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/VIII/WG.1/WP.1
23 July 2004

ENGLISH
Original: FRENCH

Eighth session
Geneva, 5-16 July 2004
Agenda item 7

Working Group on Explosive Remnants of War

Methodological approach to evaluation in the context of improvement of the design of certain specific types of munitions

Submitted by France

1. During the meeting of military experts held in March 2004, the Chairperson of the Group distributed a proposed matrix including various parameters to be taken into account in studying preventive measures which might be envisaged in order to improve the design of certain specific types of munitions with a view to reducing the humanitarian risk posed by such munitions when they become explosive remnants of war.

2. The French military experts wish to suggest a modification of this matrix based on a broadening of the criteria to be studied. Some clarifications will aid in understanding this initiative.

3. The “munitions” column is split into two in order to evaluate the quantity of munitions used in conflict and also to specify the model of munition, or more precisely the model of the detonator with which the munition is equipped, which the French experts consider should be the focus of attention. In more than 99 per cent of cases, malfunctioning of munitions is due to detonator failure. The quality of the fuses with which the munitions or submunitions are equipped should be given special attention from the viewpoints of design, manufacture, storage and use. Systematic provision of a security device to set off the charge would constitute a major asset in reducing unexploded remnants of war, as the function of this device would be to destroy the munition in the event of malfunctioning of the principal system.

GE.04-62527 (E) 130804 160804

4. The content of columns 3 and 4, which is the same as in the original matrix, is not expanded except to indicate certain important criteria of use in evaluating the humanitarian risk: the size of the munition, its ability to be neutralized simply, its anti-personnel "effectiveness" in the event of untimely operation, ease of locating it during the demining phase.

5. Column 5, on risk reduction capacity, is of fundamental importance. A simple reply is required (yes or no), depending on the technology and the date of the design.

6. If the reply is no, replacement of the priming system with a more up-to-date device should be envisaged. The reader should then refer to columns 21 and 22 (exchange of information [indication of the need of the country possessing a type of munition to obtain from a third party information whereby the operation of the munition could be improved] and assistance and cooperation [offer of or request for assistance in improving the operation of the munition in question]).

7. If the reply is yes, two types of measures may be envisaged:

(a) Future production (to supplement existing stockpiles) - columns 7 to 13; or

(b) Retrofit, i.e. reconstitution of existing stockpiles - columns 14 to 20.

8. For each of these measures, the same set of questions relate to:

(a) Review of the specification of the product (in terms of design? detectability?). In addition, prior to any decision on modification, a failure mode, effects and criticality analysis (FMECA), which does not exist for this product, must be carried out. This will involve, in terms of product specification, a study of the reliability and safety of the munition after the expected events and their causes have been listed and the likelihood of their occurrence defined;

(b) Review of the manufacture of the product. Prior to any decision to resume production, there will be a need:

- To conduct a study of the reliability and safety of the production process for the munition, which does not exist for this product. This study should be of the same type as that mentioned in relation to the specification of the product; and

- To reformulate the terms for monitoring the quality of production and the terms of acceptance for this product (stiffening the criteria for testing and/or acceptance), with the aim of improving its reliability in operation; and

(c) Estimates of the costs of the improvement actions which may be envisaged for the type of munition or detonator, either in the case of a resumption of manufacture (future production) or for all or part of the existing stockpile (retrofit).

9. Lastly, in terms of stockpile management (column 6), a number of questions must be asked:

(a) Is ageing regularly checked?

(b) Have certain batches undergone technical checks following operational faults?

(c) Have certain batches been banned from use because of reliability or safety problems?

(d) Might improvement of the stockpile management policy be sufficient to improve reliability in the field?

Methodological approach to evaluation in the context of improvement of the design of certain specific types of munitions

<table>
<tr><td>1</td><td colspan="3">Type</td><td rowspan="2">Munitions</td></tr>
<tr><td>2</td><td colspan="3">Quantity used in conflict</td></tr>
<tr><td>3</td><td colspan="4">Human risks</td></tr>
<tr><td>4</td><td colspan="4">Operational use</td></tr>
<tr><td>5</td><td colspan="4">Capability risks reduction</td></tr>
<tr><td>6</td><td colspan="3">Stocks management</td><td rowspan="20">Prevention capability</td></tr>
<tr><td>7</td><td>Reliability</td><td></td><td rowspan="8">Future productions</td></tr>
<tr><td>8</td><td>Detectability</td><td rowspan="2">Design</td></tr>
<tr><td>9</td><td>AMDEC product</td></tr>
<tr><td>10</td><td>AMDEC process</td><td rowspan="3">Production</td></tr>
<tr><td>11</td><td>Production quality assurance</td></tr>
<tr><td>12</td><td>Acceptance tests</td></tr>
<tr><td>13</td><td>Cost evaluation</td><td>Cost</td></tr>
<tr><td>14</td><td>Reliability</td><td rowspan="3">Design</td><td rowspan="7">Retrofit</td></tr>
<tr><td>15</td><td>Detectability</td></tr>
<tr><td>16</td><td>AMDEC product</td></tr>
<tr><td>17</td><td>AMDEC process</td><td rowspan="3">Production</td></tr>
<tr><td>18</td><td>Production quality assurance</td></tr>
<tr><td>19</td><td>Acceptance tests</td></tr>
<tr><td>20</td><td>Cost evaluation</td><td>Cost</td></tr>
<tr><td>21</td><td colspan="4">Information/exchange</td></tr>
<tr><td>22</td><td colspan="4">Assistance/cooperation</td></tr>
</table>

AMDEC - analyse de mode de défaillances et de la criticité =
FMECA - failure mode, effects and criticality analysis

How to fill in the matrix

Column 1	Specify the model of munition, or more precisely the model of the detonator with which the munition is equipped. Different munitions may be grouped together if they are equipped with the same detonator and stored in the same conditions, i.e. logistical packaging (wooden crate, for example).
Column 2	Evaluation of the quantity of munitions used in conflict - three levels of use proposed.
Column 3	Evaluation of the humanitarian risk posed by this type of munition. Criteria such as the size of the munition, its ability to be neutralized simply, its anti-personnel effectiveness in the event of untimely operation, and ease of locating it during the demining phase will be crucial in evaluating this risk in terms of five levels.
Column 4	Type of object targeted by this type of munition, AP, AV, area saturation or specific target.
Column 5	Reply yes or no depending on the technology and the age of the design. If the reply is no, replacement of the detonator on this munition with a more up-to-date device should be envisaged and the reader should refer to columns 21 and 22. If the reply is yes, please continue completing columns 6 to 22.
Column 6	Does this munition undergo regular ageing checks? Have certain batches undergone technical checks following operational faults, or been banned from use because of reliability or safety problems? Might improvement of the stockpile management policy for this munition be sufficient to improve operational reliability in the field?
Columns 7 to 13	For future production of this munition to supplement existing stockpiles, and to improve the reliability of the product with a view to reducing the unexploded remnants generated, is it necessary to:
Columns 7 to 9	Review the specification of the product?
Column 7	Review the design of the weapons system in which the cause of the malfunctioning has been clearly identified?
Column 8	Focus on the detectability of the munition by applying international colour coding?
Column 9	Before taking any decisions regarding modification, carry out a study of the reliability and safety of the specification of the munition by performing a failure mode, effects and criticality analysis (FMECA), which does not exist for this product?
Columns 10 to 12	Review the manufacture of the product?

Column 10	Before taking any decision regarding a resumption of production, carry out a study of the reliability and safety of the process of production of the munition by performing a failure mode, effects and criticality analysis (FMECA) on the production process, which does not exist for this product?
Column 11	Before taking any decision regarding a resumption of production, reformulate the terms for monitoring the quality of production for this product, with the aim of improving its reliability in operation?
Column 12	Before taking any decision regarding a resumption of production, reformulate the terms of acceptance for this product with the aim of improving its reliability in operation by stiffening the criteria for testing and/or acceptance?
Column 13	Estimate the costs of improvement measures which may be envisaged for this type of munition or detonator in the event of a resumption of production?
Columns 14 to 20	In the event that a retrofit of this munition may be envisaged for the reconstitution of existing stockpiles, and with the aim of improving the reliability of the product so as to reduce the unexploded remnants generated, is it necessary to:
Columns 14 to 16	Review the specification of the product?
Column 14	Review the design of the weapons system in which the cause of the malfunctioning has been clearly identified?
Column 15	Focus on the detectability of the munition by applying international colour coding?
Column 16	Before taking any decisions regarding modification, carry out a study of the reliability and safety of the specification of the munition by performing a failure mode, effects and criticality analysis (FMECA) on the specification, which does not exist for this product?
Columns 17 to 19	Review the manufacture of the product for the introduction of the retrofit?
Column 17	Before taking any decision regarding retrofit, carry out a study of the reliability and safety of the process of production of the munition by performing a failure mode, effects and criticality analysis on the production process (FMECA), which does not exist for this product?
Column 18	Before taking any decision regarding retrofit, reformulate the terms for monitoring the quality of production for this product with the aim of improving its reliability in operation?
Column 19	Before taking any decision regarding retrofit, reformulate the terms of acceptance for this product with the aim of improving its reliability in operation by stiffening the criteria for testing and/or acceptance?

Column 20	Estimate the costs of retrofit actions for the improvement of this type of munition or type of detonator for all or part of the existing stockpile. Compare this cost with the solution involving a resumption of production of new munitions which have been subjected to the measures identified in columns 7 to 13.
Column 21	Indication of the need of the country possessing this munition to obtain from a third party information whereby the operation of the munition could be improved.
Column 22	Offer of or request for assistance or cooperation in improving the operation of the munition described in the table.
