



EXPLOSIVES SAFETY BULLETIN

U.S. Army Technical Center for Explosives Safety (USATCES)
McAlester, OK 74501



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SECARMY & CSA Initiate New Safety Campaign Plan **Be Safe!**

The Secretary of the Army and Chief of Staff of the Army have recently initiated a new Army safety campaign - **Be Safe!** In FY 2003, the Army experienced 255 fatalities due to accidents. Although the major contributors to Army fatalities are POVs, Aviation, and AMVs, 21 of these fatalities were due to explosives and weapons related accidents, which is 8.2% of the total.

In a separate article in this bulletin, you will see the breakdown of the FY 2003 Army explosives related accident statistics. The new **Be Safe!** campaign calls on all members of the Army team to do their part in reducing the number of preventable accidents. Similar to the total Army accident statistics, we are seeing a rising trend

in the number of explosives related accidents and number of fatalities that we as members of the Army explosives safety community must work to reverse. This is a challenge in a high OPTEMPO environment of OIF/OEF, however, one we must meet as part of the Army team. To read more on this new campaign, visit the [Army Safety Center](#) homepage.



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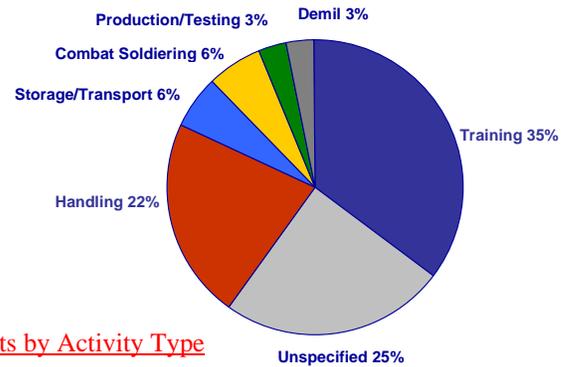
The **Explosives Safety Bulletin** targets the ammunition/explosives community. It is published quarterly by the U.S. Army Technical Center for Explosives Safety (USATCES), SJMAC-ESM, 1 C Tree Road, Bldg 35, McAlester, OK 74501. If you wish to submit an article or have any questions regarding the bulletin, please email bulletin@dac.army.mil. To subscribe/unsubscribe or correct your email address, use this [bulletin form](#).

FY 2003 ARMY EXPLOSIVES ACCIDENT ANALYSIS

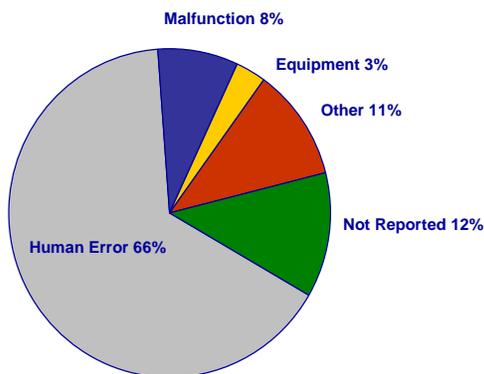
The US Army Technical Center for Explosives Safety (USATCES) has completed an analysis of the Army ammunition and explosives (A&E) accidents that occurred during FY 03. This analysis indicates a sharp increase in the number of accidents and is almost double that of FY 02. Many of the trends indicated in past years have been repeated and others identified. The trends we have identified are related to accident cause, activities producing the accidents and types of ammunition or explosives involved in Army explosives accidents.

During FY 03 the Army reported a total of 99 A&E accidents. Personnel injury or fatality was reported in 84 of the 99. There were 27 accidents resulting in property damage and 12 of these events resulted in a combination of property damage and injury/fatality. This number reflects a 77% increase over the number for FY 02. This increase is primarily due to the activities of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). Of the 99 accidents reported, 54 were directly related to OEF or OIF.

A review of the activities producing the accidents for FY 03 once again indicates training as the leading event. A new trend that has developed and risen to an alarming level is accidents involving weapons and ammunition handling. This elevated trend in handling activities is most likely due to the larger number of soldiers presently involved in the actual operations of OEF/OIF as compared to training. The chart at the right is a complete breakdown of the accidents by activity type.



