



Cluster Munitions: Background and Issues for Congress

Andrew Feickert

Specialist in Military Ground Forces

Paul K. Kerr

Analyst in Nonproliferation

June 27, 2012

Congressional Research Service

7-5700

www.crs.gov

RS22907

CRS Report for Congress

Prepared for Members and Committees of Congress

Summary

Cluster munitions are air-dropped or ground-launched weapons that release a number of smaller submunitions intended to kill enemy personnel or destroy vehicles. Cluster munitions were developed in World War II and are part of many nations' weapons stockpiles. Cluster munitions have been used frequently in combat, including the early phases of the current conflicts in Iraq and Afghanistan. Cluster munitions have been highly criticized internationally for causing a significant number of civilian deaths, and efforts have been undertaken to ban and regulate their use. The Department of Defense (DOD) continues to view cluster munitions as a military necessity but has instituted a policy to reduce the failure rate of cluster munitions to 1% or less by 2018.

There are two major international initiatives to address cluster munitions: the Convention on Cluster Munitions (CCM) and negotiations under the U.N. Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons (CCW). The Obama Administration has reiterated U.S. opposition to the CCM, which entered into force August 1, 2010, but is participating in negotiations regarding cluster munitions under the CCW.

Contents

What Are Cluster Munitions?	1
History	1
Cluster Munitions Criticisms	2
Failure Rate	2
Lack of Self-Destruct Capability	2
International Attempts to Regulate Use	3
U.N. Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons (CCW).....	3
Convention on Cluster Munitions (CCM).....	3
Current U.S. Policy on Cluster Munitions	4
Department of Defense (DOD) Policy on Cluster Munitions	5
DOD Efforts to Reduce Unexploded Ordnance Rates for Its Cluster Munitions	5
Potential Issues for Congress	6
Cluster Munitions in an Era of Precision Weapons	6
Weapons in Lieu of Cluster Munitions.....	6
Is the CCW a Viable Forum for Regulating Cluster Munitions?.....	6
Legislation in the 111 th Congress.....	7
Consolidated Appropriations Act, 2010	7
Legislation in the 112 th Congress	7

Contacts

Author Contact Information.....	8
---------------------------------	---

What Are Cluster Munitions?¹

Cluster munitions are weapons that open in mid-air and disperse smaller submunitions—anywhere from a few dozen to hundreds—into an area. They can be delivered by aircraft or from ground systems such as artillery, rockets, and missiles. Cluster munitions are valued militarily because one munition can kill or destroy many targets within its impact area, and fewer weapons systems are needed to deliver fewer munitions to attack multiple targets. Cluster munitions also permit a smaller force to engage a larger adversary and are considered by some an “economy of force” weapon. Many cluster munitions rely on simple mechanical fuzes that arm the submunition based on its rate of spin and explode on impact or after a time delay. A newer generation of sensor-fuzed submunitions is being introduced by a number of nations to improve the munitions’ and submunitions’ accuracy and to reduce the large number of residual unexploded submunitions. These sensor-fuzed submunitions are designed to sense and destroy vehicles without creating an extensive hazard area of unexploded submunitions.

History²

Cluster bombs were first used in World War II, and inclusive of their debut, cluster munitions have been used in at least 21 states by at least 13 different countries. Cluster munitions were used extensively in Southeast Asia by the United States in the 1960s and 1970s, and the International Committee of the Red Cross (ICRC) estimates that in Laos alone, 9 million to 27 million unexploded submunitions remained after the conflict, resulting in over 10,000 civilian casualties to date. Cluster munitions were used by the Soviets in Afghanistan, by the British in the Falklands, by the Coalition in the Gulf War, and by the warring factions in Yugoslavia. In Kosovo and Yugoslavia in 1999, NATO forces dropped 1,765 cluster bombs containing approximately 295,000 submunitions. From 2001 through 2002, the United States dropped 1,228 cluster bombs containing 248,056 submunitions in Afghanistan, and U.S. and British forces used almost 13,000 cluster munitions containing an estimated 1.8 million to 2 million submunitions during the first three weeks of combat in Iraq in 2003. Senior U.S. government officials have stated that the United States has not used cluster munitions since 2003, during the intervention in Iraq.³ It is widely believed that confusion over U.S. cluster submunitions (BLU-97/B) that were the same color and size as air-dropped humanitarian food packets played a major role in the U.S. decision to suspend cluster munitions use in Afghanistan but not before using them in Iraq.

