

《禁止或限制使用某些可被认为具有过分
伤害力或滥杀滥伤作用的常规武器公约》
缔约国政府专家小组

CCW/GGE/II/WP.21
25 July 2002

CHINESE
Original: ENGLISH

第二届会议

2002年7月15日至26日，日内瓦

与反车辆地雷有关的技术措施资料：
可探测性与自毁/自失效/自失能

美利坚合众国编写的文件

关键术语

(下列解释丝毫不改变现有的定义。提供这些解释的目的仅仅在于帮助理解讨论中所用的关键术语。)

可探测地雷：可探测地雷能用现有普通地雷探测技术设备探测并可产生相当于8克或8克以上的一整块铁块所产生信号的响应信号。

自毁(SD)：安装自毁装置以后，地雷会在预定的时间自动爆炸。

自失效(SN)：安装自失效装置以后，引信或地雷的另一部件会在可调的预定时间失效。

自失能(SDA)：安装自失能装置以后，地雷由于一个基本的部件例如电池被耗竭而不再能起作用。

概 念

从技术上说，为什么不可探测的地雷构成了问题？——不可探测的地雷妨碍了排雷工作。地雷如果不含有适当的金属物，则很难探测出来，即使在已经标出并且受到监视的雷场里，也是如此。拟议的8克重量标准会明显地改善在各种土壤条件下探测出地雷的机会，即使是未受到最佳培训、设备也不是一流的扫雷人员也能做到。

自毁——装有自毁装置的地雷拥有某种内装或外附机制，这种机制在预定的时间自动将地雷销毁。自毁型地雷依然给指挥员以更大程度的灵活性以对付敌人。通过使用这种地雷对付纵深的目标，指挥员可确定在什么样的条件下进行战斗。在近距离战斗中，这使指挥员拥有更大的行动自由。另外，这减少了军人和平民将要遭遇的危险物品的数量。而且，从人道主义的角度看，自毁型地雷仅仅是一个短期问题，而未安装自毁或自失效和自失能装置的地雷将是一个长期存在的威胁。

自失效——自失效是自毁的替代性办法或者是对自毁提出的额外要求。原则上，自失效是指地雷关闭引爆装置或变得不能再用。当预定的或可调的引信时限来临时，便会发生自失效。使用自失效装置，可使友军部队挖出人工埋设的地雷，在更换地增加引信后，地雷便能再次使用(重复使用)。在这一过程中，地雷不会对友军人员构成威胁。重要的一点是，由于只能用工业化生产的“新”引信才能完成这一过程，因此敌人(或平民)不可能轻易地更换引信，使地雷恢复使用。然而，要把布设在 30 公里以外的遥布地雷收集起来是不可能的。因此，之所以要把自失效列为自毁的替代性办法，这不单单是为了重新使用遥布的地雷。自失效提供了一种选择，它降低了可引爆的地雷可能造成的任何威胁，尽管已经“自失效”的地雷可能还须在这一过程中作为危险物品得到清除和处理。

自失能——自失能特征基本上是一种备用的、保险的特征。用议定书中的语言来说，自失能是指因一个使弹药起作用的关键部件例如电池不可逆转地耗竭而自动使弹药无法起作用。也就是说，如果自毁装置失灵，自失能装置便确保地雷不能作为地雷起作用。众所周知，电池会随着时间放电，而且不可逆转。如果电池对地雷的引爆不可缺少，那么当电池失灵时(不是“如果”的问题)，地雷就不会起作用。从根本上说，因为其内部电池耗竭，地雷就不再起作用。

成本

可探测性：对美国来说，8 克金属的材料成本约是 8 美分。

自毁/自失效以及自失能装置：据估计，符合《特定常规武器公约》规格的自毁/自失能或者自失效/自失能装置可融入新地雷的设计中，其附加的成本不到 20

美元。这一成本远远低于埋设地雷后清除地雷的成本。反车辆地雷所用的可靠的自毁/自失效装置的技术与杀伤人员地雷所需的技术完全相同。

在关于可探测性和自毁/自失效和自失效技术措施的提案中未处理的问题

杀伤人员地雷——杀伤人员地雷没有被涉及。

储存——储存问题没有被涉及。目前关于可探测性和自毁/自失效和自失效问题的建议可以被通过，而无须改变、更动或销毁现有储存。

已经埋入地面中的反车辆地雷——如果一国已经在地面埋设了不可探测的地雷，目前的建议并不要求排除这些地雷。

手工埋设的反车辆地雷——目前的建议只要求遥布的地雷加上自毁/自失效和自失效装置。因此，它们不要求在手工埋设的可能长期用在边界雷场的地雷配上自毁/自失效和自失效装置。

