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**Human Rights Watch Briefing Paper**

**Cluster Munitions a Foreseeable Hazard in Iraq**

Four U.S. Cluster Munitions of Concern.....2  
The Proliferation of Cluster Munitions of Concern .....4  
The Cluster Munition Problem from the 1991 Persian Gulf War .....5  
Impact on U.S. Military Forces .....6  
A Better Future? .....7  
Conclusion.....7

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## **Cluster Munitions a Foreseeable Hazard in Iraq**

The use of cluster munitions in Iraq will result in grave dangers to civilians and friendly combatants. Based on experiences in the Persian Gulf War in 1991, Yugoslavia/Kosovo in 1999, and Afghanistan in 2001 and 2002, these dangers are both foreseeable and preventable.

Cluster munitions cannot be targeted with precision. They cause damage over a very large and imprecise area, and, due to the numbers used and high failure rate, leave behind a great many unexploded “dud” submunitions that become de facto antipersonnel landmines. Human Rights Watch has called for a global moratorium on use of cluster munitions until these humanitarian problems are addressed. Environmental factors in parts of Iraq such as sand, wind, and marshes would likely contribute to producing even higher dud rates for submunitions.

This briefing paper identifies four types of U.S. cluster munitions in particular that have produced large numbers of hazardous duds during previous combat operations and during testing. These four cluster munitions are currently in the inventory of the United States, United Kingdom, and other nations. This paper also provides details about the use of cluster munitions in the 1991 Persian Gulf War, including the threat to U.S. forces from their own weapons, and the ongoing impact of the resulting explosive dud submunitions. Human Rights Watch has recently obtained startling information showing that eleven years after the end of the war, about 200 hazardous cluster munition duds are still found and destroyed each month in Kuwait.

### **Four U.S. Cluster Munitions of Concern**

Four types of U.S. cluster munitions have a history of producing high numbers of hazardous submunition duds. High dud rates have been documented in testing for Multiple Launch Rocket System (MLRS) M77 submunitions and 155mm artillery projectiles with M42 and M46 Dual Purpose Improved Conventional Munition (DPICM) submunitions. Two types of air-dropped cluster munitions--older Rockeye (CBU99/CBU-100) bombs and newer Combined Effects Munitions (CBU-87)--have produced high numbers of hazardous duds in combat operations in Iraq, Kuwait, Yugoslavia, and Afghanistan.

The United States stockpiles over one billion submunitions in weapons currently in service. Nearly three-quarters of this stockpile of submunitions are contained in MLRS rockets and 155mm artillery projectiles. Given reported failure rates, a stockpile of that size creates the specter of well over 100 million explosive duds, each posing a danger to civilians similar to antipersonnel landmines.

The four cluster munitions of concern and their reported failure rates include:

- **MLRS with M26 warhead:** 16 percent dud rate for the M77 submunition.<sup>1</sup> Some lots were reported to have dud rates as high as 23 percent, based on testing done to accept newly produced batches.<sup>2</sup> Each M26 warhead contains 644 submunitions. Thus, the standard volley of twelve MLRS rockets would likely result in more than 1,200 dud submunitions scattered randomly in a 120,000 to 240,000 square meter impact area. The U.S. stockpile of MLRS rockets contains over 309 million submunitions.<sup>3</sup> This could equate to more than 49.4 million explosive duds.
- **155mm DPICM M483A1 & M864 artillery projectiles:** 14 percent dud rate for the M42 and M46 DPICM submunitions.<sup>4</sup> The M483A1 artillery projectile contains sixty-four M42 and twenty-four M46 DPICM submunitions. The M864 projectile contains forty-eight M42 and twenty-four M46 DPICM submunitions. Based on the dud rate established by testing existing stocks of these projectiles, each M483A1 round fired would result in twelve dud submunitions and each M864 round would result in ten dud submunitions. The U.S. stockpile of 155mm projectiles contains over 434 million submunitions.<sup>5</sup> This could equate to more than 60.7 million hazardous duds.
- **Rockeye CBU-99/CBU-100:** Each Rockeye bomb contains 247 Mk 118 submunitions. These cluster bombs were used extensively in the 1991 Persian Gulf War. While no reliable estimate of the failure rate is available, clearance agencies in Kuwait encountered a very large number of dud Rockeye submunitions in their operations.<sup>6</sup> One U.S. company reported clearing 95,799 M118 Rockeye submunitions in their sector of Kuwait, which constituted 18% of the total area cleared.<sup>7</sup> In 2002, 451 Rockeye submunitions were detected and destroyed by mine clearance and explosive ordnance disposal teams in Kuwait.<sup>8</sup> Rockeyes, which were developed in the 1950s, were also used in great numbers in the Vietnam War. The number of Rockeye bombs currently in the U.S. arsenal is unknown, but is still believed to be high.

