



UNITED STATES MARINE CORPS  
TRAINING AND EDUCATION COMMAND  
1019 ELLIOT ROAD  
QUANTICO, VIRGINIA 22134

IN REPLY REFER TO:  
3570  
C465

AUG 28 2009

TECOM SAFETY OF USE MEMORANDUM 6-09

Subj: SAFETY OF USE MEMORANDUM (SOUM); IMPLEMENTATION OF THE  
RANGE MANAGERS TOOLKIT (RMTK)

Ref: (a) MARADMIN 612/02  
(b) MCO 3570.1B  
(c) MCO 11000.25  
(d) MCO P3550.10  
(e) MCO P8020.10A  
(f) NAVSEA OP5  
(g) MCO 3550.9  
(h) MCO 3550.12  
(i) MCO 3500.27A

1. Purpose. Per references (a) and (b), this SOUM provides range safety guidance for base, station, and operational commanders regarding the application of tools included in the RMTK.

2. Background

a. Range control facility operations are inherently spatial in nature, and therefore range operations and military training can be relayed and displayed visually through a geographic information system (GIS). GIS enables the operating forces and range control office staffs to maintain accurate situational awareness and a safe and realistic training environment.

b. Per reference (c), geographic information and services are a core capability to support mission requirements for installation management. Sponsored through Headquarters, U.S. Marine Corps (LF), the GEOFidelis enterprise has taken a regional approach providing GIS access, operational control, and maintenance support throughout the Marine Corps. Range and Training Area Management (RTAM) Division, Training and Education Command, has provided resources to the installation range control facilities to assist in the day-to-day management of geographic data and the submission of range and training area (RTA) data to the appropriate GEOFidelis region. The RMTK suite of tools allows the user to interact with this information in a common-map format.

c. RMTK enhances range safety and operations through the application of inter-related tools and technologies that provide a systematic, standardized methodology supporting Marine Corps policies. It also assists range managers and operators in their efforts to modernize ranges, operate range complexes, and manage training lands

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to ensure that operational units are provided quality training while maintaining the highest standards of safety.

d. Per reference (d), the Marine Corps Range and Training Area Management System (MCRTAMS), located at <https://rtam.tecom.usmc.mil>, contains the institutional database of GIS information for all Marine Corps RTAs. RMTK tools are available for download in MCRTAMS and can be found at <https://rtam.tecom.usmc.mil/rm/safety> under the Range Managers Tool Kit tab. MCRTAMS hosts two of the web-enabled tools, the Surface Danger Zone (SDZ) Tool and the Explosives Training Range (ETR) Tool. In addition, the Range Facility Management Support System (RFMSS), used for range scheduling and management, is available through the MCRTAMS website.

e. The other RMTK tools require ARCGIS software to operate. They must be used on "standalone" computers at the range control facility as ARCGIS is not currently supportable, except via Citrix application, by the Navy-Marine Corps Internet (NMCI) network. Base/station range personnel should coordinate with RTAM Division representatives to obtain the appropriate license for the software. RTAM Division support is available at [tecomrtamsupport@usmc.mil](mailto:tecomrtamsupport@usmc.mil).

3. Specifications and Safety Considerations. The following is a listing of RTA requirements/hazards and the RMTK tools designed to support/mitigate them on operational training ranges:

a. *Explosives Training Range (ETR) Tool*

(1) *Who uses it?* Explosives danger zones will be developed by the operational training unit using the ETR Tool and submitted to the range control facility with the range request either electronically via RFMSS or as a hard copy.

(2) *What is its use?* The ETR Tool supports breaching operations and explosives training by generating associated explosives danger zones. The ETR Tool automates the creation of explosives danger zones in accordance with references (b), (e), and (f). It provides a quick and accurate method to evaluate the blast and fragmentation pattern of an explosives training event. The ETR Tool will be used to produce explosives danger zones for single or multiple DODICs.

(3) *Where can it be found?* The tool can be accessed either over the web from MCRTAMS, <https://rtam.tecom.usmc.mil/rm/safety>, or from the standalone version. Requests for software licenses and RTAM Division support should be submitted at [tecomrtamsupport@usmc.mil](mailto:tecomrtamsupport@usmc.mil).

(4) *When is it used?* This tool is used in breaching operations, explosives training, or explosive ordnance disposal personnel training on explosives training ranges. The ETR Tool will

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also be used for the certification of explosives training ranges per reference (g).

b. *Operational Range Clearance Tool (RCT)*

(1) *Who uses it?* Range managers will ensure all ordnance (both air and ground) expended on an operational training range is tracked through RFMSS. This information will be loaded into the RCT as a basis for determining unsafe or detrimental loading conditions on ranges per reference (h).

(2) *What is its use?* The RCT is designed to enhance the safety and sustainability of operational training ranges through the management and accountability of accumulated unexploded ordnance (UXO), and munitions, target, and other range-related debris.

