



Landmines in Ukraine: Technical Briefing Note

April 2015

This Technical Briefing Note reviews the types of landmines documented in the Ukraine conflict since early 2014, specifically focusing on mines that can function as antipersonnel mines.

There is significant evidence from various locations that several types of landmines were available to parties to the conflict between Ukrainian government forces and Russian-backed rebels that erupted in early 2014, initially in Crimea in the south, then in Ukraine's eastern provinces of Donetsk and Luhansk.

While it is clear that antipersonnel mines were used on a limited and localized scale, it is not possible at this time to concretely determine the responsibility of any party for using antipersonnel mines or other devices such as victim-activated booby-traps prohibited by the 1997 Mine Ban Treaty.

Ukraine signed the Mine Ban Treaty prohibiting antipersonnel mines on February 24, 1999 and became a State Party on June 1, 2006. Russia has not joined the Mine Ban Treaty.

However, the numerous reports and images of antipersonnel mines and explosive devices capable of being victim-activated raises questions about the security of the stockpile of antipersonnel mines retained for training and research purposes by Ukraine under the treaty and the possible importation of banned mines from neighboring Russia since the beginning of the conflict in early 2014.

The International Campaign to Ban Landmines (ICBL), which Human Rights Watch co-founded and chairs, has expressed concern at reports of use and seizures of landmines in

Ukraine.¹ It urges parties to the conflict to ensure no antipersonnel mines are used by any actor and to destroy any antipersonnel mines they have seized or otherwise acquired.

Methodology

This Technical Briefing Note draws on evidence collected, including witness accounts, in the course of field investigations by Human Rights Watch researchers in Ukraine. It also reviews evidence from a number of other sources, including:

- Videos and photos taken by journalists on assignment in the region and shared on Twitter, Facebook, and directly with Human Rights Watch;²
- Threat information shared with Human Rights Watch by international demining experts and armament research specialists;
- Displays of weaponry seized by the Ukrainian government;³
- Landmine Monitor 2014 mine ban profile on Ukraine.⁴

¹ “Troubling Reports of Landmines Seizures and Use in Eastern Ukraine,” International Campaign to Ban Landmines (ICBL), July 8, 2014, <http://www.icbl.org/en-gb/news-and-events/news/2014/troubling-reports-of-landmine-seizures-and-use-in-eastern-ukraine.aspx> (accessed March 25, 2015).

² “Пророссийские террористы использовали в качестве склада оружия в Славянске церковь (+фото),” *Glavnoe*, July 6, 2014, (accessed March 25, 2015), <http://glavnoe.ua/news/n182919>.

³ “В Киеве показали захваченное у террористов оружие: Большинство “трофеев” российского производства. ФОТОрепортаж,” *Censor*, July 12, 2014, (accessed March 25, 2015), http://censor.net.ua/photo_news/293530/v_kieve_pokazali_zahvachennoe_u_terroristov_orujie_bolshinstvo_trofeev_rossiyskogo_proizvodstva_fotoreportaj.

⁴ ICBL, “Ukraine,” *Landmine Monitor 2014* (Geneva: ICBL 2014), http://www.the-monitor.org/index.php/cp/display/region_profiles/theme/3960.

Landmines in Ukraine



Photo (L to R): Unfuzed MON-50, MON-90, and OZM-72 mines in Ilovaïsk, eastern Ukraine. © Mark Hiznay/Human Rights Watch, October 11, 2014

As shown in the following table, Human Rights Watch has identified the presence of at least two types of antipersonnel mines, three types of MON-series directional fragmentation mines and OZM-72 bounding fragmentation mines that can function as antipersonnel mines depending on the type of fuze utilized, and PDM-1M anti-landing mines equipped with fuzes capable of being activated by the unintentional act of a person. Hand grenades emplaced with a trip wire attached, constituting a victim-activated explosive device, have also been documented in one instance. A vehicle-based mine scattering system called UMK that is capable of deploying both PFM antipersonnel and PTM anti-vehicle mines was sighted by the Associated Press in February 2015 near Debaltseve, but any deployment of mines by this weapon has not been confirmed.⁵ Additionally, several types of anti-vehicle mines have been documented including hand-emplaced and remotely delivered types.

⁵ Balint Szlanko, "Ukrainian UMZ mine-layer heading south on #Debaltseve road. Looks like they're mining the road. #Ukraine," Twitter post, February 10, 2015, 10:10 PM, <https://twitter.com/balintszlanko/status/568291459704733696>.