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<sup>1</sup> Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, “Unexploded Ordnance Report,” table 2-3, p. 5. No date, but transmitted to the U.S. Congress on February 29, 2000.

<sup>2</sup> U.S. General Accounting Office, “GAO/NSIAD-92-212: OPERATION DESERT STORM: Casualties Caused by Improper Handling of Unexploded U.S. Submunitions,” August 1993, pp. 5-6.

<sup>3</sup> U.S. Army Material Systems Analysis Activity, “Unexploded Ordnance (UXO) Study,” April 1996, p. 7.

<sup>4</sup> U.S. Army Defense Ammunition Center, Technical Center for Explosives Safety, “Study of Ammunition Dud and Low Order Detonation Rates,” July 2000, p. 9.

<sup>5</sup> U.S. Army Material Systems Analysis Activity, “Unexploded Ordnance (UXO) Study,” April 1996, p. 7.

<sup>6</sup> Colin King, “Explosive Remnants of War: A Study on Submunitions and other Unexploded Ordnance,” commissioned by the International Committee of the Red Cross, August 2000, p. 16 and p. E-2; U.S. General Accounting Office, “GAO-02-1003: MILITARY OPERATIONS: Information on U.S. Use of Land Mines in the Persian Gulf War,” September 2002, p. 27. The Department of Defense UXO report to Congress in 2000 cites a 98 percent submunition reliability rate for the Rockeye submunition—a claim not supported by the Kuwait evidence.

<sup>7</sup> U.S. Army Armament, Munitions, and Chemical Command, “Contract DAAA21-92-M-0300 Report by CMS, Inc.,” Undated; data cited by GAO 1993, GAO 2002, King 2000, and U.S. Army Material Systems Analysis Activity, 1996.

<sup>8</sup> Compiled from December 2001 to December 2002 editions of Kuwait Ministry of Defense, “Monthly Ammunition and Explosive Destroyed/Recovery Report,” Annex A.

- Combined Effects Munition CBU-87:** dud rates of at least 5 to 7 percent for the BLU-97 submunition in operations in Yugoslavia/Kosovo and Afghanistan.<sup>9</sup> The CBU-87 is an air-dropped bomb that contains 202 BLU-97 submunitions. Using the 7 percent submunition failure rate documented in Kosovo, each bomb dropped would result in fourteen explosive dud submunitions over an area about the size of a U.S. football field. The U.S. used a total of 10,035 CBU-87s, with more than 2 million submunitions, during the 1991 Persian Gulf War. The size of the U.S. stockpile of this older version of the Combined Effects Munition (CBU-87), which was first produced in 1984, is not known. But large numbers are believed to be held, even though newer models (CBU-103) are being fielded with improved accuracy, due to the Wind Corrected Munitions Dispenser, and fuze modifications.

In addition to these four cluster munitions, there are others with high failure rates that could be used in Iraq. While many of the older Vietnam-era cluster munitions that were used in large numbers in 1991 in Kuwait and Iraq are no longer serviceable and are prohibited from use, the U.S. military is retaining some older cluster munitions to make up for shortfalls in the inventories of newer, more reliable cluster munitions. For example, one older type of 105mm artillery projectile (designated M444) with a submunition dud rate of 12 percent is being retained to cover for stockpile shortages of another projectile (designated M915) with a 1 percent dud rate and a self-destruct fuze.

### **The Proliferation of Cluster Munitions of Concern**

The U.S. Department of Defense has also disposed of some of its aging cluster munitions by sales to foreign militaries.<sup>10</sup> The four cluster munitions identified above are already found in the inventory of many other countries, as detailed in the table below:

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<sup>9</sup> In Kosovo, on the basis of the clearance rate by March 2001 of unexploded submunitions, the United Nations Mine Action Coordination Center estimated that 7 percent of the BLU-97 submunitions failed to explode on impact. See International Campaign to Ban Landmines (ICBL), *Landmine Monitor Report 2001*, (New York: Human Rights Watch, 1999), p. 952. For Afghanistan, data provided on coalition air strikes to the United Nations mine action program by the U.S. Department of Defense used a 5 percent figure. See Human Rights Watch, “Fatally Flawed: Cluster Bombs and Their Use by the United States in Afghanistan,” *A Human Rights Watch Report*, vol. 14, no. 17, December 2002, p. 37. The Department of Defense UXO report to Congress in 2000 cites a 98 percent submunition reliability rate for the BLU-97 submunition.

<sup>10</sup> Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, “Unexploded Ordnance Report,” p. 3. No date but transmitted to the U.S. Congress on February 29, 2000.

