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Chapter 1 : Explosively formed penetrator - Wikipedia

Improvised Explosive Devices (IEDs) / Booby Traps IED Overview. An IED can be almost anything with any type of material and initiator. It is a "homemade" device that is designed to cause death or.

See Article History Alternative Title: IED Improvised explosive device IED , a homemade bomb , constructed from military or nonmilitary components, that is frequently employed by guerrillas , insurgents, and other nonstate actors as a crude but effective weapon against a conventional military force. When used as roadside bombs, IEDs can interdict lines of communication, disrupt traffic, and damage or destroy targeted vehicles. Sometimes entryways or entire structures are booby-trapped with IEDs to kill or injure anyone such as a squad of soldiers entering the premises. Larger vehicle-borne IEDs car or truck bombs have been used to destroy entire installations, such as the barracks of U. IEDs have been the predominant weapon of insurgents in the Iraq War and the Afghanistan War , and, because of their low cost, ease of employment, and high effectiveness, they will continue to be the weapon of choice for guerrillas and insurgents for the foreseeable future. Components In principle, all IEDs consist of an initiating mechanism , a detonator, an explosive charge, and a casing or collection of projectiles such as ball bearings or nails that produces lethal fragments upon detonation. In practice, IEDs can be made of many different kinds of objects and materials, including artillery or mortar rounds, aerial bombs, certain types of fertilizers, TNT , and other explosives. IEDs can also contain radiological, chemical , or biological components to increase their lethal and psychological effects. IEDs aimed at killing or injuring personnel can be as crude as pipe bombs a metal pipe packed with explosive material and sealed at both ends , though they are often more-complex. Vehicle-borne IEDs aimed at destroying buildings can contain large quantities of explosives to enhance their destructive capacity. IEDs aimed at destroying vehicles can be quite sophisticated, especially if the target is armoured. For example, some IEDs have shaped-charge warheads that upon detonation create streams of molten metal that can penetrate armour. Army Insurgents have used a wide variety of initiating systems to trigger detonations. Such systems fall into two basic categories: Command-initiated IEDs are detonated through human interaction with the triggering mechanism. Typically, a receiver on the explosive triggers detonation when an electronic impulse is sent over a wire circuit or via wireless signal. Common examples of command initiators are cell phones, pagers, cordless telephones, automatic garage-door openers, car alarms, wireless doorbells, and remote-controlled toys. Autonomously initiated IEDs are detonated automatically without human intervention. Army soldier displaying components typically found in an improvised explosive device, Army Tactical use IEDs have proved to be extremely effective in practice. They were responsible for thousands of military and civilian deaths in the wars in Iraq and Afghanistan, where insurgents proved particularly adept at hiding IEDs through skillful emplacement and effective camouflage. For instance, IEDs have been camouflaged to look like debris or street curbs; they have been emplaced behind guardrails, in animal carcasses, and inside culverts; and they have been dug into the ground and buried. To find and destroy concealed IEDs, the U. Army developed heavily armoured engineering equipment that can conduct reconnaissance and then remotely detonate any devices discovered. Engineer Ordnance Disposal EOD experts disable or destroy IEDs through a variety of means, including the use of robotic ground vehicles and explosives. Stryker armoured vehicle lying on its side after it received a blast from an improvised explosive device buried beneath a roadway, However, insurgents countered those improvements by producing more-powerful bombs. Technological innovations to counter IEDs therefore have also focused on interrupting the signals that detonate the devices. Various jamming devices, such as the U. Warlock system, were installed in vehicles to interrupt wireless triggering signals. Such systems are effective, but in response insurgents in many areas simply reverted to the use of hardwired initiation systems that do not rely on wireless signals. With the battlefield constantly shifting, countermeasures using a variety of technologies must be developed, though it is difficult to counter IEDs through technological means alone. Fully effective countermeasures must also target the social network that enables the existence of IEDs, such as the people who finance the devices, those who construct them, those who position them, and even those who act as lookoutsâ€”that is, all the people who conduct supporting

activities before the devices are actually detonated. Army bomb-detecting spinachLearn about scientifically enhanced spinach being developed to help in detecting explosives in war-torn countries.

Chapter 2 : Improvised explosive device | Military Wiki | FANDOM powered by Wikia

An improvised explosive device (IED) is a bomb constructed and deployed in ways other than in conventional military action. It may be constructed of conventional military explosives, such as an artillery shell, attached to a detonating mechanism.

