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Research Notes MEASURES & PROGRAMMES

Taking Stock of Excess Stockpiles: UEMS in South-east Europe

Numerous unplanned explosions at munitions sites (UEMS)[1] have drawn increasing public attention to the dangers associated with the improper management and storage of explosive materials. According to the Small Arms Survey (2013), more than 500 unplanned explosions occurred between 1979 and 2013 in 100 countries and 19 of 22 UN-designated sub-regions.[2] South-east Europe (SEE)[3] has been particularly affected: seven countries in this sub-region account for just over 10 per cent of the total events recorded during this 35-year period.

This concentration of UEMS in SEE has translated into increased political will by national governments to tackle the problem, resulting in the implementation of various stockpile-reduction programmes, either by individual governments in collaboration with various regional bodies or through the Regional Approach to Stockpile Reduction (RASR) Initiative.

This Research Note is regionally focused, but globally relevant. It demonstrates the widespread occurrence of UEMS in SEE; illustrates their socio-economic impact by drawing on specific examples in Albania, Bulgaria, and Serbia; and highlights the benefits of political will, international assistance, and regional cooperation in addressing the threat of UEMS.

UEMS in South-east Europe

As of December 2013, and with the exception of Macedonia and Romania, there were 51 UEMS incidents in SEE. Although a large proportion of these explosions took place in Albania in 1997, more than half occurred after 2000 (see Table 1). This indicates that the occurrence of armed conflict in the region may not be as important for understanding the large number of UEMS as might be expected. However, these figures probably underestimate the impact of unplanned explosions in the region, because incidents are often not reported or not made public.[4]

UEMS take place at both state-owned and private munition sites, and occur for several reasons (Berman, Gobinet, and Reina, 2012, p. 2). In SEE, more than two-thirds of the explosions occurred at state-owned sites, mainly at military storage facilities. Only two occurred at police depots. According to the Small Arms Survey (2013), prior to 2000 the primary cause of unplanned explosions was criminal activity (such as theft) resulting from poor security at ammunition storage sites. After 2000, UEMS were more the result of negligence during the handling of ammunition and poor storage safety, both of which point to deficiencies in the technical knowledge of staff and lax safety standards.

In SEE, private contractors play an increasing role in surplus ammunition demilitarization (Gobinet, 2012, p. 26). Despite many benefits, privatization can be problematic. About one-quarter of all UEMS incidents occurred at non-state, privately owned manufacturing and/or demilitarization facilities. Nine of these occurred after 2010 and resulted from failures to protect ammunition from extreme weather and external fire, criminal activity, or improper handling during processing (Small Arms Survey, 2013). The recent increase in the number of incidents at non-state facilities suggests there is room to improve procedural standards and increase oversight of the industrial demilitarization process (Gobinet, 2013, p. 203).

Cost and consequences: case studies

UEMS have various direct and indirect consequences (see Figure 1). The 51 UEMS incidents in SEE resulted in more than 700 casualties (fatalities and injuries).[5] In addition to the casualties and extensive damage to public and private infrastructure, the indirect costs in terms of health care, loss of income, reconstruction, explosive ordnance disposal (EOD), and environmental damage were significant. The RASR Special Report on the costs and consequences of UEMS attempted to shed light on the direct and indirect impacts of UEMS incidents through three detailed case studies in Albania, Bulgaria, and Serbia (Lazarevic, 2012).

The following sections summarize the report's main findings.

Table 1. **UEMS in countries participating in the RASR Initiative, 1979–2013***

Country	Date	Location	Owner/manager	Deaths	Injured
Albania	20.02.97	Suc	State (military)	1	2
	28.02.97	Qafe Shtame	State (military)	23	3
	11.03.97	Kordhoce	State (military)	1	2
	12.03.97	Laci	State (military)	2	9
	20.03.97	Peshkopi	State (military)	0	3
	20.03.97	Pilur-Vlore	State (military)	2	0
	--.03.97	Gjegjan	State (military)	30	3
	--.03.97	Shen Vasil/Sasaj	State (military)	3	0
	05.04.97	Fushe-Kruje	State (military)	n/a	n/a
	07.04.97	Ura e Gjadrit	State (military)	2	6
	13.04.97	Picar	State (military)	5	19
	18.04.97	Gjeroven	State (military)	1	5
	24.04.97	Malesia Lezhe	State (military)	3	0
	27.04.97	Palikesht	State (military)	2	14
	30.04.97	Burrel	State (military)	27	n/a
	05.05.97	Picar	State (military)	3	14
	15.05.97	Gjirokaster	State (military)	1	n/a
	18.06.97	Mbreshtan	State (military)	7	1
	26.06.97	Klos	State (military)	3	1
	09.07.97	n/a	n/a	16	n/a
	06.05.06	Tepelena	State (military)	2	3
	15.03.08	Gërdec	Non-state (company)	26	300
	06.01.09	Polican	State (military)	1	1
	27.04.11	Polican	State (military)	1	3
Bosnia and Herzegovina	--.--.00	Bihac	State (military)	n/a	n/a
	20.06.03	Rabic	State (military)	2	0
Bulgaria	09.07.00	Ivanovo	n/a	n/a	n/a
	03.07.08	Chelopechene	State (military)	0	1
	10.08.08	Kazanlak	Non-state (company)	0	0
	03.02.10	Gorni Lom	Non-state (company)	0	4
	17.05.10	Sofia	State (military)	0	0
	12.11.11	Lovnidol	Non-state (company)	0	0
	11.01.12	Charkovo	Non-state (company)	1	1
	05.06.12	Straldzha	Non-state (company)	3	9
	11.09.12	Kazanlak	Non-state (company)	0	0
Croatia	07.04.94	Zagreb	State (military)	n/a	17
	23.08.01	Osijek	State (police)	0	3
	14.09.11	Pađene	State (police)	0	0
Montenegro	08.07.06	Vir	Non-state (company)	0	50
	07.03.10	Niksic	Non-state (company)	0	3
Serbia	--.--.94	Lisičji	State (military)	n/a	n/a
	21.06.96	Baric	State (other)	3	3
	22.01.03	Cacak	State (military)	0	3
	29.05.06	Baric	State (other)	3	1
	19.10.06	Paracin	State (military)	0	23
	24.08.07	Paracin	State (military)	0	0
	03.09.09	Užice	Non-state (company)	7	15
	10.05.10	Valjevo	Non-state (company)	0	2
	27.12.10	Cacak	Non-state (company)	0	0
	16.12.13	Cacak	Non-state (company)	2	2
Slovenia	--.--.86	Grgar	State (military)	13	n/a
Total		**51 UEMS**		**196**	**526**

*** Note:** 'n/a' means that data is either unavailable or unrecorded. Double dashes (--) in dates indicate that precise dates are unavailable.

Chelopechene and Gorni Lom in Bulgaria. The main explosion at the government-controlled ammunition depot in Chelopechene occurred on 3 July 2008, injuring one person and destroying 1,494 tonnes of ammunition and explosives. Indirect impacts of the explosion included the blocking of main transit routes, the closure of Sofia airport, the evacuation of 2,000 residents, the disruption of telephone services and power supplies, and the environmental impact resulting from the spread of approximately 3,000 tonnes of unexploded ordinance (UXO). Excluding personnel costs that were borne by the Bulgarian Ministry of Defence (MoD), *total expenditure for the Chelopechene clean-up operations amounted to at least USD 4.5 million. When the wider socio-economic costs are included, this figure jumps to about USD 7.5 million. This is eight times more than the regular disposal of the 1,500 tonnes of surplus ammunition would have cost.*

The explosion at the privately owned ammunition-manufacturing company Midzhur in Gorni Lom occurred on 3 February 2010. The immediate impacts of the explosion were injuries to three people, and the destruction of 10 tonnes of ammonite, a number of anti-personnel landmines, and various types of ammunition. The indirect impacts included the loss of employment for about 70–120 individuals working at the ammunition plant and a general decrease in trust among the local community in the site's management and public authorities. Although compensation for those people who lost their jobs was promised, at the time of writing it was not clear how much was provided. Consequently, the overall financial cost of the incident is unclear.