可靠性要求——目前的建议并没有在 1996 年经修正后的地雷议定书已有的要求基础上提高可靠性标准。


保存期

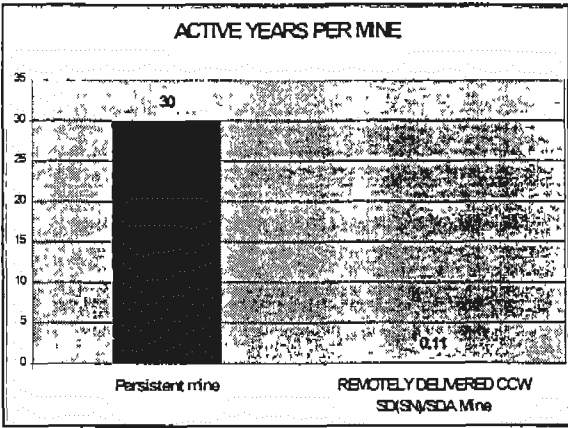
许多地雷和弹药通常有大约 30 年的保存期(储存寿命)。因此，许多在 1970 年代布设的遥布地雷系统可能正接近其保存期限。

附件

[ENGLISH ONLY]

<p style="text-align: center;">LIMITING LANDMINE PERSISTENCE</p>	<p style="text-align: center;">WHY LIMIT LANDMINE PERSISTENCE ?</p> <ul style="list-style-type: none"> • Humanitarian - reduce loss of <ul style="list-style-type: none"> - Lives - Limbs - Land <p><u>Budgetary-</u> mine removal much more expensive than mine production</p> <p>Military</p> <ul style="list-style-type: none"> - Minimize risk to friendly troops - Maintain freedom of movement
<p style="text-align: center;">AVL HUMANITARIAN WEEKEND ACTIVITIES</p> <p>"A land mine killed 13 bus passengers and six others were injured in the central Afghan province of Bamiyan...Saturday morning....The bus driver had been told by villagers to take a detour because of the risk of landmines <i>planted during years of fighting....</i> Mines...in some areas... are preventing refugees from returning home and cultivating the land".</p> <p style="text-align: right;"><u>Reuters, July 21, 2002</u></p>	<p style="text-align: center;">MILITARY ISSUE : AREN'T PERSISTENT REMOTELY-DELIVERED AVL NECESSARY ?</p> <p><u>Remotely-delivered mines</u> needed for <u>rapid emplacement</u> on a <u>fluid battlefield</u></p> <p>Where <u>hostile forces</u> are at the time <u>mines are emplaced, friendly forces</u> may need to go within <u>hours or days</u></p> <p>Remotely-delivered mines need to <u>remove themselves</u> to permit movement <u>of friendly forces</u></p>
<p style="text-align: center;">HOW LIMIT LANDMINE PERSISTENCE ?</p> <ul style="list-style-type: none"> • <u>SD: Self Destruct (alarm clock)</u> <ul style="list-style-type: none"> - Mine self-removes - Precise timing • <u>SN: Self Neutralize (microwave oven)</u> <ul style="list-style-type: none"> - No explosion - Precise timing • <u>SDA: Self Deactivate (flashlight)</u> <ul style="list-style-type: none"> - Very reliable even with weak quality control 	<p style="text-align: center;">CCW RELIABILITY AND DURATION</p> <ul style="list-style-type: none"> • SD (or SN): 90% (no more than one in ten remaining) at 30 days after emplacement • SDA combined with SD (or SN) 99.9% (<u>no</u> more than one in a thousand remaining functional) at 120 days after replacement • <u>Required</u> of remotely-delivered mines