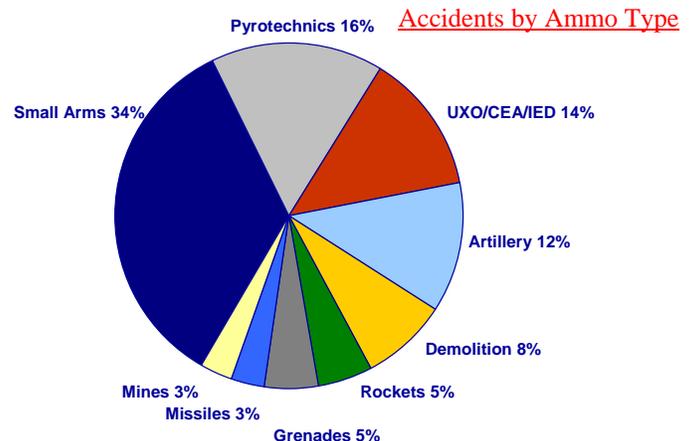
Accidents by Activity Type



Accidents by Cause

The most common cause of explosive accidents during this reporting period is human error. Of the 99 accidents reported 65 were caused by human error. There were 23 accidents reported with the cause listed as unknown or not reported. Of the remaining events, 8 were reported with cause as malfunction/material failure and 3 related to equipment. The 23 reported without cause are a significant percentage and without an indication of cause, corrective action cannot be properly implemented and lessons learned shared. The chart at the left is an illustration of the accidents by cause.

In analyzing the types of ammunition involved in the reported accidents, once again, small arms ammunition (SAA) and pyrotechnic ammunition produced the largest number of accidents. SAA was by far the most common with 34 and pyrotechnic type ammunition follows with 16 accidents. The remainder of the accidents involved artillery, demolition material, rockets, grenades, mines and other. The items within the "other" category relate to unexploded ordnance (UXO), captured enemy ammunition (CEA) and improvised explosive devices (IEDs) where a specific category of ammunition could not be identified. The chart at the right indicates the types of ammunition involved in the reported accidents.



continued on next page.....

....FY 2003 continued from page 2

The amount of UXO, CEA and IEDs encountered in OEF/OIF has made a significant impact on the Army and its mission. UXO is present in many theaters of operation and requires continuous training and awareness as soldiers operate in these areas. The items range from mines emplaced in conflicts of years past to ordnance that did not function when deployed. Considering the ongoing operations that soldiers are involved in at this time, the exposure level is very high.

Upon completion of this analysis, the USATCES has made some recommendations to The Office of the Director of Army Safety (ODASAF) including:

- The Army must do a better job of utilizing accident data in the training environment to inform soldiers of potential hazards with each weapon system and associated ammunition. Specific related accident data and information should be provided when soldiers receive their initial technical training on a weapon system.
- Increase Safety involvement in pre-deployment planning. Safety resources should focus on accident reduction in the areas of deployment, training, human error, small arms ammunition and pyrotechnic ammunition. The areas listed above are consistently the cause, activity or ammunition type involved in the greatest number of Army A&E accidents.
- Increase Command/Leadership attention on explosives safety during training and operational activities with an emphasis on UXO, CEA and IEDs.
- Increase Command/Leadership oversight and monitoring during training and operations through completion of the event to ensure established procedures are strictly followed.
- Conduct periodic Unit/Battalion level explosives safety refresher training on safe munitions handling procedures for all personnel who handle explosives and munitions.
- Increase Command and Army Leadership oversight of explosives accident/mishap reporting to ensure all Army explosives accidents/mishaps are reported, all required accident data is provided, and appropriate and meaningful corrective actions are taken to prevent future occurrences.
- All levels of US Army leadership must become more actively involved in explosives safety and ammunition/explosives accident prevention.

The complete FY 2003 Army Explosive Accident Analysis will be available on the USATCES website in the near future.

