



Stockpile Security and Safety

1. General

Within mine action activities, stockpile destruction is as important as the other subjects, but its immediate risks are not as evident as for mine clearance.

Both safety and security are important issues during the whole stockpile destruction process, including:

- Storage
- Transportation and
- Handling

What means safety?

Safety means that hazardous effects of undesired events within the ammunition or explosives, including AP mines, affecting human beings and goods are avoided or at least minimized.

What means security?

Security means that ammunition and explosives, including AP mines, are protected against malevolent actions of any people, e. g. theft, robbery, sabotage.

Safety can be achieved by:

- Avoiding or minimizing the probability of an initial explosive or burning event
- Avoiding or minimizing the possibilities of transfer, expanding and increasing of the initial event to adjacent ammunition stocks
- Limiting the destructive effects of an explosion or a fire to an area as small as possible by measures such as adequate buildings and protective constructions.

The main destructive effects are:

- shock wave in the air,
- fragment throw,
- debris throw,
- hot gases,
- heat radiation,
- shock wave in the ground

- Limiting the number of people within the zones of high lethality and the duration of their presence within these zones

Security can be achieved by:

- Avoiding the access of unauthorized people to the stocks of ammunition and explosives
- Protection of the stocks against distant effects, e.g. by fire arms

This can be reached by:

- Surveillance
- Guarding
- Locking
- Constructive measures
- Secrecy
- Camouflage
- Convoying

2. Safety Measures

2.1. Condition of ammunition

The base for all subsequent safety measures is a good knowledge on the origin, the design, the age, the life history and the actual state of the APM (or other ammunitions).

An other important factor is the packing design and its actual state.

All explosives are more or less affected by the environmental influences during their lifetime. Generally, try to avoid or to minimize extent and duration or frequency of:

- High temperatures
- Temperature shocks
- Humidity
- Irradiation by sun or other sources
- Vibration and shocks

2.2. Storage buildings

Storage can be realized in above ground buildings, earth covered buildings (e.g. igloos), underground buildings (e.g. tunnels), portable containers, portable boxes or open.

Construction materials can be steel concrete, concrete, brick, metal, wood and combinations of these.

Open storage must be restricted to very short time periods.

Buildings should be:

- weather resistant and ventilated
 - fire resistant
 - bullet resistant
 - theft resistant
 - protected against lightning effects
- and have a thermal isolation.

Floors, and if possible also walls should be made of or be coated with non-sparkling material.

Adequate ventilation prevents excessive heating and humidity.

2.3. Fire prevention

In Annex E to IMAS 10.50 is contained a very complete list of fire prevention measures. The most important are:

- No smoking within 20 m of storage location
- Grass and undergrowth kept short around the magazine
- No flame or spark producing equipment within 20 m of storage location
- No flammable materials stored with ammunition and explosives
- No empty containers stored with ammunition and explosives
- Adequate fire fighting equipment shall be ready in a prominent position outside the storage location
- Articles not permitted into the magazine shall be listed at the entrance to the magazine
- Electrical installations adequately grounded
- Lightning protection
- Fire alarm triggering in place

2.4. Storage measures

Some important measures are:

- Avoiding the concentration of large amounts of ammunition and explosives in a small area, one single building, room or vehicle, limiting an eventual event
- Avoiding storage and transportation of small amounts of sensitive material, such as squibs and detonators together with larger amounts of relatively insensitive material of high explosive content (separation)
- Constructive measures, such as heavy concrete walls or earth mounds between storage buildings

3. Security Measures

In this field, national standards and regulations must be prepared and enforced by the national authorities responsible for AP mine destruction. They must cover the whole destruction process from planning and stockpile evaluation until the destruction of the last mine. Accounting and reporting should be supervised by an authority independent from staff directly involved in the destruction process.

Often, a certain measure is useful to improve both safety and security, e.g. protective earth mounds or separation of large amounts of explosives, but sometimes a measure is contradictory and must be analyzed carefully and often be combined with other measures to meet both safety and security requirements.

4. Conclusion

Safety and security measures represent an important part of AP mine destruction programmes.

All people in direct contact with the mines must be aware of the importance of safety and security and have the necessary knowledge in these subjects. On the other hand, safety and security experts should supervise the compliance of the different steps of the destruction process with the necessary safety and security requirements.