Cluster Munition Type	Countries that Stockpile
MLRS with M26 warhead	Bahrain, Denmark, France, Germany, Greece, Israel, Italy, Japan, Netherlands, Norway, Turkey, United Kingdom, United States
155mm DPICM projectiles (M483A1 & M864)	Canada, Jordan, Netherlands, Pakistan, South Korea, Turkey, United States
Combined Effects Munition (CBU-87)	Egypt, France, Germany, Italy, Japan, Netherlands, Norway, Poland, Saudi Arabia, South Korea, United Arab Emirates, United Kingdom, United States
Rockeye	Canada, Denmark, Egypt, France, Israel, Norway, Oman, Turkey

### The Cluster Munition Problem from the 1991 Persian Gulf War

Human Rights Watch has reported previously on the use of cluster bombs during the 1991 Persian Gulf War.<sup>11</sup> Aerial-delivered cluster munitions accounted for about one-quarter of the bombs dropped on Iraq and Kuwait. Between January 17 and February 28, 1991, the United States and its allied coalition used a total of 61,000 air-dropped cluster munitions, releasing twenty million submunitions. About fifteen percent of those were CBU-87s, then new to the U.S. arsenal. Other, less reliable Vietnam-era cluster munitions were used in surprising large numbers, including CBU-52, CBU-58, CBU-71, and early versions of the Rockeye.<sup>12</sup> The number of cluster munitions delivered by surface-launched artillery and rocket systems during the Gulf War is not known, but one source estimates that over thirty million DPICM submunitions were used in the conflict.<sup>13</sup>

From the end of the conflict in 1991 through December 2002, 108 metric tons of cluster munitions were discovered and destroyed by mine clearance and explosive ordnance disposal teams in Kuwait.<sup>14</sup> In the year 2002, more than a decade after the fighting stopped, 2,400 explosive dud cluster munitions were detected and destroyed. These included: M42/M46/M77 (DPICM), Mk-118 (Rockeye), BLU-61A/B, BLU-77B, BLU-91B (Gator antivehicle mine), BLU-92B (Gator antipersonnel mine), BLU-97 (CBU-87), and Belouga (a French air-dropped cluster munition). Almost one in five of the dud cluster munitions found in 2002 were from Rockeye air-dropped bombs.<sup>15</sup>

This average of nearly seven per day is all the more stunning in that one of the most extensive and expensive clearance operations in history was carried out immediately after the

<sup>11</sup> Most recently, see Human Rights Watch, "Fatally Flawed: Cluster Bombs and Their Use by the United States in Afghanistan," *A Human Rights Watch Report*, vol. 14, no. 17, December 2002, pp. 40-41.

<sup>12</sup> Ibid.

<sup>13</sup> Colin King, "Explosive Remnants of War: A Study on Submunitions and other Unexploded Ordnance," commissioned by the International Committee of the Red Cross, August 2000, p. 16, citing Donald Kennedy and William Kincheloe, "Steel Rain: Submunitions," *U.S. Army Journal*, January 1993.

<sup>14</sup> Kuwait Ministry of Defense, Headquarters Land Forces Command, "Monthly Ammunition and Explosive Destroyed/Recovery Report," Annex A, December 21, 2002.

<sup>15</sup> Ibid. According to the same document, a similar number of cluster munitions were cleared in 2001.

war.<sup>16</sup> Hazardous dud cluster munitions continue to be uncovered in Kuwait. In February 2003, soldiers with the U.S. 3<sup>rd</sup> Infantry Division discovered a dud BLU-63 cluster munition on one of their urban combat training ranges in the Kuwaiti desert.<sup>17</sup>

While less information is available on the problem in Iraq, Iraq is still severely affected by landmines, cluster munition duds, and other types of unexploded ordnance (UXO) from the 1991 Gulf War, as well as the 1980-1988 Iraq-Iran War, two decades of internal conflict, and World War Two. Landmines and UXO pose a problem in the north, along the Iran-Iraq border, and throughout the central and southern regions of the country.<sup>18</sup> The International Committee of the Red Cross in 2001 identified unexploded cluster bombs and other UXO as the main threat to communities living in southern Iraq.<sup>19</sup>

### Impact on U.S. Military Forces

During combat in the 1991 Persian Gulf War, U.S. forces experienced the danger of casualties caused by their own weapons as well as impediments to mobility when operating in areas contaminated by hazardous duds produced by U.S. cluster munitions.<sup>20</sup> Numerous references to this are found in official U.S. military documents. One report states, “Battlefield experience has demonstrated that weapon systems containing submunitions present the greatest potential for creating UXO, since a significant percentage of these submunitions may not detonate reliably.”<sup>21</sup> The U.S. Armed Services recorded 177 “explosion casualties” in the conflict, constituting 13 percent of the total U.S. military casualties.<sup>22</sup> At least eighty of the U.S. casualties were attributed to cluster munition duds.