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**DON'T LEARN SAFETY BY
ACCIDENT**

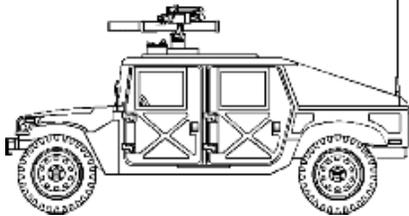


LESSONS LEARNED

Tree Fights Back ... Lessons Learned the Hard Way !!!

Overview of the Training Operation: Grenade and artillery simulators were used to simulate indirect fire for conducting the **React to Indirect Fire** task. Soldiers mounted in a M966 HMMWV threw simulators in the vicinity of dismounted troops to add a realistic environment to the event.

What Happened: The driver of the HMMWV attempted to throw a grenade simulator out his window while the vehicle was moving. The simulator struck a tree and rebounded through the rear window landing behind the driver's seat, which was also the area used to store the other grenade and artillery simulators. The driver yelled "grenade" to warn the passenger, and while trying to quickly halt the vehicle, he hit a tree. The vehicle stopped! He and the passenger attempted to exit the vehicle from the passenger side, but the passenger's gear became entangled on the door frame. Unable to escape, he crouched down, and the blast hit his upper body causing severe injuries. Students arrived to put out the fires caused by the explosion and administer first aid.



The HMMWV sustained \$30,000 of damage and the injuries resulted in a lost workday accident. The explosion was strong enough to severely damage the cab of the HMMWV. The floor, seats, doors, and instrument panel on the driver's side were destroyed, and the doors from the driver side blown almost 100 feet. All of this from pyrotechnics ... most Soldiers do not even consider them real explosives.

Even though the safety annex of the OPORD did not address use of pyrotechnics, there were established procedures for handling the pyrotechnics. The Soldiers were supposed to stop the vehicle, open the door, step out with at least one foot on the ground, and throw the simulator on a sandy area away from troops and vehicles.

Lessons Learned

1. **NEVER** throw ammunition or explosives from vehicles, moving or stationary.
2. **ALWAYS** make sure the target area and path to the target is clear of any obstacles.
3. **CONDUCT** orientations for safe handling of pyrotechnics every time they are used. Handling explosives is done infrequently and is a perishable skill.
4. **INCLUDE** safe use of ammunition and explosives in every operations order and risk assessment.
5. **UNPACK** only what is needed for immediate use.
6. **STORE** ammunition and explosives outside the passenger compartment whenever possible.
7. **GIVE** explosives 100% of your attention – who knew a tree would fight back!

To read the accident report, go to ESMAM – Army Mishaps – ID View - #20030625003

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SHOW-STOPPERS

As an explosives safety professional, Quality Assurance Specialist (Ammunition Surveillance) (QASAS), or Ammunition Manager, it's easy to become complacent about explosives safety. A lack of serious mishaps or explosives safety violations can lull you into a false sense of safety. Fortunately, explosives accidents do not occur often, but when they do, it is normally catastrophic. To guard against complacency, use your next rainy day to consider whether any potential 'show-stoppers' might exist right under your nose.

What exactly is a show-stopper? These are facilities that by reason of their vital strategic nature, or high intrinsic value of their contents, should not be placed at risk. Defining a show-stopper is the easy part; the challenge is to recognize one when you see it.

The key to spotting show-stoppers is to understand the function of all facilities that could be at risk from an explosion and recognize that quantity-distance arcs are not absolute safety. Take a close look at the facilities within or near your explosives safety clear zones on your installation explosive location map. Are you certain of the purpose and occupancy of the buildings inside or near the clear zones or have you been making some assumptions? A new safety manager I know was exploring a plain-looking building near his parked combat aircraft. He assumed it was a heating plant because of the huge pipes going in and out of it. Imagine his surprise when the facility turned out to be the primary fuel pump house for the flight line. His new understanding of the building's function helped him recognize it as a potential show-stopper.



Once you understand a facility's function, the next step to recognizing a show-stopper involves answering a simple question: "How would my mission be affected if this facility were badly damaged or destroyed?". The impact on the mission will help you decide whether you've got a true show-stopper or not. In the example of the fuel pumphouse, the safety manager realized its destruction would cut off fuel to the entire flight line and shut down all flying operations! Playing the 'what if' game with the facilities inside your clear zones may give you a new appreciation of their importance to the mission.

