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MINES IN USE IN MULTINATIONAL OPERATIONS

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Abstract:

Members of the Ministry of Defence (MoD) and the Serbian Armed Forces (SAF) have been engaged in multinational operations (MnOPs) from 26 June 2002. During the engagement in UN MnOPs, one of the key problems is the procedures when encountering some kind of ordnance. During the preparation of MoD and SAF members for joining UN MNOPs, one of the main problems is a small number of qualified and trained instructors as well as the lack of necessary literature. The paper presents a summary review of one ordnance type - mines, i.e. a review of the most typical representatives of mine types that can be found in some of the territories where MnOPs are conducted. In order to prevent mine accidents, particular attention must be paid to the training i.e. preparation of MoD and SAF members for their participation in MnOPs. The work is primarily based on the currently available literature as well as on the experiences of MoD and SAF members who were engaged in UN MnOPs.

Key words: *mines, use, training, multinational operations.*

Introduction

Ordnance includes the entire military equipment containing explosives, nuclear fusion and fission materials, as well as biological and chemical agents. The concept of ordnance includes the following resources:

– Bombs and warheads,
– Guided and ballistic missiles,

– Artillery and mortar shells,
– Rockets and small arms,
– All types of mines,
– Torpedoes and underwater missiles,
– Pyrotechnics,
– Cluster bombs,
– Launching mechanisms,
– Charges and rocket propellant igniter charges,
– Electric detonators, and
– Illegal and improvised explosive devices (Radić, 2001).

In order to raise awareness of the dangers of ordnance in the world, international organizations for the implementation and monitoring of demining in the world have produced a report on demining (Landmine monitor, 2010). The report gives indicators of dangers of ordnance and what is undertaken regarding demining worldwide. Here are some facts concerning ordnance removal hazards:

– In 2009, there were 3,956 victims of mine accidents, which is 28% percent less than in 2008, and the least since 1999 or since the start of monitoring (due to incomplete data, it is assumed that the number of victims exceeds all the mentioned above).
– It is confirmed and/or suspected that 66 states and 7 regions in the world have a problem with dangerous territories, which is three countries fewer since 2011.
– In 2009, 198 km² of dangerous territories were demined, which is by far the biggest cleared area on an annual basis, when a total of 255,000 anti-personnel mines and 37,000 anti-tank mines were removed.
– At least 359 km² of areas having witnessed armed conflicts were cleared and about 2.2 million ordnance types removed.
– The biggest number of demining projects was in Afghanistan, Cambodia, Iraq, Croatia and Sri Lanka, which is more than 80 % of demining projects.
– Mine Risk Education is continued to be implemented in many countries and areas that have problems with mine risks.
– In 2009, about 449 million US dollars were donated for mine clearance, out of which Germany donated about 61%.
– Only one country in the world laid antipersonnel mines (Myanmar).
– 12 manufacturers of anti-personnel mines were identified, most notable ones being from India, Myanmar and Pakistan.

– Antipersonnel mines were used by non-state armed groups in six countries - Afghanistan, Colombia, India, Myanmar, Pakistan and Yemen. This is so far the smallest number of armed forces or armed groups that used antipersonnel mines.

Also, the statistics indicates the following:

– From 3 to 30 US dollars takes to lay a mine, while the cost of its clearance is from 300 to 1000 US dollars.
– In the world, there is a mine accident every 50 min.
– Every month, about 800 people get killed, 1,200 people get injured and until today 500 thousand people are disabled due to mine accidents. (Kovačević, Popović, 2016, p.389)
– The overview of countries having problems with mines and cluster munitions is shown in Figures 1 and 2.

Figure 1 – World countries with mine risks (marked in red)
Рис. 1 – Страны, в которых существует минная опасность (обозначены красным цветом)
Слика 1 – Земље света у којима постоји опасност од мина (означене су црвеном бојом)