#### U.S. Military “Explosion Casualties” During 1991 Gulf War

Type of Munition	Number of Casualties
Cluster Munition UXO-CBU	64
Unidentified Landmine	46
Iraqi Landmines	35
Cluster Munition UXO-DPICM	16
Other UXO	16

<sup>16</sup> See, for example, ICBL, *Landmine Monitor Report 1999*, p. 891.

<sup>17</sup> Juan Tamayo, “10 Million Land Mines Lie in Wait Inside Iraq, Troops also face ’91 War Leftovers,” *Miami Herald*, February 20, 2003.

<sup>18</sup> Human Rights Watch, “Landmines in Iraq, Questions and Answers,” December 2002; for further details on Iraq see ICBL, *Landmine Monitor Report 2002*, September 2002, pp. 671-673.

<sup>19</sup> Laurence Desvignes, “Red Cross/Red Crescent Mine Action Involvement in the Middle East,” *Journal of Mine Action*, Issue 5.3, Fall 2001, p. 13.

<sup>20</sup> U.S. General Accounting Office, “GAO-02-1003: MILITARY OPERATIONS: Information on U.S. Use of Land Mines in the Persian Gulf War,” September 2002, pp. 29-33; U.S. General Accounting Office, “GAO/NSIAD-92-212: OPERATION DESERT STORM: Casualties Caused by Improper Handling of Unexploded U.S. Submunitions,” August 1993, p. 9.

<sup>21</sup> Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, “Unexploded Ordnance Report,” p. 2. No date but transmitted to the U.S. Congress on February 29, 2000.

<sup>22</sup> U.S. General Accounting Office, “GAO-02-1003,” p. 15, p. 17, figure 2. All casualty figures provided to GAO by U.S. Armed Services and are treated separately from casualties resulting from direct enemy action.

## A Better Future?

The United States military has recognized that the high failure rate of its existing stockpile of cluster munitions poses unacceptable risks to both U.S. forces and civilian populations. Efforts are underway to improve the reliability of newly produced cluster munitions. As a result of a new policy decision in 2001, weapons with submunitions produced after 2005 are required to be 99 percent reliable.<sup>23</sup> A contract was awarded in February 2003 to manufacture 500,000 self-destruct fuzes for M915 105mm DPICM artillery projectiles.<sup>24</sup> Funds to remanufacture and retrofit 24,345 M864 155mm DPICM projectiles with self-destruct fuzes were requested in the fiscal year 2004-2005 ammunition procurement budget request.<sup>25</sup> Plans to produce a new generation of MLRS rockets with self-destruct fuzes for submunitions are also being developed.<sup>26</sup>

However, the 2001 policy permits continued use of existing cluster munitions that do not meet the new standard: “The services may retain ‘legacy’ submunitions until employed or superceded by replacement systems....” The U.S. stockpiles more than one billion of these “legacy” submunitions with a failure rate of more than 1 percent. There is a fundamental inconsistency in acknowledging the dangers of these submunitions and the need to replace them, while still permitting their use.

## Conclusion

As noted above, Human Rights Watch has called for a global moratorium on use of cluster munitions until the humanitarian problems are addressed. Short of that commitment, Human Rights Watch urges that the United States, United Kingdom, and others that may deploy cluster munitions in Iraq take the following steps:

- Prohibit the use of any cluster munitions in attacks on or near populated areas;
- Suspend use of and withdraw cluster munitions that have been tested and identified as producing high dud rates;
- Refrain from using or transferring out-of-date types of cluster munitions in an effort to “clean the closet” of stockpiles;
- Record, report, track, and mark known or suspected cluster munition strike areas; and,
- Preserve this information so it can be disseminated quickly in clearance efforts.

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<sup>23</sup> Secretary of Defense William Cohen, “Memorandum for the Secretaries of the Military Departments, Subject: Department of Defense Policy on Submunition Reliability (U),” January 10, 2001. It states, “It is the policy of the DoD [Department of Defense] to reduce overall UXO through a process of improvement in submunition system reliability – the desire is to field future submunitions with a 99% or higher functioning rate.... The Services shall evaluate ‘legacy’ submunition weapons undergoing reprocurement, product improvement, or block upgrades to determine whether modifications should be made to bring them into compliance with the above policy.”

<sup>24</sup> U.S. Army Armaments Research and Development Engineering Center, Contract Award Notice DAAE30-03-R-0800, “M234 Self-Destruct Fuze Low Rate Initial Production-Sole Source,” February 6, 2003.

<sup>25</sup> U.S. Department of the Army, “Committee Staff Procurement Backup Book, FY2004/FY2005 Biennial Budget Submission, Procure of Ammunition, Army,” February 2003, p. 323.

<sup>26</sup> Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, “Unexploded Ordnance Report” no date but transmitted to the U.S. Congress on February 29, 2000, p. A-3.