

# NUCLEAR WEAPONS EMPLOYMENT TRAINING

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**T**HE training of officers in nuclear weapons and their employment has fallen far behind technological advances in the nuclear field. Over 14 years have passed since the first combat use of nuclear weapons. It has been seven years since the Army achieved significant nuclear delivery capability. Yet today, such a small percentage of our Army officers have been trained as nuclear weapons employment officers that thorough and critical analysis of the policies and procedures pertaining to nuclear weapons training appears warranted.

The War Department plan for the "complete integration of atomic energy instruction into our training and school system" was outlined at the Conference on Atomic Energy held in Washington in 1946. The instruction was to be divided into three general phases:

Phase I.—Orientation of senior commanders and War Department planners.

Phase II.—Training of instructors at major commands and service schools.

Phase III.—Instruction of personnel throughout the Army and planning for additional training as needed in the future.

Phases I and II were completed in 1946. Phase III was never initiated. This probably can be attributed to:

1. The "civilianization" of the entire atomic energy program which began in 1946.

2. The organization of the Armed Forces Special Weapons Project (AFSWP), and assigning to it the responsibility for train-

ing individuals and units for all services.

3. Continued national emphasis on the production of strategic rather than tactical weapons.

4. The absence of Army controlled nuclear delivery systems.

These factors also tended to downgrade the Army's position in the nuclear field and contributed to the general lack of urgency for nuclear weapons training.

From 1947 to 1952 the AFSWP training program, in which the Army participated, constituted the primary training effort in the nuclear weapons field. Few individuals and units of the Army were trained by AFSWP. This could be justified on the basis that the Army at that time had no nuclear capability and, therefore, required only a small number of trained personnel. In addition, the curriculums of Army service schools did not include adequate nuclear weapons instruction; they contained fewer hours on nuclear subjects in 1952 than were prescribed in 1946.

In early 1952 at Sandia Base, New Mexico, the AFSWP initiated a nuclear weapons employment course (NVEC) designed to teach the data, techniques, and procedures necessary to employ nuclear weapons. Later that same year the first Army-run employment course was conducted at the U. S. Army Command and General Staff College. The Army course was patterned in detail after the AFSWP course and incorporated directly the AFSWP system of target analysis. The course was eight weeks long and was relatively technical with respect to the aver-

*Training of all officers in essentials of nuclear weapons employment can be facilitated by thoroughly integrating nuclear weapons instruction as a necessary and normal element of their professional education*

age officer's background and probable future needs. It emphasized the technical details of nuclear weapons and target analysis rather than the broad basic knowledge of nuclear weapons and their effects. Such a curriculum did much to engender the feeling throughout the Army that nuclear weapons employment was a technical subject, filled with pitfalls for the average officer, and properly a sphere for a modern-day specialist with his slide rule.

### Development of Weapons

The development of nuclear weapons and associated delivery systems progressed rapidly after 1952. By 1956 the Army could deliver nuclear weapons against an enemy with the *Corporal*, *Honest John*, 280-mm gun, and 8-inch howitzer. The number of employment officers available, however, was far short of that required to use the increasing numbers of nuclear weapons effectively. Additionally, a high percentage of the officers who had completed the NWECE were not assigned to tactical units or were too senior to occupy the personnel positions designated to be filled by trained employment officers. It became evident that our employment capability was being impaired seriously be-

cause the training program was lagging so far behind weapons availability.

The first substantial broadening of the nuclear weapons training program was planned for Fiscal Year 1957 when the United States Continental Army Command directed that selected branch schools expand their nuclear weapons employment coverage. The objective was to prepare combat arms officers, who were attending advanced level professional courses, to perform the duties of employment officers at division and corps level. This program was the first significant step toward training officers in sufficient numbers, at the right age, and while still in the right rank. Initially, there were problems such as the lack of adequate training literature, shortage of well-qualified instructors, and restrictions arising from security requirements. However, the program was successful and was further expanded for Fiscal Years 1958 and 1959. In Fiscal Year 1959 instruction was being presented at six branch service schools and the USA CGSC.

This review of past nuclear weapons employment training reveals that the training was essentially of a stopgap nature directed toward filling the urgent need for more employment officers. Little emphasis was placed on the broader problem of what employment training all officers should receive. Solution to this important problem requires that we take an over-all view of the training program to determine what training is necessary and how this training can be obtained.

### Level of Training

Employment training to date has affected officers at the advanced schooling level and above. The current program, which also affects this group only, is far more effective than any previous training effort. An estimated 2,200 employment officers were trained during Fiscal Year 1959, or about 40 percent of the number trained in all previous years. This

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rate of training for Fiscal Year 1959, if continued for three more years, should provide enough trained officers to meet the projected minimum requirement. This requirement, however, is based on a compilation of the number of staff positions designated to be filled by trained nuclear weapons employment officers. Thus it is a requirement only for employment officers considered as staff specialists. It does not include officers needed to fill the far greater numbers of command and staff positions where a high level of knowledge concerning nuclear weapons and their employment also is necessary.

### Present Concepts

Under present concepts the nuclear weapons employment officer, as a staff specialist filling a designated position, accomplishes most of the planning for nuclear weapons employment. For this procedure to be successful it must be assumed that the staff effort involved in the employment of nuclear weapons can be restricted to the few officers occupying these positions in each headquarters. This is not the case. Nuclear weapons have such an influence on operations that their employment requires detailed considerations by almost all individuals involved in the command and staff process.

Virtually all Army planning is based on a greater scale of use of nuclear weapons and control of these weapons at lower levels. These trends indicate that all officers assigned to a battle group or larger unit staff should be trained to employ nuclear weapons effectively. To meet this requirement, it is believed the training program of the future must have as its underlying objective the training of *all* officers in the essentials of nuclear weapons employment. This instruction should be regarded as a normal and necessary part of the officer's professional education, not a special subject for relatively few of the officers.

The preparation of officers for the em-

ployment of nuclear weapons can be facilitated by thoroughly integrating nuclear weapons instruction into the curriculums of the service school professional courses. At the present time the nuclear weapons instruction is presented in one block at the beginning or end of the course in four of the six service schools which provide employment training. This increases the tendency to treat it as a special subject. Also, presenting the nuclear instruction after the main portion of the professional course virtually eliminates teaching practical employment considerations during that part of the course. Much teaching value is lost under these conditions.

Integrating nuclear training in the professional courses generally requires that instruction in weapons, effects, and target analysis be taught near the beginning of the course. Normally, the most advantageous time for this is during the part of the course on staff procedures and techniques, since the end product of the basic instruction—target analysis—is a staff technique. The applicatory phase of the nuclear weapons instruction, which requires use of information gained in earlier instruction, then can be included in the tactical portion of the course which follows. Such an arrangement provides opportunity for ample application of target analysis procedures, and repetitive application is necessary for student learning.

If there is a "most" important part of the nuclear weapons instruction, it is attaining realistic, practical application. Integrating applicatory instruction into tactical exercises so that the student is required to use weapons and effects knowledge previously acquired and to apply target analysis techniques is difficult. It necessitates tight curriculum control, close coordination between the agencies presenting basic nuclear and tactical instruction, and many more faculty members who are trained employment officers. Such an approach will, however, pay rich dividends

in increased student understanding of the subject and should improve the student's ability to make logical decisions concerning the employment of nuclear weapons. This ability is the desired end product of the nuclear weapons instruction.

Officers from branches other than Armor, Artillery, Infantry, Chemical Corps, and Engineers have a difficult time obtaining nuclear weapons employment training. The only course such officers can attend is the NWECE and only a very small number can attend it. This lack of effective employment training is a big problem; its magnitude is indicated by the fact that officers from other branches constitute about 48 percent of the officer corps. A high percentage of these officers require knowledge of nuclear weapons employment for branch assignments in tactical units. All should have the training as an element of their professional education.

#### Expand Instruction

A limited amount of nuclear weapons instruction is included in the advanced level courses for the other branches at the present time. Expansion of this instruction at each service school appears to be the most practical and economical way of covering this void in training. The objective of the expanded training would not be to make a target analyst of each technical and administrative service officer, but, rather, to ensure that he has sufficient knowledge concerning nuclear weapons and their employment to perform his normal duties properly when the weapons are used. This requires fundamental instruction roughly comparable to that included in the current employment courses, with the applicatory phase emphasizing technical and administrative service aspects of the employment. Administrative service officers require less applicatory instruction due to the nature of their normal duties.

An important feature of any program designed to broaden the knowledge of nu-

clear weapons and their employment must be the desire of officers to gain the knowledge. Removing nuclear training from the specialist field and making it a practical, desirable subject is a preliminary step toward encouraging officers to train themselves. Self-teaching is an essential element of an officer's professional growth and is particularly applicable to this field. It is obviously desirable, but not essential, for an officer to attend a nuclear weapons employment course; he can train himself using the excellent current training literature available.

A large number of officers who have completed the advanced level schooling have not had an opportunity to attend an employment course. Since many of the senior officers for the next 15 to 20 years will come from this group, it is particularly important that they have adequate nuclear weapons knowledge—at least equal to that of the employment course graduates who will serve under them. This requires more than attendance at an orientation course or passing familiarity with nuclear weapons terminology. Designing and presenting a course especially for these officers is impractical. Many would not be available to attend such a course. Their needs vary greatly. Some have very limited knowledge of employment. Others—because of assignments, attendance at numerous short nuclear weapons courses, and previous self-study—have extensive knowledge in the field. The most practical way of accomplishing the training would be a positive self-teaching program monitored by a designated agency. Such a program would be more effective if supplemented by short supervised courses similar to the current refresher instruction.

#### Increased Requirement

Nuclear weapons for employment at battle group, or comparable level unit and lower, are expected to be available in large numbers within the next five years. The planned high density of these weapons

in tactical units and the lower level of control indicate that a greatly increased number of officers will make decisions concerning their use. Consequently, many more officers, including combat arms senior lieutenants and captains, must be trained to employ these small weapons and they must be trained prior to the time the weapons become available.

The requirement for training additional personnel has to be met by an entirely new training effort since present programs do not provide for training nuclear weapons employment officers below the advanced schooling level. It is believed the best method of accomplishing the training would be to expand the nuclear instruction now included in the company/battery officer course at the combat arms service schools and selected technical service schools. The limited amount of instruction presently taught in these courses is not designed to train personnel in weapons employment. The training required is that necessary to prepare the officer for employment of the small-yield weapons. This is a lesser amount than is necessary for employment of other weapons or for staff duty at higher levels. A sample training program is shown in Figure 1.

#### Noncommissioned Officers

Detailed target analysis is the principal feature of the staff procedures involved in nuclear weapons employment which is not an integral part of the decision-making process. Many elements of the analysis closely parallel current noncommissioned officer functions. Detailed target analysis is an appropriate noncommissioned officer function and one which likely will evolve in the relatively near future.

Noncommissioned officers, acting as target analysts, can reduce the over-all time required to place a weapon on a target by making the detailed analysis while staff officers are involved in the decision-mak-

ing part of the process. Noncommissioned officer analysts, if added to staff sections, could relieve employment officers of many functions they are now performing and permit them to concentrate on their primary duties. This would also increase flexibility of operation in normal times, and improve the ability to continue operations if hit by an enemy nuclear attack.

The training of noncommissioned officers as target analysts should begin in the service schools. The initial program should be both selective and on a modest scale. This training would require an expansion of the basic nuclear weapons instruction presented in the professional noncommissioned officer courses at the combat arms service schools. Emphasis should be placed on the techniques of detailed target analysis. A sample program is shown in Figure 2.

#### Training Literature

Training of personnel in nuclear weapons employment is closely related to the training literature available. The USA CGSC recently has made great strides in reducing the mass of effects data to a simplified and more usable form. Target analysis techniques and related procedures also have been made easier. All of these improvements have been incorporated in the training literature on nuclear weapons employment. For the present, the improved training literature permits teaching the effects and target analysis portions of the employment course in about the same time required to teach them in the past, despite the approximate tripling of effects data available in the last five years and the addition of several elements in the analysis of targets which were not previously considered. For the future, the simplified data and procedures, when further refined, promise relatively large saving in time and will make the material much easier for the student to understand. The improved training literature probably will contribute more

to the teaching of nuclear weapons and to simplifying their use in the field than any other development in recent years.

The time required to train a nuclear weapons employment officer has been re-

Trends indicate the training can be accomplished in still less time in the future. The nuclear weapons systems are approaching a height of complexity and, during the next two to five years, will

### OUTLINE OF EMPLOYMENT TRAINING FOR COMPANY/BATTERY COURSES

<i>Subject Content</i>	<i>Estimated Number of Hours Required</i>
Army Nuclear Weapons and Delivery Systems Characteristics, capabilities, and limitations of Army systems; functioning and practice firing of battle group support weapons.	20
Nuclear Weapons Effects Coverage of effects for each type burst; response of personnel and materiel to the effects; damage criteria; medical aspects; protective measures.	14
Radiation Monitoring and Survey, Fallout Prediction Procedures used in radiological monitoring and survey; practical exercise using detection instruments; radiological prediction techniques for battle group support weapons.	10
Analysis and Selection of Targets Techniques and procedures used in the analysis and selection of targets for battle group support weapons; troop safety considerations; analysis of own vulnerability to nuclear weapons attack.	12
Staff Procedures for Nuclear Weapons Employment Staff coordination and procedures; supply and control of battle group support weapons.	3
Tactical Employment of Nuclear Weapons Tactical exercises requiring the employment of nuclear weapons under varying conditions; emphasis is placed on use of battle group support weapons.	30
Miscellaneous Foreign nuclear capability; training techniques for using either classified or unclassified data; nuclear weapons procedures above battle group level.	10
<b>TOTAL</b>	<b>99</b>

FIGURE 1.

duced from eight to five weeks during the last four years. This reduction has been made in the face of an increasing number of weapons in stockpile and much more data concerning effects with which the student must become familiar.

begin to be simpler. Training literature not only is being vastly simplified, but also much more of it is available in unclassified form.

Expansion of the training effort in four areas has been discussed:

1. For officers who have completed an advanced course but are not qualified as employment officers.

2. In advanced level courses other than the six which now include sufficient employment instruction.

3. In company/battery officer courses.

period (next 15 years) the proposals outlined herein should require less total training than is necessary under our present system. The training will be started earlier in an officer's career. This, when combined with frequent application of the knowledge in normal training exercises,

### OUTLINE OF TARGET ANALYSIS TRAINING FOR SELECTED NONCOMMISSIONED OFFICERS

<i>Subject Content</i>	<i>Estimated Number of Hours Required</i>
Nuclear Weapons and Delivery Systems Characteristics, capabilities, and limitations of weapon and delivery systems with the emphasis on Army systems; detailed instruction on fuzing and delivery accuracy.	12
Nuclear Weapons Effects Coverage of effects for each type burst; response of personnel and materiel to the effects; medical aspects; protective measures.	18
Radiological Monitoring and Survey, Fallout Prediction Procedures used in radiological monitoring and survey; familiarity with detection instruments; fallout prediction.	16
Target Analysis Fundamentals of target analysis; techniques and procedures used in analysis; practical exercises in target analysis; troop safety considerations; analysis of own vulnerability to nuclear weapons attack.	40
Staff Procedures for Nuclear Weapons Employment Staff coordination and procedures; staff record keeping; internal functioning of staff sections for nuclear weapons employment.	6
TOTAL	92

FIGURE 2.

4. For selected noncommissioned officers of the combat arms.

On the surface this apparently amounts to the familiar plea for more, more, more training in the subject being discussed. It is believed that more training is necessary in the next five years since we *must* have an adequate number of persons trained to employ the weapons we now have and those we soon will have. Over a longer

will permit less formal instruction at the advanced level and above. As more of the material becomes common knowledge because of broader dissemination, less repetitious instruction will be necessary. The greatly improved training literature and simplified data and procedures also should contribute significantly to the long-range reduction of the over-all training effort.