The Evolving Tactics of a Terrorist Group The attempt to solve a problem by making policy in the midst of or in response to a crisis can create even greater difficulties. Perhaps one of the best historical examples of the pitfalls of narrowly focusing on immediate events, at least in the context of precursor chemicals, is that of the response of the United Kingdom to the explosives produced by PIRA during its bombing campaign. Responding narrowly to these events, both the United Kingdom and the United States increased controls on dynamite. In the United States, bombers migrated to readily accessible low-explosive fillers like black powder and smokeless powder which remain popular choices to this day. Such materials were not accessible in the United Kingdom, but PIRA was able to obtain farm chemicals to replace the dynamite. The first chemical PIRA used to produce HME mixtures and replace dynamite was sodium chlorate, a strong oxidizer used as a weed killer. Sodium chlorate was mixed with the energetic fuel nitrobenzene to make small explosive charges. To counter the threat of chlorate explosives, the United Kingdom government mandated the addition of a diluent to weed killer to reduce its explosive potential. Many farmers in Northern Ireland possessed large quantities of AN as it was a chief fertilizer found in agriculture. In addition, with the heavy equipment required for farming, many of the same farmsteads were equipped with diesel tanks and pumps. The net result was larger, fragment-producing bombs. These larger, heavier IEDs had to be delivered by vehicles due to their mass. The National Academies Press. CAN consisted of AN combined with dolomitic limestone a blend of calcium and magnesium carbonate. AN was soluble in water, and the dolomite diluent was not. By mixing the CAN in hot water the AN could be dissolved and separated from the insoluble carbonate component. Once the solid was filtered out, the remaining liquid could be driven off to isolate nearly pure AN. The use of CAN in farming did not stop PIRA, but it did make the production of AN-based devices more time consuming and removed the least-adept bomb makers from the picture. Thus, the countermeasure had some limited effect. It was coarse and crystalline and would not absorb an optimum amount of diesel. To compensate for this change PIRA began using alternative fuels. In , approximately 19 years after its introduction, PIRA discovered that crushing the CAN prills into a powdered form using either industrial strength coffee grinders or barley crushers eliminated the need to isolate purified AN. The pulverized CAN could be mixed with a variety of fuels to make an effective explosive filler. Two fuels surfaced as constants: Aluminum was applied consistently for smaller, mortar-borne charges, and sugar was used in the larger-scale VBIEDs. Three of these bombs were deployed against the city of London, and one the city of Manchester. The largest was approximately 4, pounds roughly equivalent to the bomb used in Oklahoma City. Initially, groups attempt to procure commercial or military explosives if such are accessible. In the absence of available explosives, they look for materials that can be blended Page 29 Share Cite Suggested Citation: Denied the precursors for simple blends, they resort to processing materials to produce the feedstock of their explosives, such as by isolating AN from CAN. With each level of difficulty introduced into the process, fewer bombers will be successful in their endeavors. However, any government creating controls for precursor chemicals must consider the tactics that will be developed in response. Charge Size Analysis Not all precursor chemicals can be used to make the main charges for every bombing scenario. Figure summarizes the various precursor chemicals seen as the main charges for different use-cases: These are not the only possible charges for each use-case. VBIEDs use charges ranging in mass from approximately 40 pounds to tens of thousands of pounds, depending on the carrying capacity of the vehicle. Precursor chemicals used to produce these explosives tend to be fertilizers e. PBIEDs are typically encountered in backpacks, brief cases, small bags, and suicide bombing vests, belts, etc. The charge mass of these devices is predicated on what the individual delivering the charge is capable of carrying. PBIEDs typically also employ a mass of fragmentation material, such as nails or screws, that can weigh as much as the explosive charge itself. Explosives used against aviation targets

historically have been military formulations due to their reliability and power, although recent terrorist plots against aircraft have used HMEs, albeit below the mass seen in PBIEDs. Terrorists use precursor chemicals frequently in detonator construction, but they also opt for pre-made systems acquired from commercial sources when possible. Detonators use precursor chemicals in very small amounts, but the primary explosives they produce are often very sensitive and unstable. Thus, there is an inherent danger in making, handling, transporting, and storing improvised detonators. Page 30 Share Cite Suggested Citation: Page 31 Share Cite Suggested Citation: Food products include flour and icing sugar. For a fuller list of food products, refer to Figure Fuels include diesel and saw dust. Thus, the risk of either scenario might rate concern when both severity and probability are included in the assessment. Starting with these scenarios, one can 1 identify the chemicals that terrorists can use to produce each type of device and the conditions under which they can obtain them; 2 develop strategies to reduce the odds of malicious actors getting access to the precursor chemicals; and 3 ultimately, lessen the risk of either scenario by making both scenarios less likely to happen i. While beyond the scope of this study, it may also be possible to drive toward scenarios with less lethal or damaging consequence i. Page 32 Share Cite Suggested Citation:

Chapter 3 : Improvised explosive device - Wikipedia

Improvised explosive device (IED), a homemade bomb, constructed from military or nonmilitary components, that is frequently employed by guerrillas, insurgents, and other nonstate actors as a crude but effective weapon against a conventional military force.