Most of the hand-emplaced landmines identified by Human Rights Watch as present in the Ukraine conflict are of Soviet-origin, with production markings from the 1970s and 1980s, and have been stockpiled by both Ukraine and Russia.

Landmines reported in Ukraine since 2014

Category	Designation	Origin	Type	Initiation
Antipersonnel	MON-50	Russia/USSR	Fragmentation	Tripwire/command
	MON-90	Russia/USSR	Fragmentation	Tripwire/command
	MON-100	Russia/USSR	Fragmentation	Tripwire/command
	OZM-72	Russia/USSR	Fragmentation	Tripwire/command
	PMN-4	Russia	Blast	Pressure
	POM-2/POM-2R	Russia/USSR	Fragmentation	Tripwire/self-destruct
Anti-vehicle	TM-62M	Russia/USSR	Blast	Pressure
	PTM1-G	Russia/USSR	Blast	Pressure/self-destruct
Anti-landing	PDM-1M	Russia/USSR	Blast	Tilt rod

MON-series and OZM-72 mines

There is a large number of reports and photographs of MON-series directional fragmentation mines and OZM-72 mines being sighted, seized, or recovered in eastern Ukraine. These multi-purpose antipersonnel munitions can be emplaced either in a command-detonated or victim-activated manner. When used in victim-activated mode with a mechanical pull, tension release, or seismic fuze, they are prohibited by the Mine Ban Treaty. These fuze types are illustrated in the following graphic.

Fuze options for MON-series and OZM-72 Mines



MUV

- Commonly fitted with a MD-5M detonator
- Operating loads
 - Pull: 1-3kg
 - Pressure: 2-15kg



NVU-P seismic initiation system

- Can control four MON-50 or OZM-72
- Detects footsteps at range of 15 meters
- Can self-destruct



NM initiator

- Fitted with a MD-5M detonator
- Allows for electrical initiation

Victim-activated ↑
↓ Command-detonated

Different fuze options for MON-series and OZM-72 mines. Photos courtesy of George Zahaczewsky, technical data from *Jane's Mines and Mine Clearance* 2008.

On November 17, 2014, a media report highlighted that Ukrainian security forces seized equipment purportedly in possession of a rebel sabotage group operating in government-controlled territory in the Kharkov region.⁶ This equipment included MON-50 and OZM-72 mines along with mechanical pull MUV fuzes, tripwire assemblies, and electrical initiation devices.

In November 2014, an international consultancy called Armament Research Services (ARES) published an extensive report called *Raising Red Flags* that documents the various types of weapons and munitions being used in the conflict in eastern Ukraine.⁷ It presents on page

⁶ “Особо опасная группа из 12 диверсантов, причастная ко взрыву в харьковском пабе, задержана, - СБУ. ФОТОрепортаж,” *Censor*, November 17, 2014 (accessed March 25, 2015), http://censor.net.ua/photo_news/312355/osobo_opasnaya_gruppa_iz_12_diversantov_prichastnaya_ko_vzryvu_v_harkovskom_pabe_zaderjana_sbu_fotoreportaj.

⁷ Armament Research Services, *Raising Red Flags: An Examination of Arms and Munitions in the Ongoing Conflict in Ukraine, 2014*, November 2014, <http://www.armamentresearch.com/ares-research-report-no-3-raising-red-flags-an-examination-of-arms-munitions-in-the-ongoing-conflict-in-ukraine-2014/>.

63 a photograph provided by Vice News reporter Harriet Salem of an OZM-72 mine fitted with a MUV-type mechanical pull fuze intended for use with a trip wire.

On October 11, 2014, Human Rights Watch researchers encountered four unfuzed OZM-72 mine bodies on the grounds of the primary school in the city of Ilovaisk in Donetsk province that had been ejected from a vehicle attacked while parked there in late August. Rebels clearing unexploded and abandoned ordnance from former battle areas removed the four mine bodies and indicated they would be added to their stockpiles. The rebels showed the researchers another undamaged unfuzed OZM-72 mine already in their possession in their vehicle.

