U.S. ARMY TECHNICAL CENTER FOR EXPLOSIVES SAFETY

EXPLOSIVES SAFETY

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AMMUNITION RESIDUE

Army units turning in excess items to the Defense Reutilization Marketing Office (DRMO) should take note of a recent incident. A customer who purchased a number of empty 2.75-inch rocket containers from the DRMO thought he got much more than he paid for. When he opened the crates at his home, he discovered that two of them contained live practice rockets. The rockets were returned to DRMO without incident and were handled by the explosives ordnance disposal (EOD) team; however, this could have had extremely serious consequences.

Units turning in crates or containers that have held any munitions should double check to ensure that the containers are, in fact, empty. Procedures for turning in ammunition and residue are contained in AR 710-2-1. Commanders and other leaders should hold those people that certify the safety of explosives articles or containers accountable.

by: CW3 Cross
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PROPELLANTS CONTRIBUTE TO EXPLOSIONS

Many believe that propellants do not contribute to detonations, or only a small amount, perhaps 10 to 20 percent, contributes to detonations. So, when determining storage weights, they only want to include the high explosives (HE) component.

Now we have evidence that this belief is in error. In fact, this evidence supports the official DOD policy that the storage weight (net explosives weight [NEW] for quantity distance [QD]) is the sum of the Class 1.1 material and the Class 1.3 material.

We recently received the report, "TNT Equivalence of Selected U.S. Army Gun Propellants," Michael M. Swisdak, Jr., Indian Head Division, Naval Surface Warfare Center, IHTR 1741, 2 December 1994. The report summary says,

"Based on the analysis of the data presented above, it is evident that all of the propellants tested reacted quickly enough to contribute to the airblast. Further, based on the airblast, the reaction was essentially indistinguishable from a detonation."

The report goes on to say,

"For purposes of hazard classification and entry of the information derived from these tests into the Joint Hazard Classification System, all three of the items tested, M1, M6, and M30A1 (all in the multi-perforated grain configuration), should be considered to have a TNT equivalence of 100%"

Requests for this document must be referred to Commander, Indian Head Division, Naval Surface Warfare Center, Indian Head, MD 20640-5035, Code 90 via 102.

by: Mr. Mark W. Skogman
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UNEXPLODED ORDNANCE (UXO) HAZARDS TO THE PUBLIC

Many residents of former defense facilities know the Govern ment had some type of firing range in the area, but few know wha was used or the hazards inherent with "dudded" ammunition items

Most discarded small arms ammunition (SAA), or component thereof, have no more related hazard than a box of shotgun shell unless someone attempts to set an unfired cartridge off by usin inadvisable methods. An unexploded projectile, rocket, or bom may be a dud, having an activated detonator that produced n response, or an item which simply impacted soft ground and di not detonate or did not detonate because the impact was not har enough to function the fuze. Whatever the cause, all of thes rounds look the same and, in the case of the latter two, their fuze are still armed and ready to fire.

Old ammunition may have sensitized high explosive (HE) fille because of the rounds' exposure to the deteriorating effects of th natural elements. This explosive filler is no less powerful becaus it is old. It just may be easier to detonate. In addition, the initiatin systems in the fuzes may already be under pressure as a result o the original impact. Consequently, a drop or a kick may hav sufficient force to complete the initiating process and detonate th round.

Souvenir hunters often take home pieces of UXO and displa them with pride to family and friends, exposing all involved t possible injury and death. Some former impact areas reveal thei locations when rain washes projectiles to the surface on colleg campuses or home owners find rockets or mortar rounds in thei suburban yards. Few of these discoveries are ever noted or reporte unless someone picks up one of these items and the results ar written in the headlines.

Do not touch UXO items. The variables within the ammunitio components themselves make it dangerous for anyone to be aroun the UXO item. Mark the item's location and report it to the loc law enforcement authorities. They will contact the military Ex plosive Ordnance Disposal (EOD) detachment responsible for th region, and EOD will dispose of the item(s). A private citize should not try to contact EOD because EOD units will usually onl respond to requests from an official agency.

In areas where the risk of encountering UXO is high, the publi needs to be constantly informed about the hazards of handlin unexploded ammunition items. Public service messages can b periodically placed in the newspaper and flyers be put on bulleti boards showing ammunition items that may be found in the are and describing actions to take if they are found. Classes or as semblies may be given to educate school-age youngsters about th consequences if ordnance is found and handled. It should b stressed to young people not to touch an item if they identify it a ordnance, but to mark its location and report it to an adult. Thes efforts may cost time and money but the alternative could possibl result in a much higher price.

by: Mr. Greg Lippman
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SPECIFIC OPERATION ASSISTANCE REVIEWS (SOARS)

For the past several years U.S. Army Technical Center for Explosives Safety (USATCES) has provided explosives safety assistance to installations by reviewing specific operations for compliance with explosives safety standards. These visits began at ammunition production facilities under the control of U.S. Army Armament, Munitions and Chemical Command (AMCCOM) and have expanded to other facilities of the U.S. Army Materiel Command (AMC).

These assistance visits provide value to both the installation and USATCES. The installation gains by having "eyes" with different experience review operations and USATCES gains by their personnel becoming more familiar with the operations and staff of their customers. In the past these have focused on a variety of areas including lightning protection systems (LPSs), range operations, specific production operations, and assisting commanders in doing a wall-to-wall explosives safety evaluation. They can be tailored to meet the needs of any installation. The product of these visits has generally been a report, a summary of comments and observations, which has been provided to the installation commander for his use.

Keep in mind these visits are not inspections in the traditional sense. There has typically been no requirement for response on the part of the installation, although USATCES will provide follow up assistance as required. SOARs have ordinarily been conducted by action officers from USATCES and have lasted from one to two weeks depending on the needs of the installation. This team could be supplemented by additional members from the major Army command (MACOM)/major subordinate command (MSC). If the SOAR is conducted at the request of a MACOM or MSC, routing of reports can be adjusted as necessary. Questions regarding the applicability/availability of this assistance should be referred to Mr. Mike Wheless at DSN 585-8806.

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INSPECTION AND TESTING OF LIGHTNING PROTECTION SYSTEMS (LPSs)

Inquiries from field activities indicate that SOP content for LP is a "gray" area at some installations and requires further clarification.

When preparing an SOP for LP, there are particular areas to address in order to comply with DA and Department of Defense (DOD) standards regarding inspection and testing of these systems. As a minimum, the following areas should be included in an SOP of this nature:

- Assure test equipment meets the required accuracy parameters and calibration labels are current.
- Specific individuals and/or organizations should be designated with the responsibility for scheduling and accomplishment of the LPS inspection and testing program.
- Include procedures for visual inspection of aboveground subsystems.
- The test procedure for the below ground earth electrode system, is the three point fall-of-potential test. The instrument requirement, is a three or four terminal type specifically designed for accomplishment of resistance to earth testing.
- Include steps for performance of the bonding test. Bond checks are conducted to assure that there is no deterioration at the junction points of the aboveground portion of the LPS. This test also verifies bonding of appropriate sized metal masses. Most three or four terminal testers are convertible to a two terminal mode for bond testing or a separate instrument may be utilized providing accuracy parameters are met.
- A plan should be included for the collection, dissemination and retention of test results/readings (The recorded test readings should be the actual numerical value obtained at each test point). Currently, test data is to be retained for a period of twenty years by the installation safety organization or other office as designated by the commanding officer. Also include sample inspection forms to be utilized for recording of test results and readings
- To assure consistency during each testing procedure, include illustrations of explosives facilities depicting specific points to be tested.
- A plan should be developed to ascertain that all LPS deficiencies are repaired in a timely manner. Repair actions should be prioritized based on the nature of the deficiency, type and sensitivity of explosive material, and results of a risk analysis. In extreme situations, rewarehousing of magazine contents should be considered.

The applicable reference to be utilized for LPS requirements for the Army is draft DAP 385-64, Ammunition and Explosives Safety Standards, Chapters 6 and 12.

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USING REDUCED INTRALINE (IL) DISTANCES FOR HAZARD CLASS/DIVISION (HC/D) 1.2

Periodically we receive a site plan where the installation will try to site HC/D (08)1.2 or (12)1.2 at an IL distance of 200 feet based on footnote 1 in table 5-15, draft DAP 385-64, Ammunition and Explosives Safety Standards. This footnote states, "If the HE in the items at an operating line PES is limited to 5,000 pounds, intraline distance may be reduced to 200 feet." This footnote does not apply to storage. It applies to maintenance lines only.

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EXPLOSIVES LICENSING OF ARMS ROOMS

An explosives license is required for Arms Rooms which store only Hazard Class/Division (HC/D) 1.4 ammunition. This will allow someone in the safety community to look at these Arms Rooms, and assure the fire fighters and security folks know where the bullets are located. For questions regarding explosives licensing contact: Director, USATCES, ATTN: SIOAC-EST, Savanna, IL 61074-9639.

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PLACEMENT OF SURGE ARRESTORS AT EXPLOSIVES FACILITIES

Lines supplying power to explosives facilities should have surge arrestors placed on them at the building to be protected. Placing the surge arrestor at the primary side of the transformer is a common practice that protects the transformer. This placement leaves the line from the secondary side of the transformer to the explosives facility unprotected from a direct lightning strike or from induced currents from a nearby lightning strike despite the fact that the power line will run underground for the last 50 feet. These currents can cause failures in sensitive electrical circuits or overwhelm these circuits and start fires. In order to provide protection to these circuits and prevent electrical appliance fires, the incoming power line should have a surge suppressor shortly before the power enters the service box.

by: Mr. Greg Heles
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FROM THE OFFICE OF THE PROGRAM MANAGER FOR UNDERGROUND AMMUNITION STORAGE TECHNOLOGIES (PMUAST)

The UAST program has generated a series of technical reports detailing initial results of the research and development (R&D) efforts. Reports currently available are listed below. As the titles indicate, these reports are very technical in nature and are basically the results of individual studies and experiments which will lead to development of a facility design and revised explosives safety criteria. Design and criteria development and approval are planned for 1996.

Plans are to make the publications available for distribution through the Defense Technical Information Center (DTIC) in the future. In the interim, publications may be requested by writing to the following address: U.S. Army Engineer Waterways Experiment Station, ATTN: CEWES-SD (Mr. C. Joachim), 3909 Halls Ferry Road, Vicksburg, MS 39180-6199 or by telephone at (601) 634-2245.

UAST NO.	TITLE
93-001	S-Cubed SHARC Calculations of Munitions Storage Magazine Model
93-002	The Influence of Geometric Approximations on Computational Results in Complex Tunnel Configurations
93-003	Evaluation of Fragment Ricochet and Secondary Damage Potential from a Detonation in a Storage Tunnel
93-004	Improved Techniques for Measuring Thermal Effects of Propellant Burn Tests in Confined Areas
93-005	Final Report, Explosive Effect Modeling of Self-Sealing Underground Explosive Storage Chamber Designs
94-001	Dynamics and Kinematics of Oblique Impacts of Steel Fragments on Rock Surfaces
94-002	New Underground Ammunition Storage Technologies: Review and Evaluation of Technical Literature
94-003	Final Report, Underground Ammunition Storage Facilities Analysis
94-004	Explosion Effects: Measurement and Prediction, Comparisons of TOPAZ 1-D Code Predictions wi Measurements from Explosives Detonation Tests Confined Areas
94-005	Refinement and Calibration of Simulation Model for the Design of Self-Sealing Underground Stora Chambers
94-006	Analytical Model of Blast in Underground Munit Storage Facilities
94-007	Material Characterizations of Samples from the Linchburg Mine
94-009	Explosive Source Characterization Tests
94-010	Comp-B Charge Characterization
95-001	Hydrological Investigation of the Hop Canyon Area, Socorro County, NM
SL-94-19	Environmental Assessment and FONSI for the Joint United States/Republic of Korea Research and Development Study for Improved Undergrou Ammunition Storage Technologies Tests, Magdal New Mexico

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The EXPLOSIVES SAFETY BULLETIN targets the ammunition/explosives community. It is printed in Savanna, Illinois.

If you wish to submit an article that is of interest to the ammunition/explosives community, please forward it to :Director, U.S. Army Technical Center for Explosives Safety, Attn: SIOAC-ES, Savanna, Il 61074-9639. If you have a request for more copies of the bulletin, please call DSN 585-8771.

DEPARTMENT OF THE ARMY
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SIOAC-ESM

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SITE PLANNING MAPS

Standards require a map at a scale of one inch equals to not more than 400 feet when preparing explosives safety site plan submissions, (1:5000 is a close enough equivalent for installations in locations using metric measurements). This scale is large enough to provide measurable distances, while still allowing relationships between many structures to be displayed.

Some submissions contain maps that don't include a scale making it impossible for reviewers to check or verify distances and sometimes causes delays in processing while apparent inconsistencies are resolved.

To assure you have proper maps for a submission, one of the first stops in the preparation process needs to be a trip to your installation's facilities engineering organization. The facilities planners located there are the best source for maps that you're missing, and they can make sure that you are working with up to date information. They can also show you how your proposed project fits into the installation master plan and make you aware of other planned facilities that you may not know about. They are also the people who should be updating maps to include your proposal so that subsequent reviewers will have confidence in the accuracy of the maps you include.

Finally, you owe it to these planners to close the loop and provide them a copy of the site plan approval. This will allow them to include your project in the installation master plan and make sure that future plans don't encroach on quantity distance (QD) arcs.

by: Mr. Robert Rothenberg,
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HAZARDOUS COMPONENT SAFETY DATA STATEMENTS (HCSDSs)

Historically, the Rock Island Arsenal (RIA) repository, Technical Data and Micrographics Technology Branch, has provided the Department of Defense (DOD) community with new and/or revised HCSDS in aperture card format. In addition, complete listings of the HCSDS file, in both numeric and alphabetic (nomenclature) order, were produced and distributed semi-annually. In today's environment of resource downsizing and in light of direction from higher headquarters to eliminate the use of aperture cards, U.S. Army Industrial Operations Command (IOC) is in the process of changing the method of providing distribution for this safety data.

In FY 96, they hope to have available for customer access an enhanced database from which users will have the option of viewing the data on line and, if necessary, printing the data locally. Queries may be performed on a variety of primary fields and then cross referenced with related information such as part number (PN), national stock number (NSN), etc. As IOC moves into this new automation distribution of safety information, they will take every opportunity to keep users abreast of the changes and aware of new access methods.

Feel free to contact me if you have questions or wish further information related to the Safety data base.

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