Show-stoppers can escape our notice precisely because they're often not very obvious. Consider bulk tanks for aircraft de-icing fluid. The fact that the fluid isn't flammable may have led someone to allow it very close to explosives on the flight line. During winter operations, however, the loss of de-icing fluid from an explosion could keep aircraft grounded just as effectively as a loss of fuel would. Your base may not have de-icing fluid or aircraft, but the principle is the same wherever you are: understanding a facility's function and the impact of its loss can expose a show-stopper that's been lurking for years.

Of course, it's not enough to merely recognize show-stoppers; they have to be identified to the right decision maker so the risk can be dealt with. Your leadership has the responsibility and authority to deal with risk. Don't keep things to yourself; identify the risks appropriately so the decision makers can do their job.

Like to see exciting things and meet interesting new people? Good: climb into your Safety truck and head for your clear zones! Go inside all the facilities and ask the occupants what they do. You'll be surprised how glad they are to tell you about their jobs and how they support the mission. Don't let a lack of mishaps lead you into complacency. Be on the lookout for potential show-stoppers - *before* they shut your mission down. As you can probably tell from the content, this article was provided to us by an Air Force reader of the Explosives Safety Bulletin, however it is certainly applicable to all the Services and we appreciate the contribution of this reader.

Provided courtesy of:
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POLICY AND REGULATION CHANGES

With this issue of the Explosives Safety Bulletin, we are introducing a new section in which we will highlight recent DOD and Army explosives safety policy and regulatory changes. Because many of these changes have an impact on Army ammunition and explosives operations, it was felt we needed to publicize these changes.

1. **Expendable Small Arms Ammunition Demilitarization Equipment** – The DDESB has approved new siting criteria for demilitarization processing equipment and operations for expended .50 caliber and smaller cartridge cases. In summary, this equipment, such as brass deformers, does not require a site plan if it is located outside the Inhabited Building Distance (IBD) arc from all Potential Explosion Sites (PES). If it is located inside the IBD arc, it must be sited at Intraline Distance (ILD) from all PESs except the PES to which it is integral. It must also have a DDESB approved site plan. Specific criteria is found in the latest version of DOD 6055.9-STD, paragraph C9.8.19. The latest version of DOD 6055.9-STD may be found on the DDESB website at: http://www.ddesb.pentagon.mil/Rev%204_Rewrite%20DoD%206055.9-STD_5%20Jan%2004.pdf.

2. **Ammunition and Explosives Roll-On/Roll-Off Operations** – The DDESB at their 326th Board Meeting approved new criteria for siting military ammunition and explosives Roll-On/Roll-Off (RORO) operations. The new criteria exempts those operations involving 50,000 pounds Net Explosive Weight (NEW) or less, and lasting no more than 24 hours from having a DDESB approved site plan. Those operations involving NEWs greater than 50,000 pounds or lasting longer than 24 hours must be sited IAW DOD 6055.9-STD. The new criteria also establish provisions for contingency and other similar operations that require a documented risk assessment approved IAW DOD component procedures. The approved policy can be found on the DDESB website at: <http://www.ddesb.pentagon.mil/326th%20mtg%20of%20DDESB.pdf>.

3. **NABCO Blast Containment Vessels** – The DDESB on 16 April 2004 approved the NABCO SV-50 Explosive Storage Vessel for use by the Military Services. For further information, see the articles on NABCO Explosive Containment Vessels elsewhere in this bulletin.

4. **Quantity Distance Separation for Security Barracks** – In response to an inquiry from an Army MACOM, the DDESB recently clarified Quantity-Distance (QD) separation requirements for security barracks. Siting requirements are as follows:

a. Security barracks that house **on-duty**, quick reaction force personnel may be located at intraline distance (K18) from a Potential Explosion Site (PES), if no barricades are provided. Properly hardened barracks may be located at K9 intraline distance.

