



DEPARTMENT OF THE ARMY
HUNTSVILLE CENTER, CORPS OF ENGINEERS
P.O. BOX 1600
HUNTSVILLE, ALABAMA 35807-4301

REPLY TO
ATTENTION OF:

CEHNC-OE-CX

29 OCT 2003

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Revised Risk Assessment Code (RAC) Procedures for Military Munitions Response (MMR), Ordnance and Explosives Center of Expertise (OE-CX), Interim Guidance Document 05-03.

1. PURPOSE: To provide U. S. Army Corps of Engineers (USACE) Districts revised RAC procedures (Enclosure 1) for use when conducting the Preliminary Assessment and Site Inspection (SI) phases to address potential explosives safety hazards related to munitions on Formerly Used Defense Sites (FUDS). This procedure does not address environmental hazards associated with munitions constituents. These procedures supersede the Risk Assessment Procedures for Ordnance and Explosives (OE) sites contained in Appendix B of EP 1110-1-18, 24 April 2000.

2. APPLICABILITY: This guidance is applicable to all USACE commands having responsibility for management and execution of MMR projects.

3. REFERENCES:

a. Management Guidance for the Defense Environmental Restoration Program (DERP), September 2001.

b. Engineer Circular (EC) 200-3-7, DERP FUDS Program Policy.

c. Engineer Regulation (ER) 1110-1-8153, Ordnance and Explosives Response, 14 May 1999.

d. Engineer Pamphlet (EP) 1110-1-18, Ordnance and Explosives Response, 24 April 2000.

4. PROCEDURES:

a. RAC procedures are used by USACE to prioritize MMR actions (explosives safety hazards only) at FUDS based on a RAC

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score. The RAC score is derived from a risk assessment that evaluates two factors, hazard severity and hazard probability.

b. Current USACE guidance requires completion of the RAC during the development of the Preliminary Assessment phase for FUDS. During the SI phase, the RAC is reviewed and if appropriate, revised by the OE-CX Technical Advisory Group.

5. SUMMARY OF CHANGES:

a. Under Part I, Hazard Severity, some entries have been reworded and new additions, along with their values have been inserted. Significant changes include:

(1) Part IA, Type of Ordnance	VALUE
Projectiles, explosive (20 millimeter and higher) (Replaces Medium/large caliber (20 mm and larger))	10
Other Explosive item not previously stated (Added)	10
Practice Ordnance (w/spotting charges, Other than bombs) (Combined/clarified two Entries)	4
Small arms, complete round (.50 cal or less) (Changed from .22 cal - .50 cal)	1
Small arms expended (.50 cal or less) (Added .50 cal or less)	0

(2) Part IB, Pyrotechnics (for munitions not described above):

(a) Value raised from 6 to 10 for munition containing a flame or incendiary material (i.e., Napalm, Triethylaluminum metal incendiaries).

(b) Added: Containers containing WP or other pyrophoric materiel or flame or incendiary materiel, with a value of 6.

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(3) Part IC, Bulk Explosives (HE):

(a) Demolition charges were moved to the secondary explosives category and the value was changed from 6 to 8.

(b) Less sensitive explosives was reworded to: Insensitive explosive substances (explosive contaminated soils, ammonium nitrate).

(4) Part IE, Recovered Chemical Warfare Materiel:

(a) Toxic chemical agents were reworded to reflect Department of the Army language.

(b) Weaponized Industrial Chemicals (Hydrogen Cyanide, AC; Cyanogen Chloride, CD; Phosgene, CG) added with a Value of 10.

(c) War Gas identification Sets were renamed Chemical Agent Identification Sets.

(d) A phone number at the Hazard, Toxic and Radioactive Waste (HTRW) CX for notification when radioactive waste is identified was added to Radiological Materiel.