Paraćin and Užice in Serbia. On 19 October 2006 an unplanned explosion took place at the Serbian Armed Forces munitions storage facility in Paraćin, caused by the chemical decomposition of double-based propellant, most likely as a result of improper storage. Immediate impacts of the explosion included the destruction of material stored at the site; 23 injuries; the polluting of about 3,000 hectares of land with about 90,000 UXO; the destruction of 600 buildings; and

damage to 12 schools, about 4,740 buildings in Paraćin, and 2,000 in the nearby town of Ćuprija. Broader socio-economic impacts included the closure of the local transit highway and railway system, and the evacuation of about 80 individuals from the area. *The overall cost of the incident was about USD 10 million, with USD 7.5 million spent on the immediate clean-up of the explosion and the rest spent on infrastructure repair and emergency aid.* There was also a USD 19.8 million loss in trade, while the facility's commander was blamed for the incident and imprisoned.

The explosion that took place at the Prvi Partizan Užice munitions factory in Užice on 3 September 2009 did not involve a storage site. Nevertheless, the event resulted in seven deaths and 14 injuries. Since the plant is located underground about 3 km from the city, the physical damage resulting from the explosion was limited to the plant. Compensation paid to the families of those who lost their lives totalled about USD 0.5 million, while five company employees were indicted in connection with the incident.

Gërdec in Albania. The Gërdec explosion occurred during surplus ammunition disposal operations conducted by a private contractor hired by the Albanian MoD. The initial explosion took place at noon on 15 March 2008, propelling thousands of unexploded artillery shells, mortar bombs, grenades, and rounds of small arms ammunition up to 5 km from the site. Explosions continued for about 14 hours, significantly affecting surrounding towns. The direct impacts of the explosion were extremely serious: 26 individuals were killed and about 300 injured, 400 residential houses were heavily damaged and 4,200 damaged, and 4 nearby villages were contaminated with around 9,000 tonnes of UXO.

The indirect impacts of the explosion included the closure of the Durrës-Tirana motorway for 25 hours and the suspension of flights to Tirana airport. The consequences of the explosion even affected the political elite, leading to a high-level resignation and the imprisonment of former officials. The financial impact of the incident was large: *while the estimated costs of the clean-up were about USD 10.2 million, the wider socio-economic costs of the incident increased this figure to USD 29 million. Preventing the accident would have cost less than USD 6.6 million.*

Figure 1. **Selected direct and indirect costs related to UEMS**

	Immediate costs/impacts	Indirect actions/impacts
Human costs	• Loss of life and injury	• Compensation for lost lives and personal injuries (physical and psychological) • Indirect deaths or injuries (due to UXO, shock, post-blast heart attacks, etc.)
Material damage	Damage to: • the (ammunition) site • private and public property • infrastructure	• Compensation for material damage • Replacement of functioning weapons/stable and operational ammunition lost • Mobilization of experts to assess damage to private and public property and infrastructure • Cost of clean-up and repairs
Environmental impact	• Contamination of local environment with UXO, arsenic, copper, iron, lead, and mercury	• Subsequent EOD operations • Production and distribution of risk-education material • Creation of safety zones • Subsequent analysis of air, water, and soil pollution • Lost harvests due to contamination of farm land

▼

	Further consequences

Socio-economic costs	• Emergency response (police, army, fire fighters)
	• Emergency evacuation operations
	• Temporary shelter provision (such as IDP camps)
	• Direct employee income loss if the depot was destroyed (temporary or permanent)
	• Wider loss of income due to:
	  ◦ temporary closure of surrounding businesses and schools
	  ◦ companies having to suspend deliveries of goods and material to a site that is no longer operational
	  ◦ closure of airports and roads
	  ◦ loss of local tourism
	• Loss/disruption of national infrastructure (power plants, mobile/landline phone networks, water-supply facilities, etc.)
	• Investigations to determine the cause of the incident and subsequent trials that can last several years

▼

Politico-military impacts	• Possible resignations by politicians/authorities/plant management • Loss of confidence in the government/authorities/plant management • Potential impact on the country's credit rating

Source: Adapted from Lazarevic (2012, pp. 40–41)

RASR Initiative

There is strong political will among SEE countries to tackle the problem of UEMS, at both the national and regional levels. The continued participation of these countries in the Regional Approach to Stockpile Reduction (RASR) Initiative, for instance, underscores the importance that they attribute to physical security and stockpile management (PSSM) as a means of preventing future UEMS incidents or reducing the damage such incidents cause.[6]

Through the RASR Initiative, and in collaboration with international donors and regional organizations,[7] affected governments have sought to tackle the problem of UEMS. These efforts not only go a long way towards building transparency, but also give states the ability to capitalize on lessons learned and share information regarding ammunition management best practice, both of which increase regional cooperation.