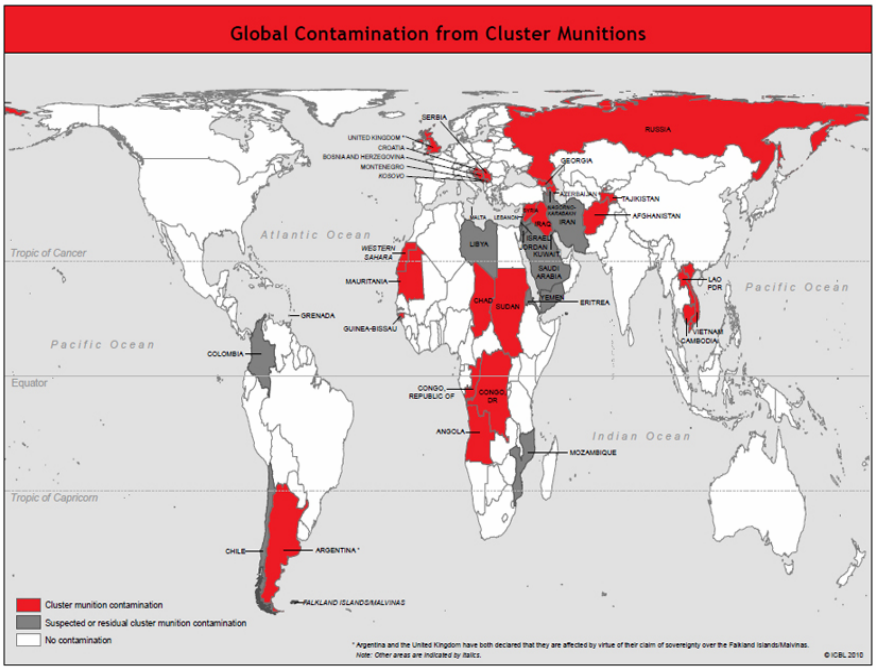

Figure 2 – Countries in which there is danger of cluster munitions
Рис. 2 – Страны, в которых существует опасность от кассетных боеприпасов
Слика 2 – Земље у којима постоји опасност од касетне муниције

In order to take measures to reduce the threat of explosives, an international demining organization in the world, made agreements obliging signatories to the agreement (the state) to adhere to the signed agreement concerning the use, production, storage and transportation of a part of explosives. Of the agreements reached as the most important ones are as follows:

– Mine Ban Treaty or Ottawa Treaty - regulates a total ban on the use, stockpiling, production and transport of anti-personnel mines and their destruction.
– 2008, UN GA Resolution 63/42 - application of the Convention on the Prohibition of the Use, Stockpiling, Production and Transport of Anti-personnel Mines and on their Destruction.
– Convention on Conventional Weapons - Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons which may be considered inhumane.
  • Protocol 2 - the prohibition or restriction of the use of mines, booby traps and other explosive devices.

• Protocol 5 - removal of residual and unexploded ordnance.

– Convention on Cluster Munitions - the prohibition of the use, stockpiling, production and transport of cluster munitions. Specific articles in the Convention relate to assistance to victims, clearance of contaminated areas and destruction of stocks. The Convention was adopted in Dublin on 30.05.2008 by 107 countries and signed on 03.08. of the same year. The Convention entered into force on 01.08.2010 and became legally binding for States Parties. The first meeting of States Parties was held in Laos from 9 to 12.11.2010.
– UN Convention on the Rights of Persons with Disabilities - The Protocol was adopted at the UN headquarters in New York on 13.12.2006. Until 30.03.2007, 82 countries signed the Convention, 44 countries signed the Protocol, and one country ratified the Convention. The Convention entered into force on 03.05.2008.

Mine - basic theoretical provisions

Mines are a type of ordnance placed on or in the ground or on any other surface that could be activated by the presence or contact of a person or a vehicle. Based on their characteristics, it is said that: ,,A mine is a perfect soldier. It never sleeps, never asks for payment or food, never misses the target nor asks about tasks or cares about victims. It is operational for more than fifty years. It is very difficult to find and inexpensive to purchase.“ (NATO, 2010)

In principle, each mine consists of a mine body (casing), explosive charge (in further text EC), an igniter, a cap and a booster. The mine main components are given in Figure 3. (Kovačević, 2015, p.197)

Mines are considered to be the most dangerous type of ordnance due to the following characteristics:

– the possibility of different ways of activation,
– durability and reliability,
– high sensitivity,
– severe destructive and wounding effect,
– ease of installation, and
– a good possibility of masking. (Uprava inžinjerije, 1970)

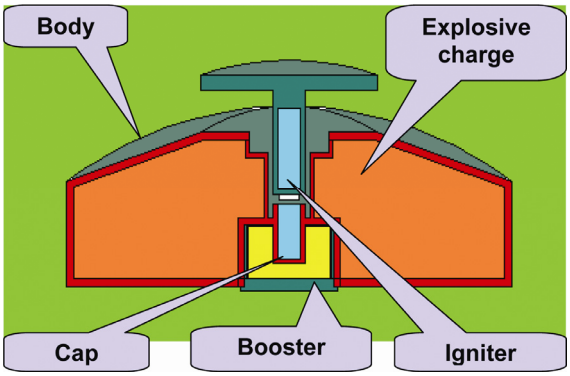

Figure 3 – Mine with the essential components
Рис. 3 – Мина с основными частями
Слика 3 – Мина са основим деловима

Mines can be activated in the following ways:
– contact (by pressure, movement, release, etc.),
– orchestrated (controlled),
– presence (without physical contact), and
– self-destruction.