(e) A requirement to complete Part II of the worksheet when hazard severity value is 0 was included with instructions to proceed to Part III and assign a RAC score of 5 to determine the appropriate action. This change was made because data from Part II is required when re-evaluating RAC 5 determinations.

b. Table 3 of Part II, Hazard Probability, was revised to delete the RAC 5 option when any of the blocks under the severity category are checked with a value of 1 or higher. The RAC 5 score can only be assigned when there is no probability of an explosives hazard.

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6. EFFECTIVE DATES: These procedures are effective immediately and will remain in effect until cancelled or superseded by other policy or regulation. They are currently being incorporated into reference d and the draft ER 200-3-1, Formerly Used Defense Sites Program Policy.

7. If you have any questions or concerns, please contact me at telephone number (256) 895-1540.

FOR THE DIRECTOR OF ORDNANCE
AND EXPLOSIVES DIRECTORATE:



CAROL A. YOUKEY, P.E.
Chief, Center of Expertise
for Ordnance and
Explosives Directorate

Encl

RISK ASSESSMENT PROCEDURES FOR
MILITARY MUNITIONS RESPONSE PROJECTS
(Revised 29 October 2003)

Property Name: _____	Rater's Name: _____
Property Location: _____	Phone Number: _____
DERP Project #: _____	Organization: _____
Property Type: _____	Date Completed: _____
Score: _____	

RISK ASSESSMENT:

This risk assessment (RAC) procedure was developed to address explosives safety hazards related to munitions. This procedure does not address environmental hazards associated with munitions constituents. The U.S. Army Engineering and Support Center, Huntsville (USAESCH), Ordnance and Explosives Directorate (CEHNC-OE) developed this procedure in accordance with MIL-STD 882C and AR 385-10. The Risk Assessment Code (RAC) score will be used by the U.S. Army Corps of Engineers to prioritize the response action(s) at Formerly Used Defense Sites (FUDS). The risk assessment should be based on the best available information resulting from record searches, reports of Explosive Ordnance Disposal (EOD) actions, field observations (site visits), and interviews. This information is used to assess the risk involved based on the potential MMR hazards identified for the project. The risk assessment evaluates two factors, hazard severity and hazard probability.

Part I - Hazard Severity. Hazard severity categories are defined to provide a qualitative measure of the worst credible event resulting from personnel exposure to various types and quantities of unexploded ordnance.

TYPE OF ORDNANCE: (Check all that apply)

A. Conventional ordnance and ammunition:	VALUE
Projectiles, explosive (20 millimeter and larger)	10 <input type="checkbox"/>
Bombs, explosive	10 <input type="checkbox"/>
Grenades, hand or rifle, explosive	10 <input type="checkbox"/>
Landmine, explosive	10 <input type="checkbox"/>
Rockets, guided missile, explosive	10 <input type="checkbox"/>
Other Explosive item not previously stated	10 <input type="checkbox"/>
Bomb, practice (w/spotting charge)	6 <input type="checkbox"/>
Detonators, blasting caps, fuses, boosters, bursters	6 <input type="checkbox"/>
Practice ordnance (w/ spotting charges, other than bombs)	4 <input type="checkbox"/>
Small arms, complete round (.50 cal or less)	1 <input type="checkbox"/>
Small arms, expended (.50 cal or less)	0 <input type="checkbox"/>
Practice ordnance (w/o spotting charges)	0 <input type="checkbox"/>

Conventional ordnance and ammunition (enter largest single value checked) _____

What evidence do you have regarding conventional unexploded ordnance? _____

Property Name:
Project Number:
Property Type:

B. Pyrotechnics (for munitions not described above):

VALUE

Munitions containing White Phosphorus (WP) or other pyrophoric material (i.e., spontaneously flammable) 10

Munitions containing a flame or incendiary material (i.e., Napalm, Triethylaluminum metal incendiaries) 10

Containers containing WP or other pyrophoric material or flame or incendiary material 6

Flares, signals, simulators, screening/burning smokes (other than WP) 4

Pyrotechnics (enter the single largest value checked) _____

What evidence do you have regarding pyrotechnics? _____

C. Bulk Explosives (HE) (not an integral part of conventional ordnance; un-containerized):

VALUE

Primary or initiating explosives (Lead Styphnate, Lead Azide, Nitroglycerin, Mercury Azide, Mercury Fulminate, Tetracene, etc.) 10

