

Fifth Session

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Working Group on Explosive Remnants of War

### **Ensuring Munitions Reliability through Their Proper Handling**

#### **By the Russian Federation**

1. This document reflects the experience of the Russian Federation, as a leading country in the munitions field, in implementing technical annex No. 3, which deals with the handling of munitions throughout their life cycle.

2. The armed forces of the Russian Federation attach great importance to the proper handling of munitions at all stages of their life cycle in order to ensure their high reliability when they are used for their intended purpose. There are strict requirements concerning their:

- assembly;
- storage and maintenance;
- loading and unloading and transport;
- preparation for operational use.

3. Appropriate monitoring requirements have been established for each stage in the handling of munitions.

4. These requirements are considered in this document taking as an example 152-mm artillery ordnance, which is the largest ordnance used by the armed forces of the Russian Federation.
5. Munitions are manufactured in parts. They are assembled at specialized arsenals and bases, after which they are stored in specially equipped places. Munitions are stored in heated and unheated storage facilities, under sheds, in open storage areas or on vehicles.
6. All ground-level storage facilities, as well as sheds and open areas with munitions, are banked up in order to mitigate the consequences of an unauthorized explosion.
7. Munitions shall be arranged in such a way as to make it possible to monitor their condition.
8. The monitoring of the condition of munitions is an ongoing process.
9. The monitoring of the condition of munitions includes the following measures:
  - technical inspections;
  - laboratory testing of munitions and their component parts;
  - range testing;
  - monitoring of the proper performance of munitions during firing-range practice.
10. All batches of munitions stored in arsenals, bases and warehouses are subject to these types of monitoring.
11. One way of monitoring the condition of munitions is to conduct technical inspections.
12. Technical inspections of munitions and their components kept in storage facilities are conducted at least once every five years. Munitions stored in open areas and under sheds are inspected at least once every two years.

13. If, during a routine technical inspection, defects are found in munitions or their components, the technical inspections shall be conducted more frequently.
14. In a technical inspection, 2 per cent of each batch of munitions is taken. If defects are found during an inspection, the whole batch is inspected.
15. A decision on the continued storage and use of munitions is taken on the basis of the results of the technical inspections.
16. Laboratory testing of munitions and their components is carried out in order to:
  - determine the reliability of their performance;
  - study the degree and causes of changes in operational, physico-chemical, mechanical, electrical, random and other characteristics;
  - establish the safety of their continued storage and operational use.
17. In evaluating the condition of munitions, the following components of munitions are subject to laboratory tests:
  - fuses;
  - firing devices (blasting caps);
  - powder for propelling charges;
  - tracers (if any).
18. When necessary, explosives for ordnance may be subject to laboratory tests.
19. The first laboratory tests of all munitions components are conducted in the year in which their guaranteed shelf life expires.
20. Munitions returned to supply shall be subjected to laboratory tests upon expiry of their guaranteed shelf life and every five years thereafter.

21. If the results of laboratory testing are satisfactory, the next munitions tests are conducted five years thereafter.
22. The shelf life for components of 152-mm munitions kept in storage facilities is:
  - fuses: 35 years;
  - powder for propelling charges: 30 years;
  - blasting caps: 40 years.
23. The shelf life of ready (charged) artillery munitions is considered to be equal to the minimum shelf life of their components. Thus, the shelf life of fused munitions kept in storage facilities is 30 years.
24. Range testing of munitions is carried out in order to:
  - assess the reliability of their performance;
  - determine the stability of the operational characteristics of munitions and the ballistic characteristics of propelling charges;
  - study the reasons for unsatisfactory performance and emergencies that occurred during firing-range practice;
  - determine the impact of defects discovered during technical inspections and laboratory testing of munitions on their operational utility.
25. Monitoring of the performance of munitions in firing-range practice is carried out by troops. In order to determine the reasons for the unsatisfactory performance of munitions and emergencies during firing-range practice, special laboratory and range testing may be conducted when necessary.
26. In handling munitions, particular attention is given to loading and unloading operations.

27. Loading and unloading operations and the transport of munitions are carried out using special lifting devices and vehicles, and also non-standard equipment and devices that meet safety requirements and regulations.
28. Forks of loaders used in loading and unloading operations are chosen by their length and are attached in such a way as to exclude the possibility of a package containing munitions falling during transport and stacking. In order to prevent packages with munitions from falling, all loaders shall be equipped with clamps and pushers.
29. In handling of munitions, it is prohibited to tilt, drag, drop or throw packages containing munitions.
30. It is assumed that rounds and their components maintain their operational and performance characteristics and remain safe in the following situations:
  - after a single fall without packing from a height of no more than 1 m;
  - after a single fall in packing from a height of 1.5 m onto any surface (ground, concrete, rails, steel plate);
  - during and after the effect of short-term acceleration, for example, during air drops.
31. Munitions are fused for use for their intended purpose at stationary, mobile or temporary points.
32. The fusing of munitions consists of the screwing in and securing of the appropriate fuse in the fuse socket.
33. The fusing of 152-mm munitions directly in ordnance depots and at firing positions is prohibited.
34. Fuses unfit for operational use are exchanged as soon as they are found to be defective.
35. Munitions are fused in a fixed sequence involving the following basic operations:
  - preparation of artillery rounds;

- preparation of fuses;
- mounting of fuses;
- sealing of fuses and fused munitions;
- marking of fused munitions.

36. The fusing of munitions is one of the most demanding operations. Special technical training is therefore provided for supervisors, workers and maintenance staff in order to ensure the precision and safety of the fusing procedure.

37. In the fusing of munitions, the responsible personnel strictly meet the following requirements:

- they do not allow munitions to fall;
- they ensure that munitions are not exposed to mechanical shocks;
- they do not use instruments that are not intended for technical operations;
- fused munitions are immediately removed from the work area and placed in storage facilities.

38. In addition, efforts are made to ensure that work areas where munitions are assembled do not have protruding surfaces that come into contact with munitions and, in work with piezoelectric fuses, maintenance staff should not be dressed in clothing that conducts electricity easily in order to prevent the build-up of large charges of static electricity.

39. Munitions unfit for operational use and found to be unsafe are recycled or destroyed.

40. On the whole, the conduct of all measures to ensure the proper handling of munitions makes it possible to guarantee the high reliability of their use for their intended purpose and to minimize the risk of their becoming explosive remnants of war, which is confirmed in range testing, fire practice and operational use.