Edit A portable X-ray generator and a portable flat panel detector are used to inspect a suspicious carrying case. The term Improvised Explosive Device comes from the British Army in the s, after the Provisional Irish Republican Army IRA used bombs made from agricultural fertilizer and semtex smuggled from Libya to make highly effective boobytrap devices or remote-controlled bombs. An IED is a bomb fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic , or incendiary chemicals and designed to destroy or incapacitate personnel or vehicles. In some cases, IEDs are used to distract, disrupt, or delay an opposing force, facilitating another type of attack. An IED has five components: An IED designed for use against armoured targets such as personnel carriers or tanks will be designed for armour penetration, by using either a shaped charge or an explosively formed penetrator. IEDs are extremely diverse in design, and may contain many types of initiators, detonators, penetrators, and explosive loads. Antipersonnel IEDs typically also contain fragmentation-generating objects such as nails, ball bearings or even small rocks to cause wounds at greater distances than blast-pressure alone could. IEDs are triggered by various methods, including remote control, infra-red or magnetic triggers, pressure-sensitive bars or trip wires victim-operated. In some cases, multiple IEDs are wired together in a daisy-chain, to attack a convoy of vehicles spread out along a roadway. IEDs made by inexperienced designers or with substandard materials may fail to detonate , and in some cases actually detonate on either the maker or the emplacer of the device these unintended early detonations are known as pre-detonations, " own goals ," or "self-resolving bomb-tech removal" if the placer is killed in the detonation. Some groups, however, have been known to produce sophisticated devices that are constructed with components scavenged from conventional munitions and standard consumer electronics components, such as mobile phones, washing machine timers, pagers, or garage door openers. The sophistication of an IED depends on the training of the designer and the tools and materials available. IEDs may use artillery shells or conventional high-explosive charges as their explosive load as well as homemade explosives. However, the threat exists that toxic chemical , biological , or radioactive dirty bomb material may be added to a device, thereby creating other life-threatening effects beyond the shrapnel, concussive blasts and fire normally associated with bombs. Chlorine liquid has been added to IEDs in Iraq , producing clouds of chlorine gas. A vehicle borne IED, or VBIED, is a military term for a car bomb or truck bomb but can be any type of transportation such as a bicycle, motorcycle, donkey, etc. These are typically employed by insurgents , and can carry a relatively large payload. They can also be detonated from a remote location. VBIEDs can create additional shrapnel through the destruction of the vehicle itself, as well as using vehicle fuel as an incendiary weapon. Of increasing popularity among insurgent forces in Iraq is the HBIED or House Borne IED, coming out of the common military practice of clearing houses, insurgents will rig an entire house to detonate and collapse shortly after a clearing squad has entered. A hand grenade with the safety pin removed and safety lever compressed was placed into a container such as a tin can, with a length of string or tripwire attached to the grenade. The can was fixed in place and the string was stretched across a path or doorway opening and firmly tied down. In alternative fashion, the string could be attached to the moving portion of a door or gate. When the grenade was pulled out of the can by a person or vehicle placing tension on the string, the spring-loaded safety lever would release and the grenade would explode. The rubber band grenade was another booby trap. To make this device, a Viet Cong guerrilla would wrap a strong rubber band around the spring-loaded safety lever of a hand grenade and remove the pin. The grenade was then hidden in a hut. American and South Vietnamese soldiers would burn huts regularly to prevent them from being inhabited again, or to expose foxholes and tunnel entrances, which were frequently concealed within these structures. When a hut with the booby trap was torched, the rubber band on the grenade would melt, releasing the safety lever and blowing up the hut. This would often wound the soldiers with burning bamboo and metal fragments.