In 2006, Israeli use of cluster munitions against Hezbollah forces in Lebanon resulted in widespread international criticism. Israel was said to have fired significant quantities of cluster munitions—primarily during the last 3 days of the 34-day war after a U.N. cease fire deal had been agreed to⁴—resulting in almost 1 million unexploded cluster bomblets to which the U.N.

¹ Information in this section unless otherwise noted is from Mark Hiznay, “Operational and Technical Aspects of Cluster Munitions,” United Nations Institute for Disarmament Research Disarmament Forum,” 2006, pp. 15-25.

² Ibid.

³ Stephen D. Mull, Acting Assistant Secretary of State for Political-Military Affairs, U.S. Cluster Munitions Policy, On-the-Record Briefing, Washington, D.C., May 21, 2008.

⁴ Scott Peterson, “Cluster Bombs: A War’s Perilous Aftermath,” *Christian Science Monitor*, February 7, 2007, and “Israel Criticized for Cluster Bombs,” *Los Angeles Times*, February 1, 2008.

attributed 14 deaths during the conflict.⁵ Reports maintain that Hezbollah fired about 113 “cluster rockets” at northern Israel and, in turn, Israel’s use of cluster munitions supposedly affected 26% of southern Lebanon’s arable land and contaminated about 13 square miles with unexploded submunitions.⁶ One report states that there was a failure rate of upwards of 70% of Israel’s cluster weapons.⁷

Cluster Munitions Criticisms

The fundamental criticisms of cluster munitions are that they disperse large numbers of submunitions imprecisely over an extended area, that they frequently fail to detonate and are difficult to detect, and that submunitions can remain explosive hazards for decades. Civilian casualties are primarily caused by munitions being fired into areas where soldiers and civilians are intermixed, inaccurate cluster munitions landing in populated areas, or civilians traversing areas where cluster munitions have been employed but failed to explode. Two technical characteristics of submunitions—failure rate and lack of a self-destruct capability—have received a great deal of attention.

Failure Rate⁸

There appear to be significant discrepancies among failure rate estimates. Some manufacturers claim a submunition failure rate of 2% to 5%, whereas mine clearance specialists have frequently reported failure rates of 10% to 30%. A number of factors influence submunition reliability. These include delivery technique, age of the submunition, air temperature, landing in soft or muddy ground, getting caught in trees and vegetation, and submunitions being damaged after dispersal, or landing in such a manner that their impact fuzes fail to initiate.

Lack of Self-Destruct Capability

Submunitions lacking a self-destruct capability—referred to as “dumb” munitions—are of particular concern because they can remain a hazard for decades, thereby increasing the potential for civilian casualties. Some nations are developing “smart” or sensor-fuzed weapons with greater reliability and a variety of self-destruct mechanisms intended to address the residual hazard of submunitions.⁹ Experts maintain that self-destruct features reduce—but do not eliminate—the unexploded ordnance problem caused by cluster munitions and that the advantage gained by using “smart” cluster munitions is negated when high-failure rate and/or “dumb” cluster munitions are used in the same area.¹⁰ For some nations, replacing “dumb” and high-failure rate

⁵ “Major Violations on Both Sides in Israel-Lebanon Conflict, Say UN Experts,” United Nations Office at Geneva News & Media, October 4, 2006.

⁶ Scott Peterson.

⁷ *Ibid.* Failure rate as described here is either a failure to detonate on impact or a failure to detonate after a predetermined time delay.

⁸ Unless otherwise noted, information in this section is from Mark Hiznay, p. 22.

⁹ Gayle S. Putrich, “Cluster-Bomb Ban Exempts Some Smart Munitions,” *Defense News*, June 2, 2008, p. 4.

¹⁰ Hiznay, p. 23.

cluster munitions may not be an option—China, Russia, and the Republic of Korea maintain that they cannot afford to replace all current submunitions with “smart” submunitions.¹¹

International Attempts to Regulate Use

U.N. Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons (CCW)

In an effort to restrict or ban specific types of weapons used in armed conflicts, 51 states negotiated the CCW in 1980.¹² When the treaty entered into force in December 1983, it applied only to incendiary weapons, mines and booby-traps, and weapons intended to cause casualties through very small fragments. Since then, some states parties have added provisions through additional protocols to address other types of weapons. Negotiations on cluster munitions are carried out under Protocol V on Explosive Remnants of War. Some have characterized the CCW as “slow-moving,” “ponderous,” and “lacking life.”¹³

Acting in accordance with the recommendation of a group of experts established during the 2006 CCW review conference, states-parties to the convention decided in 2007 to “negotiate a proposal to address urgently the humanitarian impact of cluster munitions.”¹⁴ Negotiations took place in 2008 and 2009, but the parties have not reached agreement on a new proposal. The experts group continued negotiations in 2011 “informed by” a Draft Protocol on Cluster Munitions.¹⁵ However, the CCW states-parties were unable to reach agreement on a protocol during their November 2011 review conference.