Currently in the world there are over 600 types of mines classified according to various criteria. However, the most common is the division according to purpose (division used in MnOps):
– Anti-personnel mines,
– Anti-vehicle mines or Anti tank mines. (http://www.mineaction.org)

Anti-personnel mines are designed to kill or cause casualties to enemy personnel. They are generally small in size, of different shapes and can be made of different materials (wood, plastic or metal).They are most commonly triggered by physical contact and by tripwires, but can also be orchestrated or triggered by a time fuze. They are mainly buried in the ground, but can be set on the ground or other surface. They are almost always designed to be hidden and disguised. This type of mines is classified according to the mode of action:
– Blast mines (with a blast effect when a person steps on them) and
– Fragmentation mines (they have a blast effect and project fragments across a wide area). (http://www.mineaction.org)

Blast mines have a blast shock wave effect due to small amounts of explosives (about 0.1 kg) not designed to kill but to inflict injuries, usually to lower extremities, which due to their seriousness, often lead to amputation and, consequently, have a major psychological impact on people. Landmines are usually cylindrical in shape with a diameter of 70 to

160 mm and a height of 50 to 100 mm. However, a number of landmines are rectangular with the dimensions of 100x180 mm up to 150x300 mm. Landmines can be of various colors but the most common ones are olive, green, black, brown or gray. The most serious injuries are inflicted by landmines with shaped charge. (http://www.defence.gov.au/uxo/index.asp)

Fragmentation mines (blast shock effect and fragments) have higher amounts of explosives (from 0.3 to 0.5 kg) and are intended to inflict injuries to more people simultaneously. Most of these mines have metal casings or contain ball bearings or metal fragments which contribute to severe lethal effect to the target. Fragmentation mines operate within a radius of 360º and generally cause casualties within a radius of 10 to 50 m. Fragmentation mines the fragments of which are unequal in size can achieve a lethal effect at a distance of 100 m. Fatal injuries are not uncommon. There are three basic types of fragmentation mines:

- Stake Anti-Personnel Mines,
- Directional Fragmentation Anti-Personnel Mines,
- Bounding Fragmentation Anti-Personnel Mines.
  (http://www.defence.gov.au/uxo/index.asp)

Stake Anti-Personnel Mines, mostly activated by pulling tripwires, are designed to cause casualties to a number of people simultaneously. They are placed on wooden or metal stakes at about 200 mm above the ground, and can be fixed on trees and buildings. They are usually painted green, or they may be unpainted wood or metal. Two or more tripwires can be strung from a mine to another object (usually another stake or a tree). It is not rare that several landmines are buried along the direction of tripwires. (http://www.mineaction.org)

Directional Fragmentation Anti-Personnel Mines are intended to cause injuries to a larger number of people in a specified direction. Most of the mines of this kind look like a curved rectangular box with legs and are mostly olive, black, brown and green. Mines are usually command detonated from distance or initiated by tripwire. Material fragments (mainly mine casing and ball bearings) are projected within an angle of 60º horizontally and 3º vertically. Generally, ball bearings have an effective range of 50 m from the explosion site. (http://www.defence.gov.au/-uxo/index.asp)

Bounding Fragmentation Anti-Personnel Mines are designed to cause casualties to a large number of people. They are usually buried so that only the fuze is above the surface, and are activated by pressure or by triggering tripwires. They are commonly up to 150 mm in diameter and up to 300 mm in height. Once triggered, bounding fragmentation antipersonnel mines “jump” out of the ground to a height of 1 m and

operate in a 360º radius.Their effective range is from 10 to 50 m and they are most likely to be lethal within 25 m and capable of inflicting serious injury at ranges up to 100 m. (http://www.defence.gov.au/uxo/index)

Anti-vehicle mines or anti tank mines are designed for disabling and destroying vehicles. Like anti-personnel mines, they are mostly detonated by pressure (requiring a greater force of pressure), but may be triggered by other ways, especially when equipped with special fuzes. They are placed mainly on roads for motor vehicles. It is not rare that anti-tank mines are buried together with anti-personnel mines. Anti-tank mines are usually round and square in shape, 230 mm in diameter and 100 mm in height to 400 mm in diameter and 160 mm in height. The casing can be made of wood, plastic or metal and in various colors. Anti-tank mines are generally triggered by a pressure of 120 kg to 150 kg. Given that one of the purposes of anti-tank mines is disabling and destroying tanks, they contain greater amounts of explosives and, in case they are activated by civilian vehicles, the consequences for the people in them are catastrophic. (Department of Defence, Australia, 2003)

Information on the use of landmines in MnOps

The rest of this paper provides an overview of the types of mines and their representatives most often found in territories where MnOps are deployed, primarily based on the experience of MnOps participants. Anti-personnel mines, especially fragmentation ones, and anti-tank mines are presented. Each mine type representative is described in terms of the country of manufacture, the countries where they are used and the basic tactical and technical specifications. The overview is also based on official reports of various agencies and non-governmental organizations from many countries, who are fighting for a ban on the production and the use of mines.