This booby trap was also used to destroy vehicles when the modified grenade was placed in the fuel tank. The rubber band would be eaten away by the chemical action of the fuel, releasing the safety lever and detonating the grenade. Another variant was the Mason jar grenade. The safety pin of hand grenades would be pulled and the grenades would be placed in glass Ball Mason jars, which would hold back the safety lever. The safety lever would release upon the shattering of the jar and the grenade would detonate. This particular variant was popular with helicopter warfare, and were used as improvised anti-personnel cluster bombs during air raids. They were easy to dump out of the flight door over a target, and the thick Ball Mason glass was resistant to premature shattering. They used barrack buster mortars and remote controlled IEDs. Members of the IRA developed and counter-developed devices and tactics. IRA bombs became highly sophisticated, featuring anti-handling devices such as a mercury tilt switch or microswitches. These devices would detonate the bomb if it was moved in any way. Typically, the safety-arming device used was a clockwork Memopark timer, which armed the bomb five minutes after it was placed by completing an electrical circuit supplying power to the anti-handling device. Depending on the particular design e. However, some electronic delays developed by IRA technicians could be set to accurately detonate a bomb weeks after it was hidden, which is what happened in the Brighton hotel bomb attack of Initially, bombs were detonated either by timer or by simple command wire. Later, bombs could be detonated by radio control. Initially, simple servos from radio-controlled aircraft were used to close the electrical circuit and supply power to the detonator. After the British developed jammers, IRA technicians introduced devices that required a sequence of pulsed radio codes to arm and detonate them. These were harder to jam. Roadside bombs were extensively used by the IRA. Typically, a roadside bomb was placed in a drain or culvert along a rural road and detonated by remote control when British security forces vehicles were passing. As a result of the use of these bombs, the British military stopped transport by road in areas such as South Armagh, and used helicopter transport instead to avoid the danger. Most IEDs used commercial or homemade explosives, although the use of Semtex -H smuggled in from Libya in the s was also common from the mids onward. The IRA also used secondary devices to catch British reinforcements sent in after an initial blast as occurred in the Warrenpoint Ambush. This mortality rate was far higher than other high risk occupations such as deep sea diving, and a careful review was made of how men were selected for EOD operations. The review recommended bringing in psychometric testing of soldiers to ensure those chosen had the correct mental preparation for high risk bomb disposal duties. The IRA engaged in an ongoing battle to gain the upper hand in electronic warfare with remote controlled devices. This approach by the British army to fighting the IRA in Northern Ireland led to the development and use of most of the modern weapons, equipment and techniques now used by EOD Operators throughout the rest of the world today. Starting six months before the invasion of Afghanistan by the USSR on 27 December , the Afghan Mujahideen were supplied with large quantities of military supplies. Among those supplies were many types of anti-tank mines. The insurgents often removed the explosives from several foreign anti-tank mines, and combined the explosives in tin cooking-oil cans for a more powerful blast. By combining the explosives from several mines and placing them in tin cans, the insurgents made them more powerful, but sometimes also easier to detect by Soviet sappers using mine detectors. After an IED was detonated, the insurgents often used direct-fire weapons such as machine guns and rocket-propelled grenades to continue the attack. Afghan insurgents operating far from the border with Pakistan did not have a ready supply of foreign anti-tank mines. They preferred to make IEDs from Soviet unexploded ordnance. The devices were rarely triggered by pressure fuses. They were almost always remotely detonated. According to a report by the Homeland Security Market Research in the USA, the number of IEDs used in Afghanistan had increased by percent since and the number of troops killed by them by percent, and those wounded by percent. Israel withdrew from most of Lebanon in but still kept troops stationed in a buffer zone in southern Lebanon. Chechnya Edit IEDs have also been popular in Chechnya, where Russian forces were engaged in fighting with rebel elements. While no concrete statistics are available on this matter, bombs have accounted for many Russian deaths in both the First Chechen War â€” and the Second â€”

Chapter 4 : Public Affairs - Counter IED Training

an IED can have many different appearances depending on the components that its made of. anything from a cell phone or a washing machine timer with wire leads could be used for ignition, so this.

To hear it from Command Sgt. Todd Burnett, nearly is not enough. The MCIT is a state-of-the-art, immersive training system that navigates trainees from familiarization and testing to performance-based simulations. It is housed in four modified conex containerseach featuring a unique training module using video storytelling and multimedia technology to get perspectives from both friendly and enemy forces. Burnett said lessons are reinforced in each section of the MCIT. In the final trailer, a squad can be split between operating a mockup MRAP and acting as the opposition force. No, Burnett said, there is testing involved and success is mandatory. The thick, pocket-sized reference guide contains comprehensive, illustrative information about IEDscovering topics from how and by whom they are made and how they are employed to counter-measure for detecting and defeating them. The smart kit also includes a foldout visual language translator and visual awareness guide. When Burnett arrived at the academy last year, he said it was his responsibility to make sure cadets receive the most realistic training possible. He hopes to have made good on that promise this summer with the MCIT and a few other elements added to Cadet Summer Training, such as military working dogs during Cadet Leader Development Training and a revamped Engineers lane. Cadets are also exposed to the military biometrics devices called BAT and HIIDE, which uses retina scans, fingerprints and text data to collect individual profiles on high value targets. This section of the Mobile Counter-IED Trainer even has the appearance of a workshop where insurgents would craft the deadly devices. Army of the linked web site or the information, products or services contained therein. For other than authorized activities such as military exchanges and Morale, Welfare and Recreation sites, West Point and the U. Army do not exercise any editorial control over the information you may find at these locations. Such links are provided consistent with the stated purpose of this Department of Army web site. Only questions or comments regarding the technical aspects of the Web site should be sent to the web master. If you are reporting a broken link, please help us by identifying the page or Web site where you found the link or web address. Please click here to send an email to the West Point web team.