Convention on Cluster Munitions (CCM)¹⁶

Described as “frustrated with the CCW process,” a number of CCW members—led by Norway—initiated negotiations in 2007 outside of the CCW to ban cluster munitions.¹⁷ On May 30, 2008, they reached an agreement to ban cluster munitions.¹⁸ The United States, Russia, China, Israel,

¹¹ Ibid.

¹² Information in this section is from an Arms Control Association Fact Sheet. “Convention on Certain Conventional Weapons Convention (CCW) at a Glance,” Washington, D.C., October 2007.

¹³ “A Change of Heart, or of Tactic?, Cluster Munitions,” *The Economist*, June 23, 2007.

¹⁴ Report from the November 2007 meeting of states-parties to the CCW, December 3, 2007. Available at [http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/029247C7A309EAC2C12573CF005B93B6/\\$file/CCW+MSP+2007+5+E.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/029247C7A309EAC2C12573CF005B93B6/$file/CCW+MSP+2007+5+E.pdf).

¹⁵ “Cluster Munitions Remain the Focus of CCW Ahead of the 2011 Review Conference,” December 3, 2010. Available at http://www.unog.ch/80256EDD006B9C2E/%28httpNewsByYear_en%29/33009AD680B169BDC12577EE003F9762?OpenDocument. A copy of the Draft Protocol is available at <http://daccess-ods.un.org/TMP/834449.529647827.html>.

¹⁶ For detailed information on the Convention on Cluster Munitions, see <http://www.clustermunitionsdublin.ie/documents.asp>.

¹⁷ Arms Control Association Fact Sheet. “Convention on Certain Conventional Weapons Convention (CCW) at a Glance,” Washington, D.C., October 2007.

¹⁸ Kevin Sullivan and Josh White, “111 Nations, Minus the U.S., Agree to Cluster-Bomb Ban,” *Washington Post*, May 29, 2008.

Egypt, India, and Pakistan did not participate in the talks or sign the agreement. During the Signing Conference in Oslo on December 3-4, 2008, 94 states signed the convention and 4 of the signatories ratified the convention at the same time.¹⁹ China, Russia, and the United States abstained, but France, Germany, and the United Kingdom were among the 18 NATO members to sign the convention.²⁰ The convention was to enter into force six months after the deposit of the 30th ratification. The United Nations received the 30th ratification February 16, 2010, and the convention entered into force August 1, 2010. As of April 25, 2012, 39 states had signed the convention and 72 had ratified it.

The Convention on Cluster Munitions (CCM), *inter alia*, bans the use of cluster munitions, as well as their development, production, acquisition, transfer, and stockpiling.²¹ The convention does not prohibit cluster munitions that can detect and engage a single target or explosive submunitions equipped with an electronic self-destruction or self-deactivating feature²²—an exemption that seemingly permits sensor-fuzed or “smart” cluster submunitions. U.S. officials were concerned that early versions of the CCM would prevent military forces from non-states parties from providing humanitarian and peacekeeping support and significantly affect NATO military operations, but the version signed May 30, 2008, does permit states parties to engage in military cooperation and operations with non-states parties (Article 21, Paragraph 3).

Current U.S. Policy on Cluster Munitions

Then-Acting Assistant Secretary for Political-Military Affairs Stephen Mull stated in May 2008 that the United States relies on cluster munitions “as an important part of our own defense strategy,” and that Washington’s preferred alternative to a ban is “to pursue technological fixes that will make sure that these weapons are no longer viable once the conflict is over.”²³ U.S. officials note that:

Cluster munitions are available for use by every combat aircraft in the U.S. inventory, they are integral to every Army or Marine maneuver element and in some cases constitute up to 50 percent of tactical indirect fire support. U.S. forces simply can not fight by design or by doctrine without holding out at least the possibility of using cluster munitions.²⁴

The United States also maintains that using cluster munitions reduces the number of aircraft and artillery systems needed to support military operations, and that if cluster munitions were eliminated, significantly more money would need to be spent on new weapons systems, ammunition, and logistical resources. Officials further suggest that if cluster munitions were eliminated, most militaries would increase their use of massed artillery and rocket barrages, which would likely increase destruction of key infrastructure.

¹⁹ Convention on Cluster Munitions Homepage <http://www.clusterconvention.org/>, accessed January 28, 2009.