Secondary explosives (Demolition charges, PETN, Compositions A, B, C, Tetryl, TNT, RDX, HMX, HBX, Black Powder, etc.) 8

Insensitive explosive substances (explosive contaminated soils, ammonium nitrate) 3

Pyrotechnics (enter the single largest value checked) _____

What evidence do you have regarding bulk explosives? _____

Property Name:
Project Number:
Property Type:

D. Bulk propellants (not an integral part of rockets, guided missiles, or other conventional ordnance; uncontainerized)

Solid or liquid propellants VALUE
6

Bulk Propellants (select 6 or 0) _____

What evidence do you have regarding bulk propellants? _____

E. Recovered Chemical Warfare Materiel (RCWM), Weaponized Industrial Chemicals and Radiological Materiel:

Toxic chemical agents (H-Mustard, G-Nerve, V-Nerve and L-Lewisite) VALUE
25

Chemical Agent Identification Sets 20

Radiological Materiel (If rad waste is identified please call the HTRW-CX at 402-697-2555) 15

Weaponized Industrial Chemicals (Hydrogen Cyanide AC; Cyanogen Chloride, CK; Phosgene, CG) 10

Riot Control Agents (vomiting, tear) 5

Chemical and Radiological (enter the single largest value checked) _____

What evidence do you have regarding chemical or radiological? _____

TOTAL HAZARD SEVERITY VALUE (Sum of value A through E, maximum of 61) _____
Apply this value to Table 1 to determine Hazard Severity Category

Property Name:
Project Number:
Property Type:

TABLE 1
HAZARD SEVERITY*

DESCRIPTION	CATEGORY	HAZARD SEVERITY VALUE
CATASTROPHIC	I <input type="checkbox"/>	21 and/or greater
CRITICAL	II <input type="checkbox"/>	10 to 20
MARGINAL	III <input type="checkbox"/>	5 to 9
NEGLIGIBLE	IV <input type="checkbox"/>	1 to 4
**NONE	V <input type="checkbox"/>	0

*Apply Hazard Severity Category to Table 3 and complete Part II of this form.

**If hazard severity value is 0, complete Part II of this form. Then proceed to Part III and use a RAC score of 5 to determine your appropriate action.

PART II - Hazard Probability. The probability that a hazard has been, or will be, created due to the presence and other rated factors of unexploded ordnance, explosives, incendiary, pyrotechnic, radiological, or RCWM materials on a formerly used Department of Defense (DOD) site.

AREA, EXTENT, ACCESSIBILITY OF OE HAZARD (Check all that apply)

A. Locations of OE hazards:

	VALUE
On the surface	5 <input type="checkbox"/>
Within tanks, pipes, vessels, or other confined areas	4 <input type="checkbox"/>
Inside walls, ceilings, or other building/structure	3 <input type="checkbox"/>
Subsurface	2 <input type="checkbox"/>

Location (enter the single largest value checked) _____

What evidence do you have regarding the location of OE? _____

Property Name:
Project Number:
Property Type:

B. Distance to nearest inhabited location/structure likely to be at risk from OE hazard (road, park, playground, building, etc.).

	VALUE
Less than 1,250 feet	5 <input type="checkbox"/>
1,250 feet to 0.5 mile	4 <input type="checkbox"/>
0.5 mile to 1.0 mile	3 <input type="checkbox"/>
1.0 mile to 2.0 Miles	2 <input type="checkbox"/>
Over 2 miles	1 <input type="checkbox"/>

Distance (enter the single largest value checked) _____

What are the nearest inhabited structures/buildings? _____

C. Number(s) of building(s) within a 2-mile radius measured from the OE hazard area, not the installation boundary.

	VALUE
26 and over	5 <input type="checkbox"/>
16 to 25	4 <input type="checkbox"/>
11 to 16	3 <input type="checkbox"/>
6 to 10	2 <input type="checkbox"/>
1 to 5	1 <input type="checkbox"/>
0	0 <input type="checkbox"/>

Number of buildings (enter the single largest value checked) _____

Narrative: _____

Property Name:
Project Number:
Property Type:

D. Types of Buildings (within 2-mile radius)

	VALUE
Educational, childcare, residential, hospitals, hotels, commercial, shopping centers	5 <input type="checkbox"/>
Industrial, warehouse, etc.	4 <input type="checkbox"/>
Agricultural, forestry, etc.	3 <input type="checkbox"/>
Detention, correctional	2 <input type="checkbox"/>
No buildings	0 <input type="checkbox"/>

Types of buildings (enter the single largest value checked) _____

Describe the types of buildings: _____

E. Accessibility to site refers to access by humans to ordnance and explosives. Use the following guidance:

	VALUE
No barrier nor security system	5 <input type="checkbox"/>
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing	4 <input type="checkbox"/>
A barrier (any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site.	3 <input type="checkbox"/>
Security Guard, but no barrier	2 <input type="checkbox"/>
A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel continuously monitors and controls entry; or, an artificial or natural barrier (e.g., fence combined with a cliff) which completely surrounds the area; and, a means to control entry at all times through the gates or other entrances (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the area).	0 <input type="checkbox"/>

Accessibility (enter the single largest value checked) _____

Describe the site accessibility: _____

Property Name:
Project Number:
Property Type:

F. **Site Dynamics.** This deals with site conditions that are subject to change in the future, but may be stable at the present. Examples would be excessive soil erosion on beaches or streams, increasing land development that could reduce distances from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	5 <input type="checkbox"/>
Not anticipated	0 <input type="checkbox"/>
Site Dynamics (enter the single largest value checked)	_____

Describe the site dynamics: _____

TOTAL HAZARD PROBABILITY VALUE _____
 (Sum of largest values for A through F (maximum of 30). Apply this value to Hazard Probability Table 2 to determine the Hazard Probability Level.

**TABLE 2
HAZARD PROBABILITY***

<u>DESCRIPTION VALUE</u>	<u>LEVEL</u>	<u>HAZARD PROBABILITY</u>
FREQUENT	A <input type="checkbox"/>	27 or greater
PROBABLE	B <input type="checkbox"/>	21 to 26
OCCASIONAL	C <input type="checkbox"/>	15 to 20
REMOTE	D <input type="checkbox"/>	8 to 14
IMPROBABLE	E <input type="checkbox"/>	less than 8

*Apply Hazard Probability Level to Table 3.

Property Name:
 Project Number:
 Property Type:

Part III - Risk Assessment. The risk assessment value for this site is determined using the following Table. Enter the results of the Hazard Probability and Hazard Severity values.

TABLE 3

PROBABILITY LEVEL	FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
SEVERITY CATEGORY:					
CATASTROPHIC I	1 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
CRITICAL II	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	4 <input type="checkbox"/>
MARGINABLE III	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	4 <input type="checkbox"/>	4 <input type="checkbox"/>
NEGLIGIBLE IV	3 <input type="checkbox"/>	4 <input type="checkbox"/>	4 <input type="checkbox"/>	4 <input type="checkbox"/>	4 <input type="checkbox"/>
None (V) = RAC 5 <input type="checkbox"/>					

RISK ASSESSMENT CODE (RAC)

RAC 1-4 Recommend and approve further action as appropriate. Refer to EP 1110-1-18 for discussion of MMR projects and the process to be followed for project execution.

RAC 5 Usually indicates that No DOD Action Indicated (NDAI) is necessary. Recommend and approve NDAI and follow instructions for project closeout in accordance with current program guidance.

PART IV - Narrative. Summarize the documented evidence that supports this risk assessment. If no documented evidence was available, explain all the assumptions that you made.

Property Name:
Project Number:
Property Type: