told the Army plans to expand its unit cohesiveness program to other units.

Limited land area for training exercises and environmental considerations at the home station can limit the deficiencies which a unit can correct. For example, Fort Stewart does not have the maneuver room for several tank companies to maneuver at one time. As a result, the armor battalion at Fort Stewart cannot fully train as a unit for its deployment mission, according to the battalion commander. Further, according to TRADOC, civilian communities surrounding most installations prohibit the extensive use of gases which are needed for training in a nuclear/biological/chemical environment.

At the completion of NTC training, an evaluation package is provided to participating units for use during home station training. This package provides computer-generated exercise results and controller observations of the units' performance. In some areas, however, the packages are too general. Officials of the infantry battalion visited at Fort Riley after their NTC training told us they agreed with the deficiencies highlighted in the package. But they said the package offered no guidance on what training tasks should be stressed to improve the unit's ability. Similarly, we found that while armor unit commanders are now provided hit-kill ratios for their units' performance, no specific guidance as to what type of training should be provided to correct gunnery deficiencies is provided. The TRADOC NTC project manager told us that TRADOC recognizes the problem and has asked the Army Research Institute for assistance in developing standards against which effectiveness can be measured. He said input from the Institute should be available in the summer of 1984. Use of this input should result in evaluation packages which not only identify problem areas, but also provide guidance on the type of training needed to correct deficiencies.

NTC COSTS RISING WHILE TRAINING  
CAPACITY IS LESS THAN PLANNED

The Army underestimated the investment dollars needed to establish and equip the NTC by more than \$125 million, while at the same time it overestimated the number of units that could train annually by one third. During appropriation hearings on the Army's 1982 budget request, Army officials told congressional subcommittees<sup>1</sup> that for an investment cost of about \$300 million, 42 battalions could train at the NTC annually. This

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<sup>1</sup>Hearings, Subcommittee on Military Installations and Facilities, Committee on Armed Services, House of Representatives, March 26, 1981, pp. 372 and 374. Hearings, Subcommittee on Military Construction Appropriations, Committee on Appropriations, House of Representatives, March 19, 1981, pp. 228 and 232.

estimate has escalated to over \$425 million, and now the Army estimates that 28 battalions per year is the maximum number of rotations, i.e. units that can be trained, with the current facilities.

With respect to investment costs, the two largest elements are construction funds (estimated at \$248.3 million through fiscal year 1989) and training developments--consisting primarily of instrumentation and the computer complex (estimated at \$118.5 million through fiscal year 1985).

NTC operating costs for fiscal years 1982 and 1983 are shown below.

	<u>FY</u> <u>1982</u>	<u>FY</u> <u>1983</u>
	----- (millions) -----	
TRADOC Operations and Maintenance	\$ 1,317.8	\$ 1,669.0
FORSCOM Operations and Maintenance	56,597.2	57,656.8
Reimbursement for Troop Rotations		10,000.0
U.S. Army Communications Command	1,404.5	1,485.8
Medical Activity	2,640.3	2,992.5
Family Housing	2,664.0	4,937.1
Military Pay & Allowances (Fort Irwin permanent party personnel)	39,845.2	44,280.9
Stock Fund	<u>28,245.8</u>	<u>25,975.0</u>
<b>Total</b>	<b><u>\$132,714.8</u></b>	<b><u>\$148,997.1</u></b>

We were told by FORSCOM and TRADOC officials that more resources would be needed to increase the number of rotations per year. Fort Irwin has enough land, and the computer complex has the capacity to handle more instrumentation; however, more equipment, more controllers, and a larger opposing force would be needed, according to Army officials, if the number of rotations per year were increased. Increasing the number of permanent party personnel would also increase the need for more barracks and family housing.