

**GROUP OF GOVERNMENTAL EXPERTS OF
THE STATES PARTIES TO THE CONVENTION
ON PROHIBITIONS OR RESTRICTIONS ON
THE USE OF CERTAIN CONVENTIONAL
WEAPONS WHICH MAY BE DEEMED TO BE
EXCESSIVELY INJURIOUS OR TO
HAVE INDISCRIMINATE EFFECTS**

CCW/GGE/2007/WP.1/Add.1
3 May 2007

Original: ENGLISH

2007 Session

Geneva, 19-22 June 2007

Item 7 of the provisional agenda

Application and implementation

**of existing international humanitarian law
to specific munitions that may cause
explosive remnants of war, with particular focus
on cluster munitions, including the factors affecting
their reliability and their technical and
design characteristics, with a view to minimizing
the humanitarian impact of the use of these munitions**

**DRAFT
CCW PROTOCOL ON CLUSTER MUNITIONS**

Submitted by Germany

Addendum

**BENCHMARKS FOR ALTERNATIVE MUNITIONS
TO CLUSTER MUNITIONS
“SENSOR FUSED AREA MUNITIONS” (SEFAM)
ADDITIONAL EXPLANATORY INFORMATION
TO THE DRAFT CCW PROTOCOL ON CLUSTER MUNITIONS**

1. Germany is of the view that, in a mid-term perspective, cluster munitions should be replaced by alternative munitions that pose a significantly lower risk to the civilian population while meeting the necessary military requirements. On a national basis, Germany has already taken concrete steps in this direction, including the renunciation of cluster munitions of a dangerous dud rate above one percent.

2. Alternative munitions must fulfill the key provisions of the CCW Convention, i.e. to avoid indiscriminate and excessively injurious effects, while maintaining the balance between humanitarian goals and military requirements. “Alternative munitions” pursuant to Article 2 (paragraph 8), Article 4 (paragraph 3) and the Technical Annex of the draft CCW Protocol on Cluster Munitions have to meet the following main benchmarks:

I. Three Benchmarks for Alternative Munitions to avoid Indiscriminate Effects

(a) Reduced amount of explosive submunition

3. Recent conflicts have shown that the very high number of sub-munitions contained in the dispensers of cluster munitions caused significant hazards for the civilian population. In addition, sub-munitions had an unacceptably high rate of dangerous duds. Against this background, one benchmark for alternative munitions is the drastic reduction of the amount of explosive sub-munitions contained in each dispenser. It is obvious that, if the amount of explosive sub-munitions contained in one dispenser is reduced, for example from 1.000 to 10, the numerical basis for dangerous duds is minimized, thus significantly reducing the probability of the civilian population being affected.

(b) Accuracy

4. With regard to the protection of civilians, accuracy is an additional important tool. Therefore it is essential for a second benchmark to be that the sub-munitions of alternative munitions be effective only within a pre-defined target area. Any effect of sub-munitions outside the pre-defined target area must be excluded.

(c) Discriminating effect

5. In addition a third benchmark aims to ensure that sub-munitions of alternative munitions are technically capable of detecting a pre-defined target. This discriminating effect can be achieved through the use of radar-, infrared- and/or radiometric-sensors, which are integrated into the sub-munition. This benchmark works as follows: after deployment by a ground-based or airborne system, the dispenser releases the sub-munitions. At this moment the fuse of the sub-munition is armed and the detection sensors are activated. The detection phase ends when a defined height above ground level is reached. When the confidence level of the sensors is such that target detection is assured, the fuse of the sub-munition stays in the armed position. If, however, the confidence level of detection is not satisfactory, self-destruction will be activated at a given height, destroying the sub-munition. As a consequence there will be almost no attack, no dangerous dud on the ground and thus significantly less need for post conflict clearance operations.

II. Three Benchmarks for Alternative Munitions to avoid Excessively Injurious Effects

6. Benchmarks for alternative munitions to avoid excessively injurious effects cover sub-munitions with explosives [benchmarks (a) and (b)] and those which do not include explosives [benchmark (c)].

(a) Reliability

7. The first benchmark for the avoidance of excessively injurious effects by alternative munitions can be achieved through setting an adequate reliability factor. Reliable alternative

munitions means that their sub-munitions with explosives ensure a test based dangerous dud rate below one percent. This benchmark presupposes that requirements relating to reliability have to be included in the quality standards agreed with industry in the framework of the procurement process.