A video produced by a Russian media outlet on September 14, 2014, shows rebel forces engaged in the clearance of explosive remnants of war shows at least six unfuzed OZM-72 mines, a MON-50 mine with an MUV-4 mechanical pull fuze attached, unfuzed MON-100 mines, and a type of smoke mine called UDSH (similar in external appearance to an anti-vehicle mine).⁸

Photos and information released on July 9, 2014 by the Ukrainian Ministry of Defense show two truckloads of crated weapons including MON-50 and MON-90 mines that it claimed were seized from the former headquarters of Russian-backed rebels in Sloviansk, Donetsk province.⁹

Ukraine declared a stockpile of 57,935 MON-series landmines in 2008. The numbers associated with each model of the MON family indicate the range, from 50 to 200 meters. According to *Jane's Mines and Mine Clearance* (2008), each model contains a specific number of pre-formed fragments that are projected horizontally:

- MON-50: 540 ball bearings or 485 pieces of 5mm chopped steel rod
- MON-90: 2,000 pieces of 7mm chopped steel rod
- MON-100: 400 pieces of 10mm chopped steel rod

⁸ “Сапёры Новороссии из Соколиной сотни,” September 14, 2014, video clip, YouTube, <https://www.youtube.com/watch?v=N41kC9ZrlGM> (accessed March 25, 2015).

⁹ “Спецназ нашел секретный штаб боевиков в Славянске: опубликованы фото и видео,” Glavred, July 9, 2014, (accessed March 25, 2015), <http://glavred.info/politika/specnaz-nashel-sekretnyy-shtab-boevikov-v-slavyanske-opublikovany-foto-i-video-284602.html>.

PMN-4 antipersonnel mine

The *Raising Red Flags* report released by ARES in November 2014, cites a video produced by a pro-rebel media source in July 2014, showing combatants associated with the rebel Zarya Battalion emplacing a PMN-4 anti-personnel mine, in conjunction with emplacing TM-62M anti-vehicle mines at an unknown location in eastern Ukraine.¹⁰ This type of mine has never been declared to be stockpiled by Ukraine and was only first publicly displayed by Russia in 1993.¹¹

POM-2/POM-2R antipersonnel mines

There have been unconfirmed references to the use of POM-2 antipersonnel mines on the night of August 8-9, 2014, including a variant designated POM-2R, at a checkpoint near the village of Melovoe in Luhansk province, near the Russian border. On August 22, 2014, Acting Chief of Engineers Colonel Gennady Kravchenko stated during the press conference the Ukrainian Army deminers had found POM-2 mines along with a number of booby-traps and improvised explosive devices equipped with victim-activated fuzes.¹² According to *Jane's Mines and Mine Clearance* (2008), the POM-2R is a factory-produced variant of the POM-2, designed for use in conjunction with the URP igniter assembly, allowing manual emplacement.

Booby-traps

The *Raising Red Flags* report by ARES presents on page 61 a photograph provided by Vice News reporter Harriet Salem of an RGD-5 hand grenade taped to a tree and fitted with an UZRGM type fuze affixed to a trip wire.¹³ Victim-activated booby-traps and other kinds of improvised explosive devices are banned by the 1997 Mine Ban Treaty.

¹⁰ “Жизнь батальона Заря Часть 7 Минирование Life of Zarya battalion,” July 2014, video clip, YouTube, <https://www.youtube.com/watch?v=PqSsgLNaJuo> (accessed March 25, 2015).

¹¹ “Противопехотная мина ПМН-4,” Saper, n.d., <http://www.saper.etel.ru/mines-2/pmn-4.html> (accessed March 25, 2015).

¹² “В ході АТО ми знаходимо приклади широкого застосування терористами-найманцями протипіхотних мін російського виробництва,” Ministry of Defence of Ukraine, August 22, 2014, <http://www.mil.gov.ua/news/2014/08/22/v-hodi-ato-mi-znahodimo-prikladi/> (accessed March 25, 2015).

¹³ Armament Research Services, *Raising Red Flags*.

PDM-1M anti-landing mines

A December 15, 2014 news broadcast on Ukrainian television showed Ukrainian troops emplacing numerous PDM-1M mines in the surf along a beach near the city of Mariupol on the Sea of Azov in southern Ukraine.¹⁴

According to *Jane's Mines and Mine Clearance* (2008), “The PDM anti-landing or river bottom mines were designed mainly to disable armoured fighting vehicles, landing craft and amphibious vehicles. They can be used in lakes or rivers, with a maximum velocity of 1.5 m/s and in coastal areas in depths of water ranging from 1 to 5 m.”

The PDM-1M version of the mine is only detonated when between 18-26 kilograms of force is applied to the VPDM-1M tilt rod fuze, an amount easily created by the actions of an adult.

The ICBL has consistently stated that mines equipped with fuzes that will detonate the mine due to the unintentional act of a person are considered to be antipersonnel mines and are banned by the Mine Ban Treaty. States Parties have discussed tilt rods, but have not specifically addressed “anti-landing” mines and the applicability of the Mine Ban Treaty to such mines. It is not known if other State Parties have such mines.

At best, this mining will create a hazard, which may require specialized clearance. It also raises questions about the Ukrainian government’s capacity of ensuring the effective exclusion of civilians from the effects of these mines.

TM-62M anti-vehicle mines

TM-62M is among the most common Russian anti-vehicle mines. The mine has a steel case, which makes it readily detectable, and has only been documented as being used with the MVCh-62 pressure fuze. Mines were shown being laid by hand, flush with the surface and camouflaged with a thin layer of grass, or simply laid on top of the surface.

The most recent use of TM-62M mines was documented in February 2015 as Ukrainian government forces apparently emplaced them on roads to cover their withdrawal from the besieged town of Debaltseve. Photographer Max Avdeev of the Meduza Agency published

¹⁴ “Наші військові замінували узбережжя Маріуполя,” December 15, 2014, video clip, YouTube, https://www.youtube.com/watch?v=a_yNpnhhUq8 (accessed March 25, 2015).

images of TM-62M mines hastily emplaced on the surface of the ground on the road between Debaltseve and Artemivsk. At another location in Debaltseve, and witnessed by the Associated Press, a rebel truck detonated a surface-laid TM-62M mine, killing one and injuring another combatant.¹⁵ A Russian news agency videotaped rebel trucks driving between surface-laid TM-62M mines at another location nearby.¹⁶

There were several reports of pressure-activated antivehicle mines used at several locations in eastern Ukraine in July-August 2014. Photos and information released on July 9, 2014 by the Ukrainian Ministry of Defense show TM-62M anti-vehicle mines that it said were seized from the former headquarters of pro-Russian separatists in Sloviansk, Donetsk province.¹⁷

On April 1, 2014 at a meeting of the Convention on Conventional Weapons (CCW) at the UN in Geneva, Ukraine accused Russia of laying TM-62 anti-vehicle mines and unidentified antipersonnel mines in Kherson province just north of Crimea. Russia denied that its armed forces had laid landmines and said, “The Self Defense forces of Crimea, before the referendum, placed the minefields with relevant markings.” Russia said, “They placed only signal mines and put proper signage around the fields” while in a meeting with the ICBL, Russian delegates said that “signal” mines were used, not “combat” mines.

PTM1-G anti-vehicle mine

PTM1-G is a remotely delivered anti-vehicle mine that has a soft plastic explosive filling and a hydraulic self-destruct mechanism. This mine is delivered from the 9M27K2 Uragan 220 mm multi-barrel rocket system, to a minimum range of 10 kilometers and a maximum range of 35 kilometers. Each 9M27K2 rocket contains 24 mines, although other deployment systems may be available.

A researcher from Human Rights Watch documented that PTM1-G anti-vehicle mines were scattered by Uragan rockets in an attack on the center of the Panteleimonivka, a rebel-controlled town south of Gorlovka at around 2:30 am on January 23, 2015. Although there

¹⁵ Peter Leonard and Dalton Bennett, “Debaltseve under rebel control, Cossack fighters celebrate,” *AP*, February 19, 2015, (accessed March 25, 2015), <http://apnews.myway.com/article/20150219/eu-ukraine-92eb2e75bc.html>.

¹⁶ “Ополченцы подорвались на mine, оставленной силовиками в Дебальцево,” *РенТВ*, February 19, 2015, (accessed March 25, 2015), <http://ren.tv/novosti/2015-02-19/opolchency-podorvalis-na-mine-ostavlennoy-silovikami-v-debalcevo>.

¹⁷ “Спецназ нашел секретный штаб боевиков в Славянске: опубликованы фото и видео,” *Glavred*.

were no casualties, craters and shattered windows were observed in several places around the town.