<p style="text-align: center;">US SD Reliability</p> <p>√ 35,093 SD APL and 31,165 SD AVL have been tested at proving ground under full range of conditions</p> <p>√ Live mines left after 15 days –</p>	<p style="text-align: center;">US SD Reliability</p> <p>√ 35,093 SD APL and 31,165 SD AVL have been tested at proving ground under full range of conditions</p> <p>√ Live mines left after 15 days –</p> <p><u>ZERO</u></p> 
<p style="text-align: center;">COMBAT EXPERIENCE</p> <ul style="list-style-type: none"> • In Gulf war, US used 165,030 SD/SDA mines • 1% were later found on the field and destroyed by mine clearance teams <ul style="list-style-type: none"> - Zero mines functioned after SD time - Zero mines self-destructed late - Zero known civilian or friendly casualties • Mines broke, never activated. <ul style="list-style-type: none"> - Non-activated mines are harmless - SD failure possible but very unlikely - If there were an SD failure, SDA would have rendered mines harmless - Even assuming improbable worst case, mines exceeded all CCW requirement 10X 	<p style="text-align: center;">SD vs. SN</p> <ul style="list-style-type: none"> • <u>SD advantages:</u> <ul style="list-style-type: none"> - Unambiguously removes the mine - De-miner's job is reduced to verifying absence of mines • <u>SN advantages:</u> <ul style="list-style-type: none"> - No explosion • Bottom line: For <u>APL</u>, SD far superior. For <u>AVL</u>, could go either way.
<p style="text-align: center;">WHY NOT SD OR SN ALONE ?</p> <ul style="list-style-type: none"> • 90% required reliability leaves one mine in ten active. • Even with 99.9999% reliable SD or SN, possibility of catastrophic failure remains. • SD and SN are active mechanisms. If they fail, the mine remains lethal. • SDA always works. SDA component failure leaves mine SAFE. <u>ULTIMATE RELIABILITY.</u> 	<p style="text-align: center;">WHY NOT SDA ALONE ?</p> <ul style="list-style-type: none"> • Longer active life (120 days vs. 30) • Leaves mine in the field (disadvantage relative to SD) • Military disadvantage: No precisely predictable near-term safe point.

<p style="text-align: center;">THE AVL SOLUTION</p> <p style="text-align: center;">SD (or SN)</p> <p style="text-align: center;">+</p> <p style="text-align: center;">SDA</p>	<p style="text-align: center;">PROPOSAL</p> <ul style="list-style-type: none"> • NO requirement to clear mines in the ground • NO restrictions on stockpile; use regime only • NO SD, SN, or SDA required for directly emplaced mines • NO increase in reliability requirement over AMP • NO impact on APL 						
<p style="text-align: center;">SD(SN) TECHNOLOGY IS NOT DIFFICULT OR ADVANCED</p> <ul style="list-style-type: none"> • U.S. 99.9999% reliable SD began production in 1978 • More advanced technology is available to any country on the commercial market • More advanced technology now being produced in many developing countries • 90% SD requirement for remotely-delivered APL already in force - <u>technology is the same</u> 	<p style="text-align: center;">SD(SN)/SDA IS AFFORDABLE</p> <ul style="list-style-type: none"> • CCW requires only 90% reliability • SD/SDA or SN/SDA meeting CCW specifications can be incorporated into a new mine design at an incremental cost of <\$20 • Trivial compared to <ul style="list-style-type: none"> - Mine life-cycle cost - Mine clearance cost 						
<p style="text-align: center;">HUMANITARIAN BENEFIT</p>	<p style="text-align: center;">How to measure landmine civilian risk ?</p> <ul style="list-style-type: none"> • Raw numbers of mines used is a poor measure • Hazard is directly proportional to duration of active mine life • MINE-YEAR is the relevant measure CCW SD(SN)/SDA reduces persistence & humanitarian risk 99.6% 						
 <p style="text-align: center;">ACTIVE YEARS PER MINE</p> <table border="1"> <thead> <tr> <th>Mine Type</th> <th>Active Years per Mine</th> </tr> </thead> <tbody> <tr> <td>Persistent mine</td> <td>30</td> </tr> <tr> <td>REMOVELY DELIVERED CCW SD(SN)/SDA Mine</td> <td>0.11</td> </tr> </tbody> </table>	Mine Type	Active Years per Mine	Persistent mine	30	REMOVELY DELIVERED CCW SD(SN)/SDA Mine	0.11	
Mine Type	Active Years per Mine						
Persistent mine	30						
REMOVELY DELIVERED CCW SD(SN)/SDA Mine	0.11						