Chapter 5 : Improvised Explosive Devices (IEDs) / Booby Traps

Visually identify indicators of improvised explosive devices (IED) Training Support Package (TSP) for the Marine Battle Skills Test (BST) TASK: Describe the visual indicators of improvised explosive devices (IED).

The bombs exploded in Dilsukhnagar, a crowded shopping area of the city, within metres of each other. It was further reported that there had been at least four similar bombings in Tamil Nadu during the preceding year. One woman was killed and another injured in the blast. Insurgents now use the bombs to target not only invading coalition vehicles but Iraqi police as well. Common locations for placing these bombs on the ground include animal carcasses , soft drink cans , and boxes. Typically they explode underneath or to the side of the vehicle to cause the maximum amount of damage; however, as vehicle armour was improved on military vehicles, insurgents began placing IEDs in elevated positions such as on road signs , utility poles, or trees , in order to hit less protected areas. IEDs in Iraq may be made with artillery or mortar shells or with varying amounts of bulk or homemade explosives. Early during the Iraq war, the bulk explosives were often obtained from stored munitions bunkers to include stripping landmines of their explosives. Despite the increased armor , IEDs are killing military personnel and civilians with greater frequency. May was the deadliest month for IED attacks thus far, with a reported 89 of the invading coalition casualties coming from an IED attack. In October , the UK government charged that Iran was supplying insurgents with the technological know-how to make shaped charge IEDs. They used barrack buster mortars and remote controlled IEDs. Members of the IRA developed and counter-developed devices and tactics. IRA bombs became highly sophisticated, featuring anti-handling devices such as a mercury tilt switch or microswitches. These devices would detonate the bomb if it was moved in any way. Typically, the safety-arming device used was a clockwork Memopark timer , which armed the bomb up to 60 minutes after it was placed [40] by completing an electrical circuit supplying power to the anti-handling device. Depending on the particular design e. However, some electronic delays developed by IRA technicians could be set to accurately detonate a bomb weeks after it was hidden, which is what happened in the Brighton hotel bomb attack of Initially, bombs were detonated either by timer or by simple command wire. Later, bombs could be detonated by radio control. Initially, simple servos from radio-controlled aircraft were used to close the electrical circuit and supply power to the detonator. After the British developed jammers, IRA technicians introduced devices that required a sequence of pulsed radio codes to arm and detonate them. These were harder to jam. Roadside bombs were extensively used by the IRA. Typically, a roadside bomb was placed in a drain or culvert along a rural road and detonated by remote control when British security forces vehicles were passing. As a result of the use of these bombs, the British military stopped transport by road in areas such as South Armagh, and used helicopter transport instead to avoid the danger. Most IEDs used commercial or homemade explosives, although the use of Semtex -H smuggled in from Libya in the s was also common from the mids onward. The IRA also used secondary devices to catch British reinforcements sent in after an initial blast as occurred in the Warrenpoint Ambush. Between and , the IRA detonated 19, improvised explosive devices IEDs in the Northern Ireland and Britain, an average of one every 17 hours for three and a half decades, arguably making it "the biggest terrorist bombing campaign in history". This mortality rate was far higher than other high risk occupations such as deep sea diving, and a careful review was made of how men were selected for EOD operations. The review recommended bringing in psychometric testing of soldiers to ensure those chosen had the correct mental preparation for high risk bomb disposal duties. The IRA engaged in an ongoing battle to gain the upper hand in electronic warfare with remote controlled devices. This approach by the British army to fighting the IRA in Northern Ireland led to the development and use of most of the modern weapons, equipment and techniques now used by EOD Operators throughout the rest of the world today. Hezbollah frequently used IEDs to attack Israeli military forces in this area up until the Israeli withdrawal, and the liberation of Lebanon in May Libya[edit] Homemade IEDs are used extensively during the post-civil war violence in Libya , mostly in the city of Benghazi against police stations, cars or foreign embassies. Typically used devices were pressure cooker bombs , socket bombs, pipe bombs, bucket bombs, etc. The devices were used more for the act of terrorizing the urban population rather

than for fatal causes, placed in front of governmental offices, street corners or road sides. Mainly, the home-made IEDs were responsible for destruction of majority of structures targeted by the Maoists and assisted greatly in spreading terror among the public.