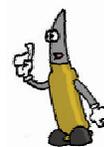
b. Security barracks that house **off-duty**, quick reaction force personnel will be located at inhabited building distance from a PES.

c. Any barricades employed in order to reduce intraline distances above must be designed, built, and maintained to the criteria of DOD 6055.9-STD, Chapter 5.

d. A risk assessment of the window panels in the security barracks must be performed and blast resistant windows installed where needed. The assessment will be included in any site plan submission.

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BE SAFETY SMART RIGHT
FROM THE START



STORAGE CONSIDERATIONS WHEN USING REDUCED QD CONTAINERS

New technology now allows the placement of explosives much nearer to inhabited buildings than previously allowed. This technology consists of specifically designed containers, such as the NABCO SV-23 pictured below, which have been shown through testing to contain hazardous effects resulting from an internal detonation of its explosive contents. Some of these containers such as the NABCO SV-23 and Golan 10 allow



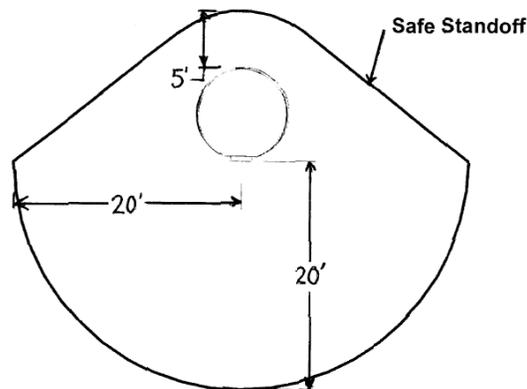
the storage of explosives as close as 15 feet from an inhabited building. Placement of these containers this close to populated areas raises specific concerns related to the

handling of munitions in the vicinity of these containers. The Department of Defense Explosives Safety Board (DDESB)- approved explosives limits and quantity distance (QD) for these containers only applies to explosives material in storage, with the door closed. The DDESB approval requires other operations (e.g., unpacking or packaging, breakdown, cutting, charge set-up) to be conducted at a location sited in accordance with DoD 6055.9-STD criteria for the material being handled. Obviously you need to take items in and out of the container, but unpacking and issuing of munitions must not be conducted in the immediate vicinity unless operational considerations warrant. For example, these containers are sometimes used for storage of operational loads near headquarters locations for base defense purposes. However, opening of the container should be limited to the minimum required for inspections and inventory. Day-to-day handling of munitions should not take place near inhabited buildings unless default QD criteria from DA Pamphlet 385-64, for the operation being conducted, can be met. The cardinal principle for explosives safety still applies to reduced QD scenarios. Exposures should be limited to the minimum amount of explosives and the minimum number of people should be exposed for the minimum amount of time consistent with safe and efficient operations.

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NEW DDESB-APPROVED STORAGE CONTAINER

The Department of Defense Explosives Safety Board (DDESB) recently approved a new container that allows storage of up to 50 pounds of HD 1.1 explosives with reduced quantity distance (QD). The container is manufactured by NABCO, Inc, Pittsburgh, PA, and is called the NABCO SV-50. This container is also DDESB-approved for storage of fragmenting munitions that are 1.6 pounds NEW or smaller. Inhabited building distance (IBD) for the SV-50 is baseball-field-shaped with a distance of 20 feet out the sides and front and 5 feet out the rear (see diagram). Internal lighting and an intrusion detection system (IDS) are available for the SV-50. A copy of the entire DDESB approval memo is available on the USATCES website under "Resources" and "Common Explosives Safety References". Information on the container is available from NABCO, Inc., (724) 746-9617 or at www.nabcoinc.com.



SV-50 Inhabited Building Distance (IBD) arc.

MSDS FOR AMMUNITION ITEMS

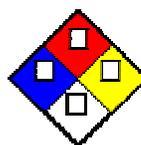
The Defense Ammunition Center/US Army Technical Center for Explosives Safety is frequently asked to help locate Material Safety Data Sheets (MSDS) for explosives or ammunition items. The US Department of Labor Guidelines for Employer Compliance (29 CFR 1910.1200, App E) says that employees have both a need and a right to know the hazards of the materials they are using and what measures should be employed to protect themselves from the adverse effects of these materials. An MSDS is a document that contains this information. 29 CFR 1910.1200 requires chemical manufacturers, importers, and distributors of hazardous chemicals to provide the appropriate labels and MSDS to users when they ship the chemicals.