Conclusion

The countries of SEE acknowledge the costs and consequences of UEMS and have made serious efforts to address the causes. Political priorities, financial constraints, and public opinion have shaped each country's demilitarization capabilities and capacities slightly differently. Nevertheless, there is strong political will to tackle UEMS. With the help of a number of international and regional organizations, SEE countries have made important progress towards increasing transparency and regional cooperation, and taken concrete steps to destroy excess and obsolete ammunition and safeguard their stockpiles (Gobinet, 2012).

Current efforts seek to improve the sustainability of ammunition stockpile management policies in SEE. The recent rise in UEMS incidents, particularly at private manufacturing and/or demilitarization facilities, highlights the importance of contractor selection, effective oversight, and quality control. Further research into and analysis of UEMS can improve national policymaking and contribute to bilateral or regional cooperation to dispose of surpluses. Participation in the RASR Initiative is important in this regard. Through it SEE states can build transparency, facilitate the sharing of knowledge, capitalize on lessons learned, and share information regarding ammunition management best practice, all of which increase regional cooperation.

Although UEMS are a global problem, much can be learned from examining the direct and indirect effects of selected incidents and how states deal with them. The insights obtained from examining the UEMS incidents that occurred in SEE can inform PSSM policies in other countries and regions that possess excess stockpiles. The RASR Initiative can also serve as a template for fostering cooperation, transparency, and confidence building in other regions where countries hold large quantities of excess and obsolete ammunition. ■

Notes

1 UEMS are accidental explosions of abandoned, damaged, improperly stored, or properly stored stockpiles of munitions at a munitions site. For further elaboration on the definition and cases of UEMS, see Small Arms Survey (2013).

2 The three sub-regions that did not experience UEMS are all located in Oceania (Berman and Reina, 2014, p. 14).

3 For the purposes of this publication, SEE refers to the following nine RASR-participating countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Montenegro, Romania, Serbia, and Slovenia.

4 In addition, the 51 UEMS incidents do not include attacks on depots that took place during the armed conflicts in the former Yugoslavia between 1991 and 1995.

5 The number of actual casualties is almost certainly considerably higher than the figures recorded in Small Arms Survey (2013), which often relies on media reports of the explosions.

6 Six RASR workshops were held between May 2009 and April 2013 (a seventh is planned for May 2014). For more information, see <http://www.rasrinitiative.org>.

7 Including NATO, OSCE, UNDP, ITF, RACVIAC, and SEESAC.

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This Research Note draws heavily on Lazarevic (2012), Berman, Gobinet, and Reina (2012), and the forthcoming Berman and Reina (2014). For more information, see RASR (n.d.).

For more information about stockpile management and security, please visit: <www.smallarmssurvey.org/?pssm.html>

About the Small Arms Survey

The Small Arms Survey serves as the principal international source of public information on all aspects of small arms and armed violence, and as a resource centre for governments, policy-makers, researchers, and activists. The Small Arms Survey, a project of the Graduate Institute of International and Development Studies, Geneva, hosts the Geneva Declaration Secretariat. For more information, please visit: www.smallarmssurvey.org

About the Regional Approach to Stockpile Reduction (RASR) Initiative

The RASR Initiative addresses the threats posed by excess, unstable, and loosely secured stockpiles of conventional weapons and munitions. It encourages affected governments and partner organizations to develop a regional approach to stockpile management and destruction by building local capacity, sharing best practices, and synchronizing resources in order to maximize efficiency. Ultimately, it aims to prevent disastrous explosions or destabilizing diversions of conventional weapons and munitions. For more information, please visit: www.rasrinitiative.org

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