Chapter 6 : Improvised explosive device | weapon | blog.quintoapp.com

An improvised explosive device (IED) is a homemade bomb constructed and deployed in ways other than in conventional military action. It may be constructed of conventional military explosives, such as an artillery round, attached to a detonating mechanism.

Difference from conventional shaped charges[edit] Formation of an EFP MPB mine showing the face of its explosively formed penetrator A conventional shaped charge generally has a conical metal liner that projects a hypervelocity jet of metal able to penetrate steel armour to great depths; in travel over some distance the jet breaks up along its length into particles that drift out of alignment, greatly diminishing its effectiveness at a distance. An EFP, on the other hand, has a liner face in the shape of a shallow dish. The force of the blast moulds the liner into any of a number of shapes, depending on the shape of the plate and how the explosive is detonated. A less sophisticated approach for changing the formation of an EFP is the use of wire-mesh in front of the liner: The liner of an MEFP generally comprises a number of dimples that intersect each other at sharp angles. Upon detonation the liner fragments along these intersections to form up to dozens of small, generally spheroidal projectiles, producing an effect similar to that of a shotgun. The pattern of impacts on target can be finely controlled based on the design of the liner and the manner in which the explosive charge is detonated. The penetration is proportional to the density of the liner metal; tantalum Tantalum is preferable in delivery systems that have limitations in size, like the SADARM, which is delivered by a howitzer. For other weapon systems where the size does not matter, a copper liner of double the calibre is used. Extensive research is going on in the zone between jetting charges and EFPs, which combines the advantages of both types, resulting in very long stretched-rod EFPs for short-to-medium distances because of the lack of aerostability with improved penetration capability. An EFP eight inches in diameter threw a seven-pound copper slug at Mach 6, or 2, meters per second. When activated the concave copper shape on top becomes an explosively formed penetrator. EFPs have been used in improvised explosive devices against armoured cars , for example [10] in the assassination of the German banker Alfred Herrhausen attributed to the Red Army Faction , [11] and by Hezbollah in the s. Explosive is loaded behind the metal liner to fill the pipe. Upon detonation, the explosive projects the liner to form a projectile. The effects of traditional explosions like blast-forces and metal fragments seldom disable armored vehicles, but the explosively formed solid copper penetrator is quite lethal â€”even to the new generation of mine-resistant vehicles which are made to withstand an anti-tank mine , and many tanks. This gives the operator time to judge the moment to fire, when the vehicle is moving more slowly. EFPs can be deployed singly, in pairs, or in arrays, depending on the tactical situation. The SIM-EFP is a construction that fits in between the military linear cutting charge see shaped charge and the platter charge see improvised explosive device. The main difference is how much the rectangular liner plate is bent. The construction also allows for longer timing errors, and makes it easier to hit fast moving vehicles. The SIM-EFP is a modified version of the platter charge, but the projectiles are better optimized for armour penetration instead of demolition, and spread out perfectly for effective killing of armoured vehicles optimized for long projectiles instead of a broad flat projectile. The simplified EFP design also makes it easier for small groups of motivated individuals to build big EFPs that can penetrate a heavy battle tank or stationary high-value targets of virtually any sort. Other examples of non-circular EFPs are U. It will be dropped off Hayabusa 2 on to an asteroid and detonated. The crater created by the impact will be a target for further observations by the onboard instruments. The shaped charge will consist of 4.

Chapter 7 : What appearance does an improvised explosive device have

That is the question posed by new data on the proliferation of improvised explosive devices (IEDs). While the IED is sometimes described as a new technology, it actually has a lengthy history.

