

RESTRICTED

PART 4: SECTION 3

CHAPTER 2

WEAPON EFFECTIVENESS AND SELECTION

Introduction

1. To select the most suitable missile/fuse combination to attack a particular target, and to enable force requirements to be estimated, there must be a means of comparing the effects of weapons. Physical damage to a target can be assessed reasonably accurately, but the loss of usefulness caused by the damage is much more difficult to determine. The comparison of the effectiveness of different missiles is, therefore, usually made in terms of physical damage.

Weapon Effectiveness

2. Basically, the effectiveness of the missile depends on a number of physical attributes which are capable of causing destruction, namely:—

- (a) Blast.
- (b) Cratering.
- (c) Earth or underwater shock.
- (d) Fragmentation.
- (e) Fire.
- (f) Penetration.

3. These effects are found in most types of missiles and are largely functions of case strength and design, type of filling, charge/weight ratio, total weight of the missile, and type of fusing. Various combinations of these factors determine which effect will predominate.

4. The most convenient measure of effectiveness of a missile is the area over which a missile/fuse combination causes a specified degree of damage to a particular type of target. This is known as the Mean Area of Effectiveness (M.A.E.) and is defined as "the average area within which targets of a given type will be damaged to a specified or greater degree by unit weight of attack". The M.A.E. is generally expressed in acres per short ton (2,000 lbs.). Against a specific small individual target, such as a ship or

lock gates, it is usual to assess the number of hits necessary to achieve a desired result. For example, to sink a certain type of ship the assessment may be 15×25 A.P. rockets or 3 to 4 hits with 1,000-lb. M.C. bombs.

5. The degree of damage is defined by such categories as "killed or wounded" in the case of personnel, "destroyed or uninhabitable" in the case of dwellings, "percentage structural failure" in the case of commercial or industrial buildings, "scrapped or needing repair" in the case of machinery, and "sunk or seriously damaged" in the case of ships.

Missile Selection

6. On operations the best missile is not necessarily the one which can produce the required degree of damage with the lowest missile density on the target. Before finally selecting the missile or missiles for an attack on a particular target, certain interrelated operational factors have to be considered. The principal factors are:—

- (a) Availability of aircraft and recommended missiles.
- (b) Most effective load of the aircraft.
- (c) Method of attack, e.g. low, medium, high altitude.
- (d) Method of delivery, e.g. stick bombing, rocket salvo.
- (e) Accuracy of delivery to achieve the ultimate aim.
- (f) Direction of attack.

7. The weapon finally selected, after considering operational factors, will usually be the one that produces the greatest effectiveness per aircraft load against the particular components of a target, and so accomplishes the ultimate aim of the attack with the least overall effort.

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