(b) Technical Safety Features

8. The second benchmark adds technical features such as self-destruction, self-deactivation and/or self-neutralization to the sub-munitions of the alternative munition. However, there is no guarantee that these technical features will effectively minimize the dud rate of sub-munitions; they can only serve as a supplementary safety feature. Their limited ability to increase safety has to be weighed against their considerably high cost.

(c) No explosives with the sub-munition

9. The third benchmark for the avoidance of excessively injurious effects is the use of sub-munitions that do not include explosives. One of these sub-munitions is called “Kinetic Energy Rods”. The dispenser contains metal rods, which engage military targets through kinetic energy. The advantage of this type of alternative munition is that, post impact, the rods are inert. Consequently, after the conflict, there is no hazard involving ERW for the civilian population and clearance operations are not needed.

III. Three Benchmarks for Alternative Munitions to maintain the Capability to engage Area Target Categories

10. Current types of Cluster Munitions are designed to engage three main different categories of targets: (i) the so-called point and single-target, (ii) small area targets, and (iii) large area targets. At present there is no cluster munitions model that is designed to engage all three target categories. Against this background it has to be assumed that this will also apply to alternative munitions. Alternative munitions will therefore have to exist in various types (models?) in order to be able to engage all three afore-mentioned target categories.

IV. Cumulative and optional Benchmarks

11. The political, humanitarian and military benchmarks for alternative munitions introduced in sections I., II. and III. are partly cumulative and partly optional, and can be summarized as follows:

(a) Four cumulative Benchmarks for Alternative Munitions

12. Alternative munitions have to meet all of the following four requirements:

- (i) Drastic reduction of the amount of sub-munitions with explosives;
- (ii) Enhanced reliability by minimizing the dangerous dud rate. The standard should limit the test based rate of dangerous duds to less than one per cent;

- (iii) Improved accuracy to limit the effects of the sub-munitions to the pre-defined target area only; and
- (iv) Maintaining the capability to engage the three categories of area targets.

(b) Three optional Benchmarks for Alternative Munitions

13. In addition to the cumulative benchmarks, alternative munitions should meet the following optional requirements:

- (i) Using sub-munitions without explosives in order to avoid duds.
- (ii) Ensuring a discriminating effect by having adequate target-detecting sensors integrated into the sub-munitions with explosives or
- (iii) Fitting an effective sensor to the dispenser of such alternative munitions, whose sub-munitions does not include explosives.

V. Definition on Alternative Munitions

14. On the basis of section IV, alternative munitions could be defined as follows: Alternative munitions means an air- or ground-launched dispenser that contains sub-munitions. Each alternative munition is designed to eject sub-munitions over a pre-defined area target. The dispenser:

- (i) which includes a sensor for accuracy, contains sub-munitions that are inert post impact, or
- (ii) contains less than ten sub-munitions with explosives, each of which includes multiple sensors with a capability to detect a target.

Alternative munitions could be described as “Sensor Fused Area Munitions” (SEFAM).

VI. Examples of present and future Alternative Munitions (SEFAM)

15. Four present and future examples of alternative munitions, which meet the aforementioned benchmarks, are introduced according to the category of area target each is designed for:

- (i) To engage point- and single targets. The 155 mm-artillery munition “DM 702” includes less than ten sub-munitions in its dispenser, which drastically reduces the numerical basis for duds. The sub-munitions have up to 10 explosives on board. Each sub-munition is equipped with a discriminating capability through three different sensors based on different target signatures: active radar, radiometric and infra-red. This alternative munition is available in stocks of Armed Forces.
- (ii) To engage small area targets. The “Sensor Fused Artillery-Munition (SMArt)” is similar to the afore-mentioned. Accuracy is ensured by a “Guided Missile Launch Rocket System”. This alternative munition could be available for Armed Forces in the coming years.

- (iii) To engage large area targets. The munition "Kinetic Energy Rods" contains sub-munitions without explosives, which excludes the basis for duds. Accuracy is ensured by a "Guided Missile Launch Rocket System". This alternative munition could be available for Armed Forces in the next decade.

 - (iv) To engage large area targets. The munition M26 "Kinetic Energy Rods" also contains sub-munitions without explosives. The munition is based on the MLRS Rocket M26. Major necessary modifications include replacing the payload with "Kinetic Energy Rods" and enhancing accuracy by adding a "Guided Missile Launch Rocket System". This alternative munition could be available for Armed Forces in the next decade.
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