Improvised devices are characterized by varying employment techniques. In most of the techniques shown below, an unexploded ordnance UXO can easily be engineered to replace a mine or explosive device using one of the several following techniques: Coupling is a method of linking one mine or explosive device to another, usually with detonating cord. When the first device is detonated, it also detonates the linked explosive. This technique is often used to defeat countermine equipment, such as mine rollers Rolling. The roller will pass over the initial, unfuzed device and set off the second fuzed device. This in turn detonates the overpassed device underneath the clearing vehicle. When the linked devices are directional fragmentation mines, they can create a large, lethal engagement area. Buried mines, UXOs, or other explosive devices are stacked on top of one another. The device buried deepest from the surface is fuzed. Fuzing only the deepest ordnance helps mask no- and low-metal explosive hazards placed near the surface. This reduces the probability of detection by metal detectors, and it increases the force of the blast. Sensitizing antitank AT mines. On some nonmetallic AT mines, the pressure plate is cracked and the spring is removed to reduce the pressure required to initiate the mine. Similarly, the pressure plate can be removed from metallic AT mines to create the same effect. A pressurefuzed AP mine can be placed on the top of an AT mine, thus creating a very large AP mine as an alternative method. AP mines may be used in daisy chains linked with other explosive hazards. Enemy forces may link the mines together with trip wire or detonating cord. When the initial mine is detonated, the other mines may detonate. This may also create large, lethal engagement areas. Booby traps and IEDs are similar to mines in that they are designed to kill or incapacitate personnel. They are also emplaced to avoid detection and improve effectiveness. Most are victim-activated, but some may involve remote or command detonation architectures. The use of booby traps is limited only by the imagination of the adversary. Booby traps are victim-activated devices intended to create casualties and terror and may or may not be found in areas of tactical significance. Are usually explosive in nature. Are usually activated when an unsuspecting person disturbs an apparently harmless object performs a presumably safe act; for example, souvenir hunting. Are designed to kill or incapacitate. Cause unexpected random casualties and damage. Create an attitude of uncertainty and suspicion, in effect lowering morale and inducing a degree of caution that restricts or slows movement. Assume that all mines are booby-trapped. Hand grenade with pin pulled, placed in a small glass with glass filled mortar or plastic of paris. Suicide vest-leather-look sleeveless waistcoat with explosives and ball bearing sewn into the interior. A hand grenade thrown into a building or dropped from a bridge. A rocket-propelled grenade RPG fired at a vehicle from the manufactured launcher. An RPG fired from an improvised launcher while the launcher is improvised, the round was fired as intended without modification. A landmine placed in the roadway using the manufactured fuze to initiate it as designed. Throughout the course of that war, 30 to 40 percent of trauma cases treated by Soviet medical personnel were caused by mine strikes. Necessarily, the Soviets adopted measures to improve force protection, gained a greater understanding of the effects of a mine strike on the body, improved casualty evacuation techniques, and implemented measures to plan for medical contingencies at the lowest level. Some simple mine countermeasures that increase mine strike survivability include- Training refresher in first aid. Training in mine awareness. Sandbagging the vehicle floors using fine aggregates because large particles become missiles. Riding on top of armored vehicles when the tactical situation permits. Leaving vehicle hatches cracked with the latch pin in place to permit dispersion of the concussive effects of a mine blast. Injuries sustained during a mine strike are caused by the pressure wave of the primary blast, the penetrating and nonpenetrating wounds of the secondary blast, and the injuries associated with being thrown some distance. The combat medic or lifesaver must be aware of multiple wounds and combination wounds that usually result from a mine strike and must know how to thoroughly treat the patient. Additionally, treatment of shock becomes important, especially since Fifteen percent of shock cases were irreversible, and the victim died in a short period of time.

Chapter 8 : U.S. Policies and Actions Aim to Counter the IED Threat | DipNote

Reducing the Threat of Improvised Explosive Device Attacks by Restricting Access to Explosive Precursor Chemicals prioritizes precursor chemicals that can be used to make HMEs and analyzes the movement of those chemicals through United States commercial supply chains and identifies potential vulnerabilities. This report examines current United.

Page 1 Share Cite Suggested Citation: Countering the Threat of Improvised Explosive Devices: The National Academies Press. IEDs may incorporate military stores, but they are normally devised from nonmilitary components. They always contain explosive materials, detonators, and triggering mechanisms; they are often cased and may use shrapnel. The term improvised may apply either to the construction of the device or to its use by irregular forces. Thus, a mine produced for regular forces may be considered an IED if it is used by irregular forces, but an unmodified mine placed by regular forces is not considered an IED. Explosive devices designed to disperse chemical, biological, or radiological material are generally not classified as IEDs and were not considered for this study. IEDs are used by terrorists to strike soft targets and by insurgents as weapons against a stronger enemy. They can be made at relatively low cost, are relatively easy to construct and emplace, and can achieve both strategic and tactical results. Page 2 Share Cite Suggested Citation: Two fundamental aspects of an IED campaign are its asymmetry and idiosyncratic nature. The adversary expects to move these audiences in ways advantageous to their cause. Counter-IED and counterinsurgency efforts are inexorably linked, and counterinsurgency concepts can be used as tools to defeat an IED campaign. The ability of the adversary to learn and adapt has been an important characteristic of IED campaigns. The time needed to adapt has typically been shorter than the time needed by counter-IED forces to deploy and implement IED countermeasures. Moreover, IED countermeasures often have the effect of shifting the threat from one device or tactic to another. That process includes obtaining funding and bomb materials, recruiting people, constructing the device, selecting the target, delivering the device to its target, carrying out the attack, and disseminating information about the attack for propaganda or other purposes. Together, such steps make up the IED threat chain. The elements of the threat chain can be grouped into three basic components: The adversary must have an organization of trusted people with secure communication, connections to outside sources of support, a public interface for recruitment and publicity, and some degree of popular support or tolerance. Destabilization of the organization would inhibit the ability to field an effective IED campaign. Key resources needed to support an IED campaign include people, materiel, money, information, facilities, and access to social networks. For each of those essential resources, there are observables, signatures, and opportunities for interception, tagging, tracking, rigging, or otherwise exploiting the contact to gain access to, or information about, the organization. Operations include items directly associated with the IED device, from weapon manufacture, storage, preparation activities, and the attack itself through postattack evasion. Most of the Department of Defense IED-defeat effort has been devoted to operations, which most resemble traditional military operations. Page 3 Share Cite Suggested Citation: However, limitations in understanding or in technical capabilities prevent that. The limitations suggest areas of basic research that are relevant to the IED challenge, and those areas are set out below. Relationships Between the Human Terrain and the IED Threat The human terrainâ€”the political, social, cultural, and economic environmentâ€”is a critical element at all stages of an IED attack, and it probably is also the most complex and the least well understood. Within the social and behavioral sciences, numerous methods can be used in novel counter-IED research. Formal mathematical modeling, statistical or quantitative analysis, and qualitative work, such as case studies and focused historical comparisons, can play an important role. Comparative case studies based on field research could be useful where such work is feasible. Survey research is highly relevant. Red teaming, gaming, and simulations may be useful to enhance prediction. A social-sciences research program aimed at countering IEDs would integrate a variety of behavioral and social-science methods and link social-science knowledge to the methods proposed by science and technology. That requires a wide variety of information including data from both human and technical sources, and the systematic inference of actionable knowledge from the fusion of the data. US forces need the capability to extract strategic and tactical actionable intelligence information