The VS-50 anti-personnel mine (Figure 4), produced in Italy, was used in Afghanistan, Angola, Ecuador, Iraq, Kuwait, Lebanon, Mozambique, Peru, Rwanda, Sri Lanka, Western Sahara and Zimbabwe (Radić, 2001). Some variants of this mine include metal plates, and can easily be found with metal detectors, but in other variants metal plates were replaced with plastic thus making them difficult to detect. The mine casing is usually green or sand colored. The tactical and technical data:

- height: 45 mm,
- diameter: 90 mm,
- EC weight: 0.045 kg,
- type of explosive: cyclotrimethylenetrinitramine (RDX).

Figure 4 – VS-50 mine
Рис. 4 – Мина VS-50
Слика 4 – Мина VS-50

The YM-1 anti-personnel mine (Figure 5), produced in Iran, is a newer design of the VS-50 mine. This type of mine was used in Afghanistan and Iran (Radić, 2001). The mine casing is made of plastic and is usually black, green or sand coloured. The tactical and technical data:

– height: 45 mm,
– diameter: 90 mm,
– EC weight: 0.05 kg,
– type of explosive: RDX.

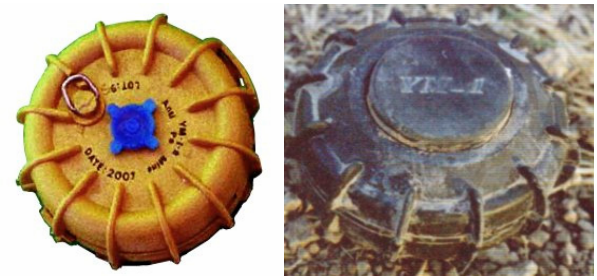

Figure 5 – YM-1 mine
Рис. 5 – Мина YM-1
Слика 5 – Мина YM-1

The PPM-2 antipersonnel mine (its external and internal appearance is shown in Figure 6) was produced in the former German Democratic Republic. This type of mine was used in Angola, Cambodia, Chad, Eritrea, Ethiopia, Lebanon, Mozambique, Namibia and Somalia. The plastic mine casing is usually black. The tactical and technical data:

– height: 60 mm,
– diameter: 134 mm,
– EC weight: 0.11 kg,
– type of explosive: trinitrotoluol (TNT) (Radić, 2001)

Figure 6 – PPM-2 mine
Рис. 6 – Мина PPM-2
Слика 6 – Мина PPM-2

The anti-personnel mine No. 4 (Figure 7), produced in Israel, was used in Afghanistan, Israel, Iraq, the Falklands, Lebanon and Sudan. Due to its design and quality materials, this mine is very sensitive to pressure and stable in the ground, which has resulted in a large number of accidents during its clearance. The tactical and technical data:

– height: 50 mm,
– diameter: 135 mm,
– width: 65 mm,
– EC weight: 0.188 kg,
– type of explosive: TNT(http://www.mineaction.org).

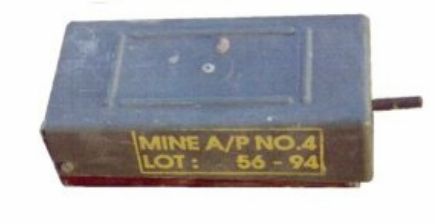

Figure 7 – No.4 mine
Рис. 7 – Мина №4
Слика 7 – Мина No.4

The Type 72 anti-personnel mine (its external and internal appearance is shown in Figure 8), produced in the People's Republic of China, was used in Afghanistan, Angola, Cambodia, China, Eritrea, Iraq, Kurdistan, Kuwait, Lebanon, Mozambique, Namibia, Peru, Somalia, Sri Lanka, Sudan and Thailand. The plastic casing is usually green with a green ring on the top (Radić, 2001). Since it has a very low metal content, it is very difficult to detect with a metal detector. Modern versions of this type of mines are Type 72a and Type 72b, which are equipped with electronic devices, which further increases the sensitivity of the mine. The tactical and technical data:

– height: 38 mm,

– diameter: 78 mm,
– EC weight: 0.051 kg,
– type of explosive: TNT.