(3) *Where can it be found?* The RCT can be accessed from standalone computers in the range control facility. Requests for software licenses and RTAM Division support should be submitted at [tecomrtamsupport@usmc.mil](mailto:tecomrtamsupport@usmc.mil).

(4) *When is it used?* This tool is used during range clearance planning to estimate UXO and range debris loading. This information may also be used in the preparation of range clearance project submissions to RTAM as contained within reference (h).

c. *Surface Danger Zone (SDZ) Tool*

(1) *Who uses it?* SDZs are developed by the operating forces and other range users. Range control personnel will use the standalone SDZ tool to generate SDZs to be submitted with deviation recommendations.

(2) *What is its use?* SDZs define the ground and airspace designated within the training complex (to include associated safety areas) for vertical and lateral containment of projectiles, fragments, debris, and components resulting from the firing, launching, or detonation of weapon systems. The SDZ Tool generates worst case scenario (deterministic) SDZs in accordance with parameters defined in reference (b).

(3) *Where can it be found?* SDZs may be developed on the web by using the MCRTAMS website, <https://rtam.tecom.usmc.mil/rm/safety>, the standalone version in the range control facility, or drawn manually. Requests for software licenses and RTAM Division support should be submitted at [tecomrtamsupport@usmc.mil](mailto:tecomrtamsupport@usmc.mil).

(4) *When is it used?* It is used in preparation for live-fire ground-to-ground and ground-to-air exercises on operational training ranges. The SDZ Tool will also be used to certify ranges per reference (g).

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d. *Weapon Danger Zone (WDZ) Tool*

(1) *Who uses it?* WDZs may be generated by the using unit and submitted to the range control facility for approval via either RFMSS or hard copy. Range control personnel will be responsible for developing WDZs for all fixed targets associated with training range requests.

(2) *What is its use?* WDZs identify the minimum area necessary to contain munitions and hazardous fragments within the installation or range boundary that result from air-to-ground ordnance delivery operations.

(a) WDZs for fixed wing, rotary wing, and unmanned aircraft systems will be generated using the WDZ Tool. The tool will determine aircraft type, ordnance, and delivery parameters that are permissible for each target. A record (electronic or hard copy) of the analysis of each target engaged during the training evolution will be maintained at range control. The WDZ Tool manager/library function may be used to meet this requirement.

(b) Range control personnel will publish air-to-ground ordnance delivery regulations for each target in the range standard operating procedures (SOP) specifying ordnance permitted as well as any restrictions (dive angle, airspeed, run-in heading) associated with that target and specific training event. Proper target analysis will include, but is not limited to, the following:

1. Approved ordnance for the range/target
2. Type of deliveries allowed
3. Run-in restriction if required for a specific weapon or delivery
4. Approved range containment boundary (with deviation if required)
5. Weather minimums if more restrictive than standard visual flight rules operating requirements
6. Any other constraints or restrictions required to allow weapons delivery of the identified target

For deliveries not contained within the SOP, the using unit may submit proposed WDZs to the range control office for consideration.

(c) WDZs will be based on a 99.999% level of containment and must be kept wholly within the installation boundary, or range boundary when the range is not located on the installation. While containment levels on the WDZ Tool are adjustable from 1:10,000 to a 1:1,000,000 probability of munitions (for inert ordnance) or a hazardous fragment

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(for live ordnance) escaping the containment area, 1:1,000,000 is the range safety standard. If the selected containment level is less than 1:1,000,000, an appropriate risk analysis and deviation process must be completed per references (b) and (i). Similarly, a risk analysis and deviation process must be completed if the target's proximity to the installation boundary causes the WDZ to extend beyond that boundary. Deviations approved for WDZs extending beyond installation boundaries must be based on the ability to contain projectiles, hazardous fragments, laser beams, and both vertical and horizontal ricochets sufficiently within the installation boundaries, and areas under military control (e.g., leased land or training areas and facilities acquired through Memorandum of Understanding or Memorandum of Agreement). Probability of hazardous fragment escapement must not present a greater hazard than 1:1,000,000 (unlikely) to the public.

(d) The WDZ Tool risk analysis function can show the probability of impacts within a selectable, defined area of the WDZ. This function will help define the risk associated with a specific location within the WDZ, dependent upon the weapons system employed and the size of the area at risk. This area at risk, or area of critical concern, might involve the placement of participating personnel (e.g., JTAC or TACP) or the location of towers or other facilities within the WDZ. Given the range safety standard of 1:1,000,000, the commander must not accept greater risk for this area (less than 1:1,000,000) until a thorough risk assessment has been completed per reference (i). Risk may be mitigated by moving the location of the personnel, decreasing their vulnerability through the use of terrain features or bunkers, or reducing the dimensions of the area. Non-participating personnel must be outside the WDZ at all times.

(3) *Where can it be found?* The WDZ Tool may be downloaded via the MCRTAMS website, <https://rtam.tecom.usmc.mil/rm/safety>, or the standalone computers in the range control office. Requests for software licenses and other RTAM Division support should be submitted at [tecomrtamsupport@usmc.mil](mailto:tecomrtamsupport@usmc.mil).

(4) *When is it used?* This tool will be used whenever air-to-ground delivery of ordnance is planned on operational training ranges.

e. *Noise Tool*

(1) *Who uses it?* Range managers will use the Noise Tool.

(2) *What is its use?* The Noise Tool allows range managers to place noise contours in the context of other map layers to gain a better situational awareness of their range complex and the action necessary to mitigate potential noise complaints. The RMTK Noise Tool accounts for local conditions when evaluating the likelihood of receiving noise complaints due to weapons firing and explosives detonation. Noise levels are based on decibel (dB) peak and have an associated risk of complaint and recommended action per level. If a noise contour has implications for crossing the installation boundary, the range control officer may mitigate the noise contour by de-conflicting with time by delaying the

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training until conditions change. It is designed as a RTA management tool, not a National Environmental Policy Act (NEPA) noise compliance tool, due to the difference between range and NEPA noise measurement requirements.

(3) *Where can it be found?* The Noise Tool may be downloaded via the MCRTAMS website, <https://rtam.tecom.usmc.mil/rm/safety>, or the standalone computers in the range control facility. Requests for software licenses and other RTAM Division support should be submitted at [tecomrtamsupport@usmc.mil](mailto:tecomrtamsupport@usmc.mil).

(4) *When is it used?* The tool is used when training exercises on operational ranges may cause noise that generates complaints from on and off-base residents and business owners.

f. *On Range Ammunition Handling (ORAH) Tool*

(1) *Who uses it?* Range control personnel will develop the explosives danger zones using the ORAH Tool in coordination with the operating unit; these will then become a part of the range request.

(2) *What is its use?* The ORAH Tool automates the creation of explosives danger zones and assists with planning considerations per references (b), (e), and (f). It provides a quick and accurate method to evaluate the explosive potential of ammunition temporarily stored on operational training ranges in total support of live-fire training events, to include the compatibility of different types of munitions. The ORAH Tool is used to ensure that the inhabited-building distance of the munitions used in support of the training mission remain within the installation/range boundary.

(3) *Where can it be found?* The ORAH Tool may be downloaded via the MCRTAMS website, <https://rtam.tecom.usmc.mil/rm/safety>, or on standalone computers in range control facilities. Requests for software licenses and RTAM Division support should be submitted at [tecomrtamsupport@usmc.mil](mailto:tecomrtamsupport@usmc.mil).

(4) *When is it used?* The ORAH Tool should be used to produce explosives danger zones for single or multiple DODICs when the munitions to be stored are in total support of the training mission.

g. *Training Events Planning System (TEPS) Tool*

(1) *Who uses it?* Range control facility personnel use the TEPS Tool.

(2) *What is its use?* The TEPS Tool provides the ability to view a common range picture within a three-dimensional (3D) environment with a specific time/date stamp. The tool automates the 3D display of any danger zone generated by the tools within the RMTK. It provides range control personnel the ability to de-conflict air, land, and sea space. In addition, it affords a quick and accurate method to visually display

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the vertical hazards associated with training events on Marine Corps installations.

(3) *Where can it be found?* The TEPS Tool may be downloaded via the MCRTAMS website, <https://rtam.tecom.usmc.mil/rm/safety>, or standalone computers at the range control facility. The ARCGIS 3D extension is needed to run this tool. The TEPS Tool output for air space mitigation along flight paths is only valid when the time/date setting is accurate. Requests for software licenses and other RTAM Division support should be submitted at [tecomrtamsupport@usmc.mil](mailto:tecomrtamsupport@usmc.mil).

(4) *When is it used?* The TEPS Tool is used when range operators require 3D situational awareness of the entire range complex.

#### 4. Responsibilities

a. The installation commander is ultimately responsible for the safety of all training conducted aboard the installation.

b. Commanders will ensure range control facilities have sufficient GIS data, computer hardware, software, and Internet capability to operate and support the RMTK.

c. RTAM Division will provide RMTK and GIS training to range professionals in support of all Marine Corps RTAs.

5. Applicability. This SOUM is applicable to the Total Force.

6. Cancellation. This SOUM will remain in effect until it is canceled or updated.

7. Points of Contact. RTAM points of contact for the various RMTK Tools are listed below:

Head, Range Safety Branch: Mr. E. R. Sobieranski (703)784-4480 (DSN 278).

Deputy Head, Range Safety Branch: Mr. C. N. Hathcock (703)784-2841 (DSN 278).



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