Local residents told Human Rights Watch that they heard many explosions at the time of the attack, but that some of the mines exploded only several hours later. One family living on Narodnaya Street said that they heard the first post-attack explosion around 2:30 pm on January 23, about 12 hours after the attack. Two mines fell in their backyard, but the family did not know that there were mines in their backyard until they exploded the next day. Deminers arrived on January 24 and detonated mines that had failed to self-destruct. According to the residents, the rockets came from a north-northwesterly direction, indicating that it was likely fired from government controlled territory.



(Left) A PTM-1 antivehicle mine awaiting clearance by deminers in Panteleimonivka. © Private, January 24, 2015. (Right) The cargo section of an 9M27K2 Uragan rocket that delivered PTM1-G antivehicle mines in Panteleimonivka. © Ole Solvang/Human Rights Watch, February 2015

Ukraine's response

In April and again in June 2014, the government of Ukraine stated that it has not used landmines in the conflict and accused Russian forces of laying landmines in Ukraine.¹⁸ On April 1, 2014 at a meeting of the CCW at the UN in Geneva, Ukraine accused Russian forces of laying unidentified antipersonnel mines in Kherson province just north of Crimea.

¹⁸ Submission by Ukraine, Mine Ban Treaty Third Review Conference, Maputo, Mozambique, June 18, 2014, <http://www.maputoreviewconference.org/fileadmin/APMBC-RC3/3RC-Ukraine-information.pdf>.

Russia's response

Russia denied that its armed forces had laid landmines and said, “The Self Defense forces of Crimea, before the referendum, placed the minefields with relevant markings.” Russia said that “they placed only signal mines and put proper signage around the fields.” In a meeting with the ICBL, Russian delegates said that “signal” mines were used, not “combat” mines.



An expended SM signal mine, a type of trip flare, found in Ilovaïsk, eastern Ukraine. © Mark Hiznay/Human Rights Watch, October 11, 2014

In December 2014, Ukrainian government officials informed Human Rights Watch representatives that “no banned weapons” have been used in the “Anti-Terrorist Operations Zone” by Ukrainian armed forces or forces associated with them, such as volunteer battalions. The Military Prosecutor confirmed that an assessment had been undertaken to ensure that stocks of KSF-1 and KSF-1S cartridges containing PFM-1 antipersonnel mines, BKF-PFM-1 cartridges with antipersonnel mines PFM-1S, and 9M27K3 rockets with antipersonnel mines PFM-1S are not operational, but rather destined for destruction in accordance with the Mine Ban Treaty.

In its 2009 Mine Ban Treaty transparency report, Ukraine declared that its MON-type and OZM-72 mines can be used in command-detonated mode in compliance with the Mine Ban Treaty, but said it planned to destroy the stocks, because they were excessive and unsuitable for use.¹⁹ Ukraine has never reported on any destruction of the MON-series or OZM-72 mines. The ICBL has asked Ukraine to confirm the status of the destruction planned for the MON-series and OZM-72 mines. It has sought assurances that victim-activated initiating devices such as pull or tension release mechanical fuzes used with MON-series and OZM-series mines have not issued to any armed force or institution in Ukraine.

In the 2009 transparency report, Ukraine declared a stockpile of 292,183 OZM-72 and 4,105 OZM-4 mines.²⁰ Once initiated, this “omnidirectional” mine leaps into the air where it detonates at the height of approximately one meter, sending metal fragments with lethal effect in all directions over a distance of 25-30 meters.

International response

In July 2014, the ICBL expressed concern at reports of use and seizures of landmines.²¹ It strongly urged all parties to the conflict to ensure no antipersonnel mines are used by any actor and to destroy any antipersonnel mines they have seized or otherwise acquired.

Several states expressed concern at the reported landmine use in Ukraine at the CCW in April 2014, including Canada, Norway, and the United States. Ukraine did not attend the Mine Ban Treaty’s Third Review Conference in Mozambique in June 2014, where a number of states expressed concern at reported landmine use in Ukraine.

¹⁹ Ukraine, Mine Ban Treaty Article 7 Transparency Report, Form B, April 20, 2009, [http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/5BC4401D413D7D1BC125759800274B80/\\$file/Ukraine+2008+II.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/5BC4401D413D7D1BC125759800274B80/$file/Ukraine+2008+II.pdf).

²⁰ Ibid.

²¹ “Troubling Reports of Landmines Seizures and Use in Eastern Ukraine,” ICBL.