from massive amounts of diverse, potentially incomplete, and noisy data in a timely and dynamic fashion. Page 4 Share Cite Suggested Citation: For each detection opportunity, there are basic-research issues regarding the particular signatures, methods, and limits of detection. With respect to disruption, technical opportunities exist to improve current approaches or to make them more readily fielded in theater. Resource Availability and the IED Threat Available resourcesâ€”energetic material, initiators, triggering devices, knowledge, finances, and facilitiesâ€”are critical in determining the type, number, and effectiveness of IED attacks and directly influence the potential for detection and countermeasures. New capabilities and associated basic research are needed to exploit the dependence of the IED threat on those resources. The recommendations reported here are intended to supplement ongoing work and to provide a broader focus on disrupting the entire IED threat chain. The following recommendations represent research challenges in the five areas discussed above that are compelling based on their potential impact, the potential timeline for their payoff, and the relative level of current effort in these areas. Research should include identifying and analyzing key elements of the threat chain, such as recruitment, availability of technical expertise, diffusion of knowledge, popular support, and the networks and relationships among players. Research should develop a general understanding of how decisions especially those related to innovations, methods, targets, and timing are made and how information is communicated in underground organizations, and should examine adversary attitudes toward risk. Due to the role public support, tolerance, or aversion can play in an IED campaign, research should seek to develop better ways of gauging public opinion in different cultural, social, and political contexts and should develop a better understanding of the role of emotion, interpretation, understanding, values, images, and symbols in the IED threat Page 5 Share Cite Suggested Citation: Such research should draw on the fields of political science, political economy, sociology, religion, psychology, media and communication, criminology, terrorism studies, anthropology, history, operations research, and international studies. Decision theory, risk, cultural anthropology, and appropriate regional expertise are particularly relevant. Analysis of the IED problem should not focus exclusively on current conflicts but should anticipate other potential conflict zones by using the social sciences. Systematic attention should be paid to lessons learned and to their future application. Research can elucidate where and when the threat may migrate and what form it is likely to take. The role of the Internet as a source of information for constructing IEDs and for promoting the cross-national diffusion of ideas and tactics is a particularly important issue that should be examined. Researchers in political science, sociology, psychology, criminology, anthropology, history, media and communication, and international studies can all make valuable contributions. Research should address the continued development of theory and data to map patterns of social networks, especially during times of conflict and stress. Social-network research can be engaged to understand the conditions and characteristics that could encourage the formation of new networks that support security and stabilization rather than disruption and violence. Research can explore how identities are formed in and sustained by networks, how ethnicity or religion becomes a determinant of identity and may become a catalyst of violence, and how ethnic and sectarian divisions can be overcome. Research should aim to understand the dynamics of societies in the face of rapid and fundamental change. Studies should examine how to undermine terrorism or move to democracy for societies that have a variety of cleavages, values, and cultures. Researchers need to develop a deep understanding of varied cultures and societies and not focus only on those prone to violence; regionally focused Page 6 Share Cite Suggested Citation: