CHAPTER IV
SAFETY PREECAUTIONS
SECTON 15
PREPARATION AND FIRING OF CHARGES

General

1501. During instruction and training in the use of explosive and during demonstrations the safety precautions set out in this section will be strictly observed. In operations these instructions will be followed as far as is practicable; in departing from them the officer in charge will remain responsible for providing adequate precautions against injury to our own troops.

1502. At every practice or demonstration with live explosives an officer will be detailed, who will be responsible for the practice and for the strict observance of all safety precautions. When an officer cannot be present a fully qualified JCO or senior NCO instructor may be detailed in his place, provided each charge to be fired does not exceed two pounds.

Danger Areas

1503. For every practice or demonstration with live explosives an adequate danger area will be established and will be guarded by sentries provided with red flags. Such sentries will be sufficiently numerous to prevent the entry of people or livestock into the danger area. In particular, sentries will be posted on roads passing through the area to stop traffic entering the danger area.

1504. The officer in charge of the practice will ensure that sentries understand their duties that they can hear or see the signals from the control point, and that the area is clear before charges are connected up.

1505. Danger areas for typical practices with high explosives are set out in Table 32.If adequate cover is not available for them, all troops taking part and spectators will be withdrawn from the danger area before any charge is fired. If natural or artificial cover is available within the danger area it may be for troops and spectators provided that it gives full protection against splinters and ricochets. In selecting cover due consideration must be given to the probable angle of descent and the size of fragments anticipated. Buildings in good condition will often provide adequate protection. It is particularly important that roof should be sound; damaged buildings should never be used.

Preliminary Precautions

1506. The following precautions will be taken before the beginning of the practice:

a. If safety fuze is to be employed, cut off the first 12inches of fuze and discard. Cut off the next 12 inches, ignite one end and note how long it takes to burn through to the other end. If this time does not exceed 33 seconds and is not less than 27 seconds, the fuze remaining on the coil may be taken into use. If the burning time is outside these limits the coil must be rejected. Every coil of safety fuze or remnant of a coil will be subjected to this burning test immediately before use. Every care must be taken to protect safety fuze from the effects of rain or damp. Safety fuze will be cut from the reel immediately before use, ie, lengths will not be cut in anticipation of use several days later. Odd lengths will not be allowed to accumulate and in no circumstances will any odd length (except the remainder of a coil) be put to use. If the seal of a new tin is found to be broken, or the tin damaged, the contents should be treated with particular suspicion. The minimum length of safety fuze to be used on any demolition will be 18 inches.

b. Exploders will be tested by the fusion test before use.

c. NCO with adequate assistants will be placed in charge of all explosives, detonators, etc, He will be responsible that they are not approached by unauthorized persons, that they are issued only as and when required, and that the balance is placed in a position of safety before the charge is fired.

d. Sentries will be posted and instructed in their duties; the danger ares will be cleared and closed.

e. All troops and spectators, as well as explosives, detonators, etc, other than those required for preparing the demolition, will be moved to a safe place.

f. Smoking within 50 yards of explosives during the course of the practice will be forbidden.

g. All personnel will be warned that, when the charge is fired, they must, if in the open, look upwards for falling fragments.

During the Preparation of Charges

1507. The following precautions will be taken during the preparation of charges:

a. The minimum number of persons will be employed.

b. No instrument of iron or steel will be employed for tamping or otherwise loading the charge. Force will never be used in tamping.

c. Neither detonators nor safety fuze will ever be buried, or put inside boreholes.

d. Detonators before and after attachment to fuzes and pending insertion in the charge will not be left unattended. All electric detonators will be tested for continuity before being incorporated in a circuit. A further test for continuity will be carried out and continuity obtained before detonators are inserted in the charges.

e. Every man as he can be spared will join the party at the place of safety.

f. When the charge is ready, all personnel, other than the officer or NCO detailed to fire the charge, will withdraw to the place of safety , to which all spare explosives will be sent.

g. Safety fuze, if used, will be of sufficient length to ensure that the firing party can reach the place of safety at a walk before the charge can explode.

h. Where several charges are to be fired separately by safety fuze, fuzes will be arranged to fire at intervals of not less than 10 seconds; in such cases, two NCOs or men will be detailed to count the explosions.

j. The officer or NCO detailed to fire a charge electrically will retain charge of the key of the exploder and will be the last man to leave the prepared charge before firing. The leads of the exploder must not be connected at this stage [see paragraph 8(c) below] With the DC exploder, mark 2, for which spare keys are carried in the false bottom of the exploder, he will inspect the exploder, ensure that the spare keys are properly sealed in place, and give specific orders that the exploder is not to be removed from its container.

Immediately Before Firing

1508. The following will be the procedure before firing:

a. The officer in charge will satisfy himself that the sentries are on the look-out, that the area is clear and that all troops and spectators are outside the danger area or under the overhead cover provided.

b. He will then signal visually and by whistle that firing is about to begin.

c. On the acknowledgement of this signal by the sentries, he will give the signal to fire, (With electrical firing the exploder will not be attached until the signal is given).

After the Signal to Fire

1509. The following rules will be followed after the signal to fire:

a. No person will enter the danger area or move from the place of safety until the officer in charge gives the "All clear" signal.

b. When several charges are being detonated Simultaneously by means of detonating cord, or electrically, and when it is not possible to count each individual explosion, the officer in charge will allow the following times to elapse before he inspects the work:

If initiated by safety fuze—30 minutes
If initiated by electricity—10 minutes

Until he is satisfied that no misfire has occurred, he will not allow anybody to approach.

Misfires

1510. In the event of a misfire, the following precautions will be taken:

a. No one will normally be permitted to approach the charge until at least ten minutes have elapsed from the time of attempting to fire, if initiated electrically, or 30 minutes if initiated by safety fuze.

b. The misfire will then be dealt with by as few people as possible. The charge will not be removed or touched unless it is absolutely necessary to do so.

c. If accessible, a charge which has misfired should be rendered harmless by detonating a fresh charge close to it

d. The “danger area” will remain closed, and spectators, etc, under cover until the "All clear" is signaled on the completion of the removal or destruction of the misfire.

Class Instruction

1511. In the class, the following precautions will be taken:

a. During instruction, and at all times, all stores and exhibits will be treated as "LIVE', even when they are marked "INERT","IMITATION", "PRACTICE", "DUMMY", or "DRILL". All personnel must be made aware of this rule. The use of the terms "DUMMY" and “DRILL’’ in connection with training versions of mines and explosives has now been discontinued, but stores so marked may be encountered from time to time.

b. Training versions of mines and explosives [ie, those mentioned in subparagraph (a) above] will never be mixed with “LIVE” items.

c. A list of exhibits will be kept and checked before and after using. Every item will be accounted for before the class leaves.

d. All actions will be performed deliberately, and the reasons stated. Men learn more quickly by eye than by ear; good habits will, therefore, be inculcated from the beginning of training.

Battle Noise Simulation

1512. The safety precautions to be observed when explosives are used for battle noise simulation are set out in Infantry Training, Volume III, Pamphlet No. 31 (Code No. GSP-1203).

Table 32-Danger Areas for Typical Practices with High Explosive

Ser	Type of charge	Target	Size of charge	Danger area-radius	Remarks
(a)	(b)	(c)	(d)	(e)	(f)
1	Detonators, primers, detonating cord, in the open	-	-	20 yds	
2	Small practices charge	-	Up to 5 lb	(a) In the open-50 yds (b) Buried-100 yds	Applies only to small practice charges NOT fixed to any target
3	Cutting …	Trees	Any	300 yds	
4	Cutting …	Concrete pillars and beams	Any	500 yds	
5	Cutting …	Metal girders, rails, plate, etc	Any	1,000 yds	Fragments may fly up to 1,000 yds in all directions from quite small charge s. If it is possible to carry out the demolition in a covered pit, this radius may be reduced.
6	Cratering	Roads, runways, railways, etc	Up to 70 lb	300 yds	Includes cratering charges behind abutments, but NOT mined charges in contact with abutment

Ser	Type of charge	Target	Size of charge	Danger area-radius	Remarks
(a)	(b)	(c)	(d)	(e)	(f)
7	Cratering	Roads, runways, railways, etc.	Over 70 lb	500 yds	
8	Mined …	Piers, abutments, retaining walls	Any	500 yds	
9	Borehole …	Rock, brick, masonry	Any	500 yds	
10	Concussion …	Building of all types and permanent fortification	Any	1,000 yds but for Service personnel under supervision and wearing steel helmets this radius may be reduced to 500 yds	The blast effect of these types of charges is considerable. Against personnel in the open the danger from blast alone is negligible, but particular care must be taken in the selection of buildings as shelters. A defective structure may be wrecked by blast

Ser	Type of charge	Target	Size of charge	Danger area-radius	Remarks
(a)	(b)	(c)	(d)	(e)	(f)
11	Breaching, footing pressure	RC beams, slabs walls, obstacles, etc. Masonry obstacles and walls	Any	ditto	ditto
12	Bangalore torpedoes	Wire obstacles		a) At right angles to axis of torpedo-1,000 yds (b) In line along axis:- (i) Personnel standing- 200 yds (ii) Lying down-100 yds	

Ser	Type of charge	Target	Size of charge	Danger area-radius	Remarks
(a)	(b)	(c)	(d)	(e)	(f)
13	Shaped …	Concrete mild steel, armour plate	(a) CD No. 1 (Beehive $6\frac{3}{4}$lb)	300 yds	
			(b) CD No. 14 (Hayrick 11-lb	300 yds	
14	Under-water	a. Danger areas are the same as for similar types of charge fired on land. b. On training, charges should not be exploded until swimmers have left the water.			