Figure 8 – Type 72 mine
Рис. 8 – Мина Тип 72
Слика 8 – Мина Tip 72

The M969 anti-personnel mine (Figure 9), produced in Portugal, is a modern version of the Belgian NR 409 mine. This type of mine was used in: Angola, Mozambique, Namibia and Zimbabwe. The plastic casing is usually dark green or brown, with a large black plastic lid. It is characteristic that it has a very low metal content so that it is very difficult to detect with a metal detector. The tactical and technical data:

– height: 28 mm,
– diameter: 82 mm,
– EC weight: 0.08 kg,
– type of explosive: TNT-Composition B. (http://www.mineaction.org)

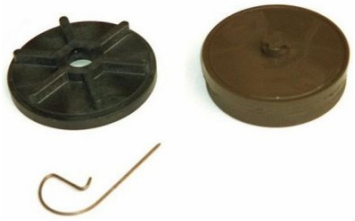

Figure 9 – M969 mine
Рис. 9 – Мина M969
Слика 9 – Мина M969

The P4 Mk1 and Mk2 anti-personnel mines (Figure 10), produced in Pakistan, were used in: Afghanistan, Angola, Eritrea, Ethiopia, Pakistan, Somalia, India and Sri Lanka. In countries where these mines were used, they were branded as P4Mk1 and P4Mk2. They, characteristically, have a very low metal content so that it is very difficult to detect them with a metal

detector. The casing is usually brown or green, with a yellow ring between the upper and lower halves. The tactical and technical data:

– height: 40 mm,
– diameter: 70 mm,
– EC weight: 0.03 kg,
– type of explosive: tetryl. (http://www.mineaction.org)

Figure 10 – P4 Mk1 mine
Рис. 10 – Мина P4 Mk1
Слика 10 – Мина P4 Mk1

The PMN antipersonnel mine (Figure 11), known as the Black Widow, was produced in the former Soviet Union. This type of mine was used in: Afghanistan, Angola, Azerbaijan, Cambodia, Chechnya, Egypt, Eritrea, Ethiopia, Georgia, Honduras, Iraq, Laos, Lebanon, Libya, Mozambique, Namibia, Nicaragua, Rwanda, Somalia, Sudan, Tajikistan, Vietnam and Yemen. The Bakelite casing is reddish-brown, with black rubber on the top.The tactical and technical data:

– height: 56 mm,
– diameter: 112 mm,
– EC weight: 0.24 kg,
– type of explosive: TNT. (http://www.mineaction.org)

Figure 11 – PMN mine
Рис. 11 – Мина PMN
Слика 11 – Мина PMN

The PRB-M35 anti-personnel mine (Figure 12), produced in Belgium, was used in: Jordan, Angola, Chad, Ecuador, Eritrea, Lebanon, Peru,

Somalia, Sudan, Uganda and Western Sahara. Since it has a very low metal content, it is very difficult to detect with a metal detector. The casing is usually olive green. The tactical and technical data:

– height: 56 mm,
– diameter: 112 mm,
– EC weight: 0.24 kg,
– type of explosive: TNT. (Radić, 2001)

Figure 12 – PRB-M35 mine
Рис. 12 - Мина PRB-M35
Слика 12 – Мина PRB-M35

The M14 anti-personnel mine (Figure 13), produced in the USA, was used in: Angola, Cambodia, Chad, Chile, El Salvador, Eritrea, Ethiopia, Iran, Iraq, Jordan, Laos, Lebanon, Malawi, Mozambique, Somalia, Vietnam and Zambia. The casing is usually olive green, but can be found in black or green. It contains a small amount of metal so it is very difficult to detect with a metal detector. Various copies and variants of this type of mines are made for the needs of the armed forces of Vietnam, Turkey and India. The tactical and technical data:

– height: 40 mm,
– diameter: 56 mm,
– EC weight: 0.029 kg,
– type of explosive: tetryl. (Radić, 2001)

Figure 13 – M14 mine
Рис. 13 – Мина M14
Слика 13 – Мина M14

The VALMARA 69-V69 antipersonnel fragmentation mine (Figure 14), made in Italy, has also its copy produced in South Africa. It was used in:

Angola, Egypt, Iraq, Kurdistan, Kuwait, Mozambique, Sudan and Western Sahara. The casing is usually green or sand colored. It can be armed with fuses which react to movement and pressure (by stepping on it). The tactical and technical data:

- height: 205 mm,
- diameter: 130 mm,
- EC weight: 0.42 kg,
- type of explosive: TNT or RDX (Composition B). (Radić, 2001)

Figure 14 –VALMARA 69-V69 mine
Рис. 14 – Мина VALMARA 69-V69
Слика 14 – Мина VALMARA 69-V69

The OZM-4 antipersonnel fragmentation mine (Figure 15) was produced in the former Soviet Union. This type of mine was used in: Afghanistan, Angola, Cambodia, Cuba, Eritrea, Ethiopia, Mozambique, Namibia, Nicaragua, Sudan, Vietnam, Yemen and Zambia. The mine casing is usually olive green. It can be armed with fuzes which react to movement, pressure (stepping on it), or distance activation. The tactical and technical data:

- height: 140 mm,
- diameter: 91 mm,
- EC weight: 0.17 kg,
- type of explosive: TNT. (Radić, 2001)

Figure 15 – OZM-4 mine
Рис. 15 – Мина OZM-4
Слика 15 – Мина OZM-4

The OZM-72 antipersonnel fragmentation mine (Figure 16) is a variant of the OZM-4 mine design. The OZM-72 mine was also designed and manufactured in the former Soviet Union. This type of mine was used in: Afghanistan, Angola, Cambodia, Cuba, Eritrea, Ethiopia, Mozambique, Namibia, Nicaragua, Sudan, Vietnam, Yemen and Zambia. The mine casing is usually olive green. It is characterized by a large amount of explosive and high destructive power. The mine can be also armed with fuzes which react to movement, pressure (stepping on it), or they can be activated from distance. The tactical and technical data:

– height: 172 mm,
– diameter: 106 mm,
– EC weight: 0.5 kg,
– type of explosive: TNT. (http://defence.gov.au/uxo/index.asp)

Figure 16 – OZM-72 mine
Рис. 16 – Мина OZM-72
Слика 16 – Мина OZM-72

The POMZ-2 antipersonnel fragmentation mine (Figure 17) was produced in the former Soviet Union. Since it is very simple to manufacture, this type of mine, or its copy, was used in many countries of the world, mostly in Asia. The mine casing is usually olive green and a wooden stake can be green or brown. It is triggered by tripwire. The tactical and technical data:

– height: 130 mm,
– diameter: 60 mm,
– EC weight: 0.075 kg,
– type of explosive: TNT. (Radić, 2001)

Figure 17 – Mine POZM-2
Рис. 17 – Мина POZM-2
Слика 17 – Мина POZM-2

The PROM-1 anti-personnel fragmentation mine (Figure 18) was produced in the former SFR of Yugoslavia. This type of mine was used in: Bosnia and Herzegovina, Croatia, Iraq, Namibia and Angola. The mine casing is usually olive green. The mine can be activated by pressure or tripwire. The tactical and technical data:

– height: 260 mm,
– diameter: 75 mm,
– EC weight: 0.425 kg,
– type of explosive: TNT. (Radić, 2001)

Figure 18 – PROM-1 mine
Рис. 18 – Мина PROM-1
Слика 18 – Мина PROM-1

The M16A1 anti-personnel fragmentation mine (Figure 19), produced in the USA, was used in: Angola, Cambodia, Chile, Cuba, Cyprus, Eritrea, Ethiopia, Iran, Iraq, Korea, Mozambique, Thailand, Western Sahara, and Zambia. It is one of the most common mines in the world. The mine casing is usually olive green, with the mine name written in yellow on it. It can be activated by pressure or by tripwire. The tactical and technical data:

– height: 203 mm,
– diameter: 103 mm,
– EC weight: 0.575 kg,
– type of explosive: TNT. (http://mineaction.org)

Figure 19 – M16A1 mine
Рис. 19 – Мина M16A1
Слика 19 – Мина M16A1

The PP Mi-Sr II antipersonnel fragmentation mine (Figure 20) was produced in Czechoslovakia. This type of mine was used in: Afghanistan, Angola, Cambodia, Costa Rica, Djibouti, Egypt, Eritrea, Ethiopia, Honduras, Lebanon, Mozambique, Namibia, Nicaragua, Somalia, Yemen and Zambia. The mine casing is olive green or yellow. The tactical and technical data:

– height: 152 mm,
– diameter: 102 mm,
– EC weight: 0.36 kg,
– type of explosive: TNT. (Radić, 2001)

Figure 20 –PP Mi-Sr II mine
Рис. 20 – Мина PP Mi-Sr II
Слика 20 – Мина PP Mi-Sr II

The M421 antipersonnel fragmentation mine (Figure 21), produced in Portugal, was used in: Chad, Lebanon, Rwanda, Somalia, Uganda and Western Sahara. The mine casing is usually dark green or sand colored with yellow lettering. It is activated by tripwire. The tactical and technical data:

– height: 114 mm,
– diameter: 46 mm,
– EC weight: 0.1 kg,
– type of explosive: TNT Composition B. (http://www.defence.gov.au/uxo/index.asp)

Figure 21 – M421 mine
Рис. 21 – Мина M421
Слика 21 – Мина M421

The TM57 anti-tank mine (Figure 22) was produced in the former Soviet Union. This type of mine was used in: Afghanistan, Angola, Azerbaijan, Cambodia, Chad, Chechnya, Djibouti, Eritrea, Ethiopia, Iraq, Korea, Kuwait, Lebanon, Mozambique, Namibia, Nicaragua, Rwanda, Somalia, Sudan, Vietnam, Western Sahara, Zimbabwe, and Zambia. The mine casing is usually olive green with the mine name in black. It has an additional well designed for a secondary fuze. The tactical and technical data:

– height: 102 mm,
– diameter: 316 mm,
– EC weight: 6.34 kg,
– type of explosive: TNT or TGA or MS. (Radić, 2001)

Figure 22 – TM57 mine
Рис. 22 – Мина TM57
Слика 22 – Мина TM57

The TM46 anti-tank mine (Figure 23) was produced in the USSR. A version of this mine, called No 6, is produced and is in operational use by the armed forces of Israel. This type of mine was used in: Afghanistan, Angola, Azerbaijan, Cambodia, Chad, Chechnya, Djibouti, Egypt, Eritrea, Ethiopia, Iraq, Kuwait, Lebanon, Mozambique, Namibia, Rwanda, Somalia, Sudan, Thailand, Western Sahara, Yemen, Zimbabwe and Zambia. The mine casing is usually olive green. It has an additional well designed for a secondary fuze. The tactical and technical data:

– height: 108 mm,

– diameter: 305 mm,
– EC weight: 5.7 kg,
– type of explosive: TNT. (http://www.mineaction.org)

Figure 23 – TM46 mine
Рис. 23 – Мина TM46
Слика 23 – Мина TM46

The TMK-2 anti-tank mine (Figure 24) was produced in the USSR. This type of mine was used in: Afghanistan, Angola, Azerbaijan, Eritrea, Ethiopia, Iraq, Mozambique and Namibia. The tactical and technical data:

– height: 265 mm,
– diameter: 307 mm,
– EC weight: 6.5 kg,
– type of explosive: TNT or TG-50. (Radić, 2001)

Figure 24 – TMK-2 mine
Рис. 24 – Мина TMK-2
Слика 24 – Мина TMK-2

The VS-2.2 anti-tank mine (Figure 25), manufactured in Italy, belongs to the family of the VS type. This type of mine was used in Iraq and Kuwait. The casing is usually brown or green (Radić, 2001). Based on this mine, very similar mine types (VS 3.6 and SH-55) were designed; their tactical and technical characteristics are given in Table 1 (Uprava inžinjerije, 1999).

Table 1 – Tactical - technical characteristics of the VS-2.2, 3.6 and SH-55 type mines
Таблица 1 – Тактико-технические характеристики мин типа VS-2.2, VS-3.6 i SH-55
Табела 1 – Тактичко-техничке карактеристике мина типа VS-2.2, VS-3.6 и SH-55

Characteristic	Type of mine		
	VS-2.2	VS-3.6	SH-55
height - mm	115	115	122
diameter - mm	230	248	280
EC weight - kg	2.2	4	5.5
type of explosive	Composition B		

Figure 25 – VS-2.2 mine
Рис. 25 – Мина VS-2.2
Слика 25 – Мина VS-2.2

The MK5NS anti-tank mine (Figure 26), produced in the UK, was used in: Angola, Egypt, Jordan, Mozambique and Zimbabwe. The casing is usually olive green. The tactical and technical data:

– height: 127 mm,
– diameter: 203 mm,
– EC weight: 2.05 kg,
– Type of explosive: TNT. (Radić, 2001)

Figure 26 – MK5NS mine
Рис. 26 – Мина PRB MK5NS
Слика 26 – Мина MK5NS

The PRB M3 and PRB M3A1 anti-tank mines (Figure 27), produced in Belgium, were used in: Angola, Chad, Chechnya, Eritrea, Ethiopia, Iraq, Lebanon, Rwanda, Somalia, Western Sahara and Zambia. The casing is usually olive green with the name in yellow on it.The tactical and technical data:

– height: 130 mm,
– diameter: 230x230 mm,
– EC weight: 6.00 kg,
– type of explosive: TNT. (Radić, 2001)

Figure 27 – PRB M3 mine
Рис. 27 – Мина PRB M3
Слика 27 – Мина PRB M3

The YM-III anti-tank mine (Figure 28), produced in Iran, was used in: Afghanistan, Angola, Cambodia, Iraq, Kuwait, Mozambique, Peru, Somalia, Taiwan and Thailand. The casing is usually olive green or sand colored, with the name written in black letters. The tactical and technical data:

– height: 110 mm,
– diameter: 270 mm,
– EC weight: 5.7 kg,
– type of explosive: RDX or TNT. (Radić, 2001)

Figure 28 – YM-III mine
Рис. 28 – Мина YM-III
Слика 28 – Мина YM-III

The M19 anti-tank mine (Figure 29), produced in the USA, was used in: Afghanistan, Angola, Azerbaijan, Chad, Chile, Cyprus, Iran, Iraq, Jordan, Korea, Lebanon, Western Sahara and Zambia. The casing is generally olive green, with the mine name in yellow on it. The tactical and technical data:

– height: 94 mm,
– diameter: 332x332 mm,
– EC weight: 9.53 kg,
– type of explosive: Composition B. (http://www.mineaction.org)

Figure 29 – M19 mine
Рис. 29 – Мина M19
Слика 29 – Мина M19

The M6 anti-tank mine (Figure 30), produced in the USA, exists in several versions: M6A1, M6A2 and M15. This type of mine was used in: Angola, Korea, Cyprus, Lebanon, Rwanda, Thailand and the Western Sahara. The mine casing is usually dark olive green with the mine name in yellow. The tactical and technical data:

– height: 83 mm,
– diameter: 333 mm,
– EC weight: 4.45 kg,
– type of explosive: TNT. (Radić, 2001)

Figure 30 – M6 mine
Рис. 30 – Мина M6
Слика 30 – Мина M6

Conclusion

Due to the lack of literature as well as inadequate and sometimes poor technical quality translations of training materials, SAF and MoD members preparing to join MnOps face an increased risk of getting injured while performing their regular tasks.

Working with mines and other types of ordnance is very hard and complex psycho-physical work which requires, first of all, a very good theoretical knowledge of mines, physical fitness, but also practical mine clearance training. Work with mines in MnOps is made more difficult because the members of the SAF and the MoD are not sufficiently familiar with the tactical and technical characteristics of certain types of mines that can be found in the areas where MnOps are deployed.

Quality training, as a process with all its elements, is the basic measure for preventing accidents at work with mines. The base of any kind of training consists of equipment (disposable goods included), instructors and literature. Untrained personnel are a result of the lack of any of these training elements. This paper hopefully contributes to the expansion of the existing literature in this field.

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МИНЫ В ПРОЦЕССЕ МНОГОНАЦИОНАЛЬНЫХ ОПЕРАЦИЙ

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ВИД СТАТЬИ: практический опыт
ЯЗЫК СТАТЬИ: английский

Резюме:

Военнослужащие Министерства обороны Республики Сербия (далее по тексту: МОРС) и Вооруженных сил Республики Сербия (далее по тексту: ВСРС) с 26.06. 2012 года принимают участие в многонациональных операциях (далее по тексту: МнОп). На сегодняшний день в десяти МнОп Организации объединенных наций (далее по тексту: ООН), проводимых в разных странах мира, участвуют 247 представителей МОРС и ВСРС. Ключевой проблемой, возникающей в процессе осуществления МнОп ООН является процедура при обнаруживании минно-взрывных устройств (далее по тексту: МВУ). Главной проблемой при профессиональной подготовке служащих МОРС и ВСРС, направляемых в МнОп ООН является отсутствие достаточного количества квалифицированных инструкторов, так же как и учебных пособий. В статье представлен обзор доступной информации о МВУ минах − самом распространенном виде мин, обнаруженных на территоррии проводимых операций МнОп ООН. С целью преодоления минной опасности необходимо посвятить особое внимание профилактике, и профессиональной подготовке лиц-участников МнОп ООН. Статья основана на материалах доступной на данный момент литературы и опыта участников МОРС и ВСРС в МнОп ООН.

Ключевые слова: профилактика, многонациональные операции, безопасность, взрыв, мины.

МИНЕ НА ТЕРИТОРИЈИ ИЗВОЂЕЊА МУЛТИНАЦИОНАЛНИХ ОПЕРАЦИЈА

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ВРСТА ЧЛАНКА: искуства из праксе
ЈЕЗИК ЧЛАНКА: енглески

Сажетак:

Припадници Министарства одбране (МО) и Војске Србије (ВС) ангажују се у мултинационланим операцијама (МнОп) од 26. 6. 2002. године. Тренутно је ангажовано 247 припадника МО и ВС у укупно 10 МнОп Уједињених нација (УН) широм света, у различитим улогама. У току свог ангажовања они морају поштовати одређену процедуру приликом наиласка на неку врсту минско-експлозивних средстава (МЕС). Приликом припреме припадника МО и ВС за слање у МнОп УН јавља се, као један од основних проблема, мали број квалификованих и обучених инструктора, као и недостатак неопходне литературе. Чланак представља збирни преглед једне врсте МЕС – мина, односно најзаступљенијих врста мина које се могу наћи на неким од територија на којима се изводе МнОп. Ради превенције настанка незгода које проузрокују мине, посебна пажња мора се посветити обуци, односно припреми припадника МО и ВС за учешће у МнОп УН. Рад се превасходно заснива на тренутно расположивој литератури, али и на искуствима припадника МО и ВС који су били ангажовани у МнОп УН.

Кључне речи: *мине, употреба, обука, мултинационалне операције.*

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