²⁰ Marina Malenic, “Dozens of Nations Sign Cluster Bomb Treaty, U.S. Begins Upgrading Related Technology,” *Defense Daily*, December 5, 2008.

²¹ Diplomatic Conference for the Adoption of a Convention on Cluster Munitions, Convention on Cluster Munitions, Dublin, Ireland, May 30, 2008, <http://www.clustermunitionsdublin.ie/documents.asp>.

²² *Ibid.*

²³ Mull, 2008.

²⁴ Richard Kidd, Director of the Office of Weapons Removal and Abatement, U.S. Department of State, “Is There a Strategy for Responsible U.S. Engagement on Cluster Munitions ?” April 28, 2008.

Department of State Legal Adviser Harold Koh stated November 9, 2009, that the United States has determined that its “national security interests cannot be fully ensured consistent with the terms” of the CCM.²⁵ However, the United States has agreed to address the humanitarian aspects of cluster munitions use in the CCW.²⁶ Koh stated that “the United States remains committed to negotiate a legally binding Protocol on Cluster Munitions in the CCW.” The United States was originally against any CCW negotiations on cluster munitions, but dropped its opposition in June 2007.

Department of Defense (DOD) Policy on Cluster Munitions²⁷

The United States said in a November 25, 2012, statement that the United States would continue to implement the DOD policy on cluster munitions issued June 19, 2008, which recognizes the need to minimize harm to civilians and infrastructure but also reaffirms the contention that “cluster munitions are legitimate weapons with clear military utility.” The central directive in the Pentagon’s new policy is the unwaiverable requirement that cluster munitions used after 2018 must leave less than 1% of unexploded submunitions on the battlefield. Prior to 2018, U.S. use of cluster munitions with a greater than 1% unexploded ordnance rate must be approved by Combatant Commanders. This policy will permit the development of a new generation of cluster munitions less dangerous to civilians. While such a high level of performance might be achievable under controlled laboratory conditions, previously mentioned factors such as delivery technique, landing in soft or muddy ground, getting caught in trees and vegetation, and submunitions being damaged after dispersal or landing could result in an appreciable number of dud submunitions, even if they have a self-deactivation feature.

DOD Efforts to Reduce Unexploded Ordnance Rates for Its Cluster Munitions

DOD and the services have been and are currently involved in efforts to reduce cluster munitions failure rates. The Army’s Alternative Warhead Program (AWP) is intended to assess and recommend new technologies to reduce or eliminate cluster munitions failure rates.²⁸ The AWP program is viewed as particularly relevant, as the Pentagon estimates that “upward of 80 percent of U.S. cluster munitions reside in the Army artillery stockpile.”²⁹ In December 2008, the Army decided to cease procurement of a Guided Multiple Launch Rocket System (GMLRS) warhead—the Dual-Purpose Improved Conventional Munition (DPICM) warhead—because its submunitions had a dud rate up to 5%.³⁰ The Air Force is also acquiring cluster munitions that

²⁵ “Opening Statement for the United States Delegation by Harold Hongju Koh, Legal Adviser, United States Department of State, at the Third Conference of the High Contracting Parties to Protocol V on Explosive Remnants of War.” November 9, 2009.

²⁶ Kidd, 2008.

²⁷ Information in this section is from DOD Policy on Cluster Munitions and Unintended Harm to Civilians, June 19, 2008.

²⁸ Daniel Wasserbly, “Army Warhead Program to Reduce Dud Rate for Cluster Munitions,” *InsideDefense.com*, July 21, 2008.

²⁹ *Ibid.*

³⁰ Kate Brannen, “Army Will Stop Procurement of GMLRS-DPICM After Final Deliveries,” *InsideDefense.com*, December 1, 2008.

comply with the less than 1% failure rate—the CBU-97 Sensor Fuzed Weapon (SFW) and the CBU-105 WCMD/SFW.³¹

Potential Issues for Congress

Cluster Munitions in an Era of Precision Weapons

It may be argued that even with advances in “sensor-fuzed” type submunitions that seek out and destroy certain targets, cluster munitions are still essentially an indiscriminate area weapon in an era where precision weapons are increasingly becoming the military norm. In Operation Desert Storm in 1991, only about 10% of ordnance used were precision-guided, but by the time of the Iraq invasion in 2003, “the ratio of ‘smart’ to dumb weapons was nearly reversed.”³² Since then, this trend towards greater precision has continued, if not accelerated with the development of precision rocket, artillery, mortar munitions, and smaller precision aerial bombs designed to reduce collateral damage.³³ Given current and predicted future precision weaponry trends, cluster munitions might be losing their military relevance—much as chemical weapons did between World War I and World War II.

Weapons in Lieu of Cluster Munitions

According to the State Department, the U.S. military suspended its use of cluster munitions in Iraq and Afghanistan in 2003. For subsequent military operations, where cluster munitions would otherwise have been the weapon of choice, Congress might review what types of weapons were substituted in place of cluster munitions and how effective they were in achieving the desired tactical results. Also worth considering are effects-based weapons systems and operations, which seek to achieve the same or similar effect against a potential target without applying a “kinetic solution” such as a cluster munition. Such insights could prove valuable in analyzing U.S. policy options on the future of cluster munitions.

Is the CCW a Viable Forum for Regulating Cluster Munitions?

Given the failure of CCW delegates to reach an agreed protocol in November 2008 and the signature of CCM by prominent U.S. NATO allies Great Britain, France, and Germany, it has been suggested by some that it might be worth reevaluating the CCW as a means to regulate cluster munitions. There are doubts that CCW efforts to develop a cluster munitions protocol will be viable, as some nations that are part of the CCW who have also signed the Convention on Cluster Munitions stand in opposition of a CCW protocol on cluster munitions. If the United States were to become an active participant in the CCM, along with allies such as Great Britain, France, and Germany, it might have a greater role in shaping the future of this convention. One potential drawback, should the United States support the CCM, is that it could be seen as

³¹ Marina Malenic, “Dozens of Nations Sign Cluster Bomb Treaty, U.S. Begins Upgrading Related Technology,” *Defense Daily*, December 5, 2008.

³² J.R. Wilson, “Pinpoint Accuracy: Bombs, Rockets, and Mortars Get New Brains,” *Armed Forces Journal*, January 2005, pp. 32-34.

³³ Jeffrey Kofman, “Introducing the Small Diameter Bomb,” ABC News, February 16, 2008.

undermining the entire CCW, which encompasses more than just cluster munitions. Such a policy shift to support the CCM could also have a detrimental impact on any future CCW initiatives dealing with other conventional weapons.

Legislation in the 111th Congress

Consolidated Appropriations Act, 2010

The Consolidated Appropriations Act, 2010 (P.L. 111-117), which the President signed into law December 16, 2009, prohibits the provision of military assistance for cluster munitions, the issuing of defense export licenses for cluster munitions, or the sale or transfer of cluster munitions or cluster munitions technology unless “the submunitions of the cluster munitions, after arming, do not result in more than 1 percent unexploded ordnance across the range of intended operational environments.” Moreover, any agreement “applicable to the assistance, transfer, or sale of such cluster munitions or cluster munitions technology” must specify that the munitions “will only be used against clearly defined military targets and will not be used where civilians are known to be present or in areas normally inhabited by civilians.”

These restrictions were also contained in the 2009 Omnibus Appropriations Act (P.L. 111-8). The Consolidated Appropriations Act, 2008 (P.L. 110-161) contained similar restrictions, but they applied only for that fiscal year.

Legislation in the 112th Congress

H.R. 996, the Cluster Munitions Civilian Protection Act of 2011, was introduced in the House on March 10, 2011, and referred to the House Armed Services Committee the same day. An identical bill (S. 558) was introduced in the Senate on March 10, 2011, and referred to the Senate Foreign Relations Committee the same day. Both bills would prohibit “funds appropriated or otherwise available to any Federal department or agency” from being obligated or expended for the use of cluster munitions unless two conditions were met. First, the submunitions could not result in “more than 1 percent unexploded ordnance across the range of intended operational environments.” Second, the policy regarding the use of cluster munitions would need to specify that the munitions would “only be used against clearly defined military targets” and not be used “where civilians are known to be present or in areas normally inhabited by civilians.”

Both bills would allow the President to waive the first requirement by certifying to Congress that the use of cluster munitions “is vital to protect the security of the United States” and by submitting a report describing the steps that would be taken to protect civilians as well as “the failure rate of the cluster munitions” to be used and “whether such munitions are fitted with self-destruct or self-deactivation devices.” The bills would require the President to submit the certification and report “prior to the use of cluster munitions.” They also would require the President, in the event of any U.S. use of cluster munitions, to submit a plan to Congress for cleaning up any munitions or submunitions “which fail to explode and continue to pose a hazard to civilians.”

The Consolidated Appropriations Act, 2012 (P.L. 112-74), which the President signed into law December 23, 2011, contained provisions similar to those of P.L. 111-117.

Author Contact Information

Andrew Feickert
Specialist in Military Ground Forces
afeickert@crs.loc.gov, 7-7673

Paul K. Kerr
Analyst in Nonproliferation
pkerr@crs.loc.gov, 7-8693