Executive Order 12196 and 29 CFR Part 1960 specifically exclude creating an MSDS for DOD ammunition items; only the hazardous materials they contain would have one. The best source of MSDS for ammunition components is the plant that makes them. The manufacturer can be determined by checking the Ammunition Data Card. For the MSDS on HE items, you can contact Holston AAP, DSN 748-6286. For propellants, contact Radford AAP, DSN 931-2705.

Hazard determination is the responsibility of the producers and importers of the chemicals. This doesn't mean the local Safety Specialist/Manager doesn't have to evaluate the hazards of using chemicals locally. It just means they don't have to make their own MSDS unless they are actually producing their own chemicals. Every container of hazardous chemicals you receive must be labeled, tagged, or marked with the required information. Suppliers must also send a properly completed MSDS at the time of the first shipment of the chemical, and with any shipment after the MSDS is updated with new and significant information about the hazards.

There are many sources of MSDS available on the Internet. Most of the web sites offering MSDS are available to anyone, although some require a paid subscription. The official DOD webpage, Hazardous Material Information Resource System (HMIRS),

requires a password and a request is available on the webpage listed below. Since I received so many questions on this, I decided to compare the sites. I chose TNT, trinitrotoluene, as my standard. I searched for the MSDS by using only the abbreviation TNT. Although I am sure there are probably other webpages where you could find an MSDS for TNT, I found it on these webpages:



Material
Safety
Data
Sheet websites:

<http://www.dlis.dla.mil/hmirs>. *(Click on "Connect to HMIRS". Although I found the MSDS for TNT on the HMIRS webpage, I could not find it by searching for TNT. I had to search by FSC and then look through all the MSDSs listed.)*

<http://www.setonresourcecenter.com/MSDS/index.htm>

<http://siri.org/msds/index.php>

<http://ull.chemistry.uakron.edu/erd/>

<http://www.msds.com/> *(limited access without subscription)*

<http://163.1.219.1/MSDS/#MSDS>

<http://msds.pdc.cornell.edu/msdssrch.asp>

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FY 2003 DDESB SURVEY SUMMARY

Each fiscal year, the Department of Defense Explosives Safety Board (DDESB) Secretariat conducts explosives safety surveys and evaluations of selected Army ammunition and explosives facilities to determine compliance with applicable explosives safety standards. A report providing the results of the survey is generated for each evaluation and forwarded to the Department of the Army, Chief of Staff, Safety (DACS-SF).

A copy of each report is sent here and the information from the report is entered into our survey database. The database is used to facilitate the tracking and review functions that USATCES is tasked with providing. It is also used, we hope, to provide the field with useful information concerning survey results.

All of the survey reports for each of the Army locations visited during fiscal year 2003 have been received and entered in our database. An analysis of this data was done to summarize the deficiencies found by the Secretariat. The results of this effort are finished and available for your review on our website, [FY 2003 Survey](#).

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With this issue, we are introducing new sections in which we will publish each bulletin:

**Frequently Asked Questions
Lessons Learned
Policy/Regulation Changes (if any)**

FREQUENTLY ASKED QUESTIONS



Is there a Safe Separation Distance (SSD) for cell phones around maintenance lines and Surveillance workshops when electro-explosive devices (EEDs) are and when they are not in the building?



SSDs for cell phones and radio transmitters can be computed using Table 6-4 in DA PAM 385-64. SSDs can be computed for shielded and unshielded munitions. See Note 4 to the table to see which packs are considered shielded or unshielded. General engineering guidance we have for cell phones is due to their low power, maintain a SSD of 10 feet from RF sensitive munitions. Radios are a little different because transmitter power varies for different radios so the formulas would apply. It's unsafe to use radios inside ammunition buildings because of the possible presence of RF sensitive munitions, especially those that may be unshunted for an operation.



Does a commercial Port under the US Coast Guard control require a Site Plan/Waiver?



Any operation that involves DOD titled Ammunition and Explosives requires an approved site plan unless specifically excluded by the DOD 6055.9-STD, DOD Ammunition and Explosives Safety Standards. If a commercial port is used on a recurring basis for DOD ammunition operations, a site plan is required. If the quantity distance requirements cannot be met, then a waiver or exemption with a risk assessment is required. Also, it has been Army policy that even if a commercial port is not being used on a recurring basis, based on risk, we have required that a waiver be prepared and approved for each occurrence that the port is used.



DA PAM 385-64, page 143, Section 11-5a states that vehicles moving over the road to port will have as a minimum two 10BC fire extinguishers. Does this pertain to commercial/military vehicles traveling over public highways only, or does it include government vehicles transporting ammunition from one point on terminal (such as a pad) to another point on terminal (such as a wharf) that may be located as far as seven miles from each other?



You have quoted your question from "Port Operations" which is fine; however, you will find your answer for fire extinguisher requirements for government vehicles, on-post, hauling A&E in Chapter 7, Section II, Motor Vehicles, paragraph 7-6b(1) where it discusses the inspection of extinguishers and in Chapter 7, Section II, paragraph 7-8d which states "All Government trucks transporting any DOT class of explosives (both on-post and off-post) will be equipped with two portable fire extinguishers rated class 10BC or greater".

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To submit any ammunition/explosives related question for a quick response, go to AmmoHelp on DAC's website at <http://www.dac.army.mil/ammohelp>.

FREQUENTLY ASKED QUESTIONS

Q “We plan to construct a building in an area that we suspect contains UXO. We’ll need to do some excavation for the foundation, parking lots, and so forth. We’ll have qualified UXO personnel handle the UXO part of this project, so we can dig safely. Is an explosives safety submission (ESS) required for this UXO construction support?”

(Note: The following answer represents "best practices" that are being incorporated into emerging DOD guidance on operational ranges and on munitions response).

A Yes. An ESS is required for construction support to remove UXO in the construction footprint.

Construction Support is generally defined as assistance provided by DoD explosives ordnance disposal (EOD) or unexploded ordnance (UXO)-qualified personnel and/or by personnel trained and qualified for operations involving chemical warfare material (CWM) during intrusive construction activities on property known or suspected to contain CWM, regardless of its configuration, or munitions and explosives of concern (MEC) (e.g., UXO, discarded military munitions) to ensure the safety of personnel or resources from any potential explosive or chemical agent hazards.

An ESS is required, before intrusive activities occur, for construction support where the probability of encountering CWM, regardless of its configuration, or MEC is considered moderately or highly probable. Normally, this would apply to areas (e.g., former areas used for: live-fire training, other than exclusively with small arms ammunition; as operational range impact areas; for open detonation of excess, obsolete, or unserviceable munitions) for which a search of available historical records and/or on-site investigation data indicates that, given the military or munitions-related activities that occurred at the site, there is more than a low probability that CWM or MEC are present.

An ESS would not normally be required for construction support at areas where the likelihood of encountering CWM or MEC is considered possible, but not probable. Examples of such areas may be areas (former ranges) used for: live-fire training exclusively with small arms ammunition; for maneuver training, to include maneuver training involving the use of smokes, pyrotechnics and simulators; and as firing points.

When construction (e.g., construction of a target system, a new range road) is to occur on an operational range that will not preclude the continued use of the area as an operational range, an ESS is not required for construction support; however, to help ensure the safety of workers from known or suspected explosive hazards, a risk analysis and a range clearance plan approved by the installation commander are required. (Please read the following article entitled “Intrusive Activities on Operational Ranges”).

(Note: The following article represents "best practices" that are being incorporated into emerging DOD guidance on operational ranges and on munitions response).

Intrusive Activities on Operational Ranges

It is often necessary to perform range clearance activities that may involve ground disturbing or intrusive activities within the boundaries of an operational range, on which a variety of military munitions may have been used, and that is known or suspected to contain unexploded ordnance (UXO). Examples of such activities include: range modernization, target maintenance or installation, road construction, and drilling holes for fence posts or environmental monitoring. Range clearance is generally defined as the recovery, collection, and on-range destruction of used military munitions (e.g., UXO), munitions debris, and other range-related debris (e.g., targets) on operational ranges to maintain or enhance operational

continued on next page.....

....Intrusive continued from page 11

safety or to sustain the continued use of the range for its intended purpose. The term "range clearance" does not include the on-range disposal or burial of military munition and munitions constituents, when the burial is not a result of normal use.

Recently, two accidental detonations of subsurface UXO or discarded military munitions occurred during intrusive activities on property known or suspected to contain explosive hazards. One occurred while auguring a borehole at a munitions open detonation site. The other occurred during range maintenance while digging a fence hole in an operational range's impact area. In the second case, a surface clearance had been performed of the area in which the digging occurred. Both detonations resulted in serious injuries to the workers.

Both detonations could have been avoided. How? Never perform ground breaking or intrusive activities on an operational range or at other areas (e.g., a demolition range) known or suspected to contain UXO without:

- Authorization of the installation commander.
- Permission from Range Control.
- A risk assessment that evaluates the potential hazards associated with the proposed activity and methods to mitigate any potential exposures.
- A range clearance plan for either UXO avoidance support or UXO construction support.

Range Control is responsible for identifying areas known or suspected to contain UXO and other explosive hazards where ground disturbing or intrusive activities are prohibited, or where personnel performing such activities must be provided UXO avoidance support or UXO construction support. Ask Range Control about the area in which such activities are to be performed before planning or performing ground disturbing or intrusive activities on an operational range!

- UXO avoidance support is generally defined as techniques employed on property known or suspected to contain UXO or other munitions that have experienced abnormal environments, to avoid contact with potential explosive or chemical agent hazards, to allow entry to the area for the performance of required operations.

-- If you request UXO avoidance support, qualified EOD or UXO-qualified personnel will guide you through the range areas and will use instruments (e.g., metal detectors) to find a safe place to dig. They won't let you dig where their instrument say you'll run into metal. That metal could be UXO!

-- Generally, UXO avoidance support can be used when you have some flexibility as to where you can dig. Examples include: drilling groundwater monitoring wells, digging fence holes, or identifying a safe temporary vehicular path into an area of an operational range not already serviced by an existing road.

- UXO construction support (construction support) is defined in the FAQ article in this Bulletin. UXO construction support does more than just help you avoid UXO. UXO construction support anticipates that UXO may have to be removed to allow you to safely perform ground breaking or intrusive activities.

-- If you have no flexibility as to where you must dig, UXO avoidance support probably will not fit your needs unless you luck out and the metal detectors don't "ring off" on some metal beneath the surface. In all likelihood, you will need UXO construction support.

-- Start out by conducting an assessment to determine if the probability of encountering UXO is "Low" or "Moderate to High." A "Low" probability requires on-call support where EOD or UXO-qualified personnel will respond in case something suspicious is unearthed as you dig. A "Moderate or High" probability requires dedicated UXO construction support to remove the UXO before you dig. Your assessment and your range clearance plan should be approved by the installation commander or a designated representative.

Although an explosives safety submission to DDESB is not required for range clearance activities involving ground disturbing or intrusive activities on operational ranges, a risk assessment and range clearance plan will help avoid accidents during such activities!

USATCES

Explosives Safety Knowledge, OE & Chemical Div

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USATCES APPLICATIONS



[Joint Hazardous Classification System \(JHCS\)](#) (login required). On-line database containing final classification data.



[Explosives Safety Mishap Analysis Module \(ESMAM\)](#) (login required). Contains reports of explosive mishaps and malfunctions for all services of DOD.



[Chemical and Biological Event Reporting \(CBERS\)](#) (login required).



[Webcat](#). On-line catalog listing collections we have to include technical reports, journals, archival documents, and accident reports.



[Explosives Safety Bulletin](#). Listing of all bulletins by table of contents or full text.

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Explosives Safety Mishap Analysis Module (ESMAM)/Joint Hazard Classification System (JHCS) database link: <https://www3.dac.army.mil/esidb/login/Default.asp>