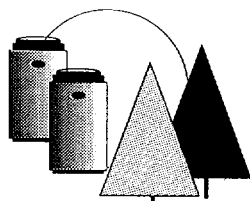


72-22



Private Fuel Storage, L.L.C.

P.O. Box C4010, La Crosse, WI 54602-4010

Phone 303-741-7009 Fax: 303-741-7806

John L. Donnell, P.E., Project Director

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

April 18, 2000

COMMITMENT RESOLUTION LETTER #32
DOCKET NO. 72-22 / TAC NO. L22462
PRIVATE FUEL STORAGE FACILITY
PRIVATE FUEL STORAGE L.L.C.

Reference: 1. PFS Letter, Donnell to U.S. Nuclear Regulatory Commission, Commitment Resolution Letter #22, dated November 19, 1999

In Reference 1, PFS agreed to provide the NRC Staff information on the use of the Army's Multiple Launch Rocket System (MLRS) on Dugway upon receiving and analyzing responses to Freedom of Information Act requests filed by PFS with the Army. PFS has received information from the Army relating to the use of MLRS on Dugway. PFS encloses its assessment of the hazard posed to the Private Fuel Storage Facility (PFSF) from the use of MLRS on Dugway, based on this and other information obtained by PFS. As set forth in the enclosure, the use of MLRS on Dugway would pose no credible hazard to the PFSF.

If you have any questions regarding this response, please contact me at 303-741-7009.

Sincerely,

A handwritten signature in cursive script that reads "John L. Donnell".

John L. Donnell
Project Director
Private Fuel Storage L.L.C.

Enclosure

NM5501
public

cc:

Mark Delligatti

John Parkyn

Jay Silberg

Sherwin Turk

Asadul Chowdhury

Greg Zimmerman

Scott Northard

Denise Chancellor

Richard E. Condit

John Paul Kennedy

Joro Walker

Assessment of the Hazard Posed to the Private Fuel Storage Facility by the Use of the Army Multiple Launch Rocket System on Dugway Proving Ground

PFS has assessed the risk to the Private Fuel Storage Facility (PFSF) by the use of the Army's Multiple Launch Rocket System (MLRS) on Dugway Proving Ground. It has determined, as discussed below, that because of the great distance between the PFSF and the firing and impact locations for the MLRS on Dugway, the use of MLRS would not pose a credible hazard to the PFSF. The assessment first provides a general overview and description of the MLRS followed by a discussion of its use on Dugway.

Overview and Description of MLRS

The MLRS is an artillery rocket launcher mounted on a tracked vehicle chassis. It carries a pod of 12 rockets that can be fired to a maximum range of 32 km. The minimum range for the rockets is 5 km. The region that is potentially placed at risk by the firing of MLRS is depicted in Army Field Manual 6-60, "Tactics, Techniques, and Procedures for MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) OPERATIONS." The Manual identifies regions to the front and rear of the launcher. The region at risk to the front of the firing point, i.e., toward the target or aim point, is defined by 1) the area around the aim point large enough to include all debris from the rocket and to contain the rocket if the fuse fails to function and 2) the exclusion area, which is the region between the firing point and the closest edge of the area around the aim point that would contain the rocket debris. See FM 60-6, Appendix J, at 4-9 (attached as Tab A). The M28 training rocket is the only type of MLRS rocket that has been fired at Dugway.¹ The M28 has the same ballistic properties as the M26 rocket that would be fired from the MLRS in combat, but instead of the warhead of the M26, the M28 contains a spotting charge of three smoke canisters. For the M28, the region at risk extends no more than 4 km beyond the aim point (at longer firing ranges) and no more than 3.2 km to either side of the aim point (also at longer firing ranges). FM 60-6, App. J at 4-5.

MLRS rockets are designed not to deviate significantly from the direction in which they are fired. The rocket follows a ballistic, free-flight (i.e., unguided) trajectory to the target. Thus, the rocket has no guidance system and hence there is no potential for a guidance system malfunction to cause deviation from the direction in which the rocket was fired. The propulsion for each rocket is provided by an identical solid fuel rocket motor, so the rocket range (distance from the launcher to the impact point) is governed by the angle of elevation at which the rocket is fired. The rocket is initially stabilized by spin imparted through spin rails mounted on the inner wall of the rocket launch tube. After the rocket leaves the launch tube, four fins on the rocket deploy to maintain its spin. The fins are mounted on the aft end of the rocket and are held down by wire rope retaining straps when the rocket is in the tube. As the rocket moves forward in the launch tube, lanyard devices trigger a delayed strap-cutting charge. After the rocket leaves

¹ Electronic mail from Teresa Shinton, Freedom of Information Officer, Dugway Proving Ground (Jan. 12, 2000); Electronic mail from Teresa Shinton, Freedom of Information Officer, Dugway Proving Ground (Jan. 20, 2000). It is Army policy to issue only training rockets for peacetime training use. Conversation with Lt. Gen. Bob Moore, USA (Ret.) (Dec. 3, 1999).

the tube, the charge cuts the straps and the fins unfold and lock in position. The M28 training rocket launch pod container also has an additional fin release device to ensure the deployment of the rocket fins and further reduce the likelihood that a rocket would deviate from the direction in which it was fired. FM 60-6, Chap. 1 at 8.

According to FM 60-6, there are only two areas of danger to the rear of the MLRS firing point. One area is the Launcher Danger Area, which is the area to the rear of the launcher that is exposed to blast and debris. This area extends 400 m to the rear of the firing point. The other hazard area to the rear of the firing point is the Noise Hazard Area, which is the area to the rear of the launcher that can only be occupied by mission essential personnel wearing double hearing protection. This area extends an additional 500 m to the rear of the firing point (for a total hazard area extending 900 m behind the firing point). FM 60-6, App. J at 7.

MLRS Use on Dugway

In the past 12 years, the MLRS has been fired only twice on Dugway Proving Ground—once in 1988 and once in 1995.² The Dugway Proving Ground, Ranges and Training Areas Regulation identifies three impact area for training on Dugway into which the MLRS could conceivably be fired: the White Sage Impact Area, the Wig Mountain Impact Area, and the Causeway Impact Area.³ See Tab B. In 1988, 36 M28 training rockets were fired into the Causeway Impact Area,⁴ which, as shown in the map at Tab C, is nearly 60 km southwest of the PFSF.⁵ Some of these rockets were fired from the vicinity of Wig Mountain, which is roughly 27 km west-southwest of the PFSF. The other rockets fired into the Causeway Impact Area were fired from other, unknown locations on Dugway. The firings into the Causeway Impact Area would pose no hazard to the PFSF. The range of the MLRS is only 32 km. Therefore, in order to hit the Causeway Impact Area, 60 km southwest of the PFSF, the firing location of the MLRS could be no closer than 28 km from the PFSF (60 km – 32 km = 28 km). Moreover, in such a case, the firing direction would have to be to the southwest, directly away from the PFSF, i.e., the PFSF would be 28 km directly behind the launcher. As FM 6-60 indicates, firing MLRS at a distant target would pose no danger whatsoever to a location 28 km behind the firing point.

If MLRS were fired into the Causeway Impact area on an azimuth toward the PFSF (i.e., from the opposite side of the impact area), the launcher would be over 60 km from the PFSF and hence would pose no hazard to the facility by virtue of being out of range.

² Electronic mail from Teresa Shinton, Freedom of Information Officer, Dugway Proving Ground (Jan. 12, 2000).

³ Dugway Proving Ground Regulations, DPGR 350-2 (January 7, 1999), at 6-1. All artillery projectiles fired at Dugway must be aimed to fall within established impact areas. *Id.* at 8-2. Also, surface danger areas for weapons (which encompass the effects of weapons use) are not permitted to cross or intersect Dugway boundaries. *Id.* at 4-1 to 4-2. Dugway regulations require personnel firing weapons to be certified for safety and they strictly control weapon firing points, firing directions, intervening activities, and impact areas to ensure that firing is safe. *Id.* Chapters 1, 6, 8. See Tab B.

⁴ 2nd Lt. Michael J. Norton, USA, memorandum to Commander, Dugway Proving Ground (August 3, 1988).

⁵ The areas on the map at Tab C marked “Target Grids” are not impact areas in use on Dugway; they are old target areas that may contain unexploded ordnance or other hazardous materials.

In 1995, an unknown number of MLRS M28 training rockets were fired from the vicinity of Granite Peak, on Dugway, into the Wig Mountain Impact Area.⁶ The 1995 firing points, aim points, and range safety area (derived from FM 6-60) are indicated on the map at Tab C. The firing points were located approximately 50 km southwest of the PFSF and the aim points were located approximately 33 km west-southwest of the PFSF. The firings into the Wig Mountain Impact Area from these firing points would pose no hazard to the PFSF in that they are approximately 50 km from the PFSF, well beyond the 32 km maximum range of the MLRS rocket (as indicated on the map).

Nor would any hazard be posed to the PFSF assuming that MLRS rockets might in the future be fired into the Wig Mountain Impact Area from different locations on Dugway. First, the firing points on Dugway (shown on the map at the end of Tab B) that are within range (32 km) of the PFSF are located such that MLRS rockets being fired into the Wig Mountain Impact Area from those points would be aimed away from the PFSF. Thus, for the reasons discussed above, MLRS rockets fired from these points would not pose a hazard to the PFSF. Second, even if one were to assume that MLRS rockets could be fired into the Wig Mountain Impact Area in a direction from the southwest to the northeast, on an azimuth toward the PFSF (i.e., from the opposite side of the impact area),⁷ such would still pose no hazard to the facility given the distance of the impact area from the PFSF. The boundary of the Wig Mountain Impact Area closest to the PFSF is 27 km away. As stated above, the minimum range of the MLRS is 5 km. Given that aim points are not to be located at the very edge of the impact area (because account must be taken of the potential for rockets to fall within a region around the aim point as indicated above), any MLRS aim point would be located inside the impact area – not on the boundary edge – and therefore more than 27 km from the PFSF. That combined with the 5 km minimum range of the rocket would put the MLRS launcher for any possible MLRS firing scenario on an azimuth toward the PFSF more than 32 km from the facility, and thus out of range, even assuming that the MLRS aim points were located as close as allowable to the Wig Mountain Impact Area boundary closest to the PFSF.

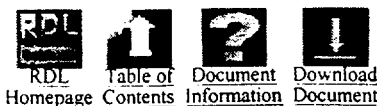
In the last 12 years, no MLRS rockets have been fired into the White Sage Impact Area. Moreover, that impact area is located in the southeast corner of Dugway, the boundary of which is over 30 km south-southwest of the PFSF at its closest point. See Maps at end of Tab B and at Tab C. Thus, even if MLRS rockets were to be fired into the area in the future, they would have to be fired nearly directly away from the PFSF and hence they would not pose a hazard to the facility.

Conclusion

In conclusion, MLRS firing on Dugway Proving Ground would pose no credible hazard to the PFSF. Because of the great distance between the PFSF and the firing and impact areas on Dugway and the fact that the MLRS rockets are designed not to deviate significantly from the direction in which they are fired, an MLRS rocket fired on Dugway would not strike the PFSF.

⁶ Lt. Col. Gaylen G. Whatcott, response to Freedom of Information Act request (December 20, 1999).

⁷ The map at the end of Tab B shows no firing points being located at any such locations.



APPENDIX J

SAFETY

Safety is always a prime consideration of soldiers and trainers at all levels, especially when training exercises use live ammunition. Often, the implementation of safety procedures becomes counterproductive, preventing units from conducting realistic live-fire training. Units must be able to conduct realistic training using live or training ammunition while meeting all safety requirements. The procedures in this chapter are based on the principles of artillery safety in AR 385-63 and cover peacetime safety practices and procedures for MLRS firing. Units following these procedures can conduct safe, effective live-fire training exercises.

Section I

RESPONSIBILITIES AND PROCEDURES

Responsibilities

AR 385-63, Chapter 11, implements the chain-of-command safety concept. Under this concept, the firing battery chain of command is responsible for safety during firing in both training and combat. This chapter reinforces AR 385-63, however, if local range regulations are more restrictive than the material in this chapter, the local range regulations must be followed.

Range Control/Installation Range Officer

The installation range officer provides to the officer in charge (OIC) a range safety card. This card states the location coordinates of the launcher firing area and the location coordinates of the target(s) to be engaged. The range officer also identifies any special instructions that must be followed in firing at that range (road guards, time constraints, Air Force overflights, and so on). He is responsible for constructing and verifying surface danger zones for MLRS firing areas. He prepares and maintains all waivers IAW AR 385-63. All waivers must be approved by a general officer at the installation command level.

Commanders of Field Artillery Units

Commanders establish and maintain a safety training and certification program for their unit personnel. The purpose of this program is to train and qualify individual members of the firing battery in the safety procedures for their specific areas of responsibility. When the responsible commander is satisfied that the individual members are qualified to perform the safety duties as required in the firing battery, he certifies them as competent to perform those duties. The FA battalion commander is responsible for safety during all phases of a firing exercise under his control. He selects, trains, and certifies the personnel necessary to help him discharge this responsibility.

These personnel include, but are not limited to, the firing battery commander, battery operations officer, firing platoon leader, fire direction computers, and launcher section chiefs. If any position is not filled by a command safety-certified person, another person who is certified and qualified to fill that position performs the safety checks.

Officer in Charge

The OIC is the battery commander or his command safety-certified direct representative. The OIC is responsible for all aspects of safety in the firing unit and on the assigned firing range. Before the firing exercise, the range control officer provides the OIC the required safety data and any firing limitations. The OIC verifies that the unit is in the proper firing position. He supervises the conversion of the safety data into a safety diagram and ensures that this diagram is verified by another command safety-certified person. The OIC is responsible for ascertaining locations of friendly personnel who may inadvertently become exposed to artillery fires through the installation range safety officer. He ensures dissemination of this information to platoon leaders, platoon sergeants, and chiefs of section, as appropriate, so they are aware of potential situations which might result in fratricide.

Firing Platoon Leader

The firing platoon leader is responsible for the safety practices of the firing element. He ensures that section chiefs report firing data to the POC/BOC. He ensures that the launcher danger area is clear.

Platoon Sergeant

The platoon sergeant assists the platoon leader in his duties. He must be prepared to perform any of the platoon leader's duties in his absence.

Section Chief

The launcher section chief is responsible for the operation of his crew from the reload point through rocket launch(es). He ensures that all procedures in the launcher are conducted in accordance with applicable technical manuals and that all reports and checks are verified in accordance with the procedures outlined in this chapter. He is ultimately responsible for ensuring munitions are neither armed nor fired until firing data is properly verified as safe. Specific duties of the section chief are contained in subsequent paragraphs.

Procedures

The MLRS launcher FCS is designed to perform many repetitive self-tests during operations. Built into both the launcher hardware and software, these tests check and continually monitor the launcher throughout its operation. Additional manual checks should focus on crew-error, the area which has caused most launcher-related firing incidents. Checks which verify all data input into the FDS and launcher FCS eliminate most of the causes of firing incidents.

MLRS firing data (azimuth, quadrant elevation, and fuze setting) are computed by the FCS. The FCS conducts internal tests, all of which must be within system accuracy tolerances, before allowing the launcher to fire. To complete a firing sequence, the LLM must be oriented and maintain accuracy within ± 3 mils of the FCS ballistic solution (CMD vs actual data displayed on the FCP). If for any reason the launcher drive system (LDS) fails, (part wear, adverse mechanical failure, etc.) preventing the LLM from reaching or maintaining its computed ballistic firing window, the FCS will cancel the fire mission and not allow the crew to fire the rockets. Additionally, during the conduct of every fire mission, the FCS further verifies its LLM position by comparing its data against a mechanical reference provided by azimuth and angle position transducers. These transducers are fitted to the

rotating band of the launcher turret and the launcher elevation actuator. A failure of agreement between the FCS and its mechanical resolvers will alert the crew through a warning message. Any indication of a system error (BIT light or prompt on the FCP) will cause the crew to immediately abort the mission in progress and troubleshoot the fault before continuing.

Operator error is minimized through verification of launcher firing data. This verification must be made by a safety certified individual. The independence of this check is maintained in one of two ways:

- By ensuring data input is by two different methods for the firing and check launchers (i.e., manual entry vs data transmission) when conducting static firings. This includes meteorological data, update and target grid coordinates, altitudes and grid zones. It also consists of a comparison of the command firing data from a calibrated launcher FCS (firing launcher) and computed data from an independent launcher (non-firing).
- By ensuring data input is observed by two safety certified personnel (e.g., gunner and section chief for the FCS; fire direction computer and operations officer for the FDS). It also includes a check by both the gunner and section chief of the actual firing data to ensure it falls within the safety "T" when conducting live fire exercises using the safety computations in Section II.

Additionally, the PADS-established SCP must always be verified. A hard copy of the data is sent via a location status message to the BOC and POC, where it is validated and retained. The BOC and POC file this information for historical record. In the BOC and POC, the operations officer (BOC) and platoon leader (POC) verify that the met data and impact area target location were correctly entered by the FDS operator and transmitted digitally to the firing launcher(s), where the data are automatically entered into the FCS. This independent verification of start-up data by the launcher section chief and the platoon leader ensures that accurate position data are used during fire mission computation. The gunner ensures, and the section chief verifies, that start-up and update data are properly entered into the launcher FCS.

The tolerances within which the launcher can accurately position and fire during practice firings are identical to those used in a tactical situation. This enhances tactical realism during training and validates the system capability. Procedures for firing safety involve a properly calibrated launcher, verification that the FCS is functioning properly, and verified launcher firing position within a designated firing area. Strict adherence to the operator's manual procedures and/or warning indicators and a hard copy of the launcher firing ballistic solution sent via a MFR to the BOC and POC for historical record are required.

Use of observers located near and properly oriented on the impact area to observe a warhead event (M28) or safe impact (M28A1) for safety verification depends on local installation range SOP. If spotting of the warhead is required, visual observers or radar tracking (AN/TPQ-37) may be used. A sample MLRS firing safety checklist is provided at the end of this Appendix.

Section II

COMPUTATION OF SAFETY DATA (M28 and M28A1 Training Rockets)

Units using these procedures must be thoroughly familiar with the applicable terms and basic safety computations for each of the training rockets (M28 and M28A1) contained in AR 385-63. These procedures incorporate the procedures for developing the surface danger zones (SDZs) contained in that regulation. They apply the SDZ requirements around an installation impact area rather than a specific target. They also apply the launcher danger areas to either individual firing points or a larger

firing OPAREA. In the event of a conflict, AR 385-63 has precedence. The examples described herein are based on the M28A1 Training Rocket (reduced range).

General

There are three methods to compute safety data for MLRS live-firing. The first of these is for point-to-point firings using the SDZ diagrams contained in AR 385-63 and the safety checklist at the end of this appendix. The other two methods allow the unit to develop a safety "T" for either a firing point or a firing OPAREA. Both of these latter methods apply all of the SDZ requirements established in AR 385-63.

The first method allows the unit to derive a safety "T" for a single firing point firing into a "target selection box." The second method requires a larger impact area, but allows the unit to derive a single safety "T" for an entire launcher OPAREA firing into a target selection box. Both of these latter methods allow the unit to conduct more realistic and tactically driven live-fire exercises, thus significantly enhancing training.

OPAREA safety works well when conducting live-fire exercises with the M28A1 Training Rocket (reduced range). Although these procedures can be used with the standard M28 Training Rocket, its much larger values for W, X, and Y (see *Definition of Terms*) necessitate exceptionally large installation impact areas (see Tables J-1 and J-2). Inordinately small impact areas may preclude the use of these procedures with the M28A1 Training Rocket (reduced range) as well.

Table J-1. M28 Safety Values

	RANGE TO TARGET (m)	W	X	Y
M 2 8	10,000 to 11,500	1,160	8,000 + H	2,200
	11,501 to 15,000	1,320	6,300 + H	2,200
	15,001 to 20,000	1,620	5,000 + H	2,200
	20,001 to 23,000	1,820	3,200 + H	2,200
	23,001 to 27,000	2,220	3,600 + H	2,200
	27,001 to Maximum	3,220	4,000 + H/2	2,200

Table J-2. M28A1 Safety Values

	RANGE TO TARGET	W	X	Y
M 2 8 A 1	8,000 to 9,000	560	2,450	1,930
	9,001 to 10,000	620	2,100	1,500
	10,001 to 11,000	685	1,800	1,180
	11,001 to 12,000	760	1,560	900
	12,001 to 13,000	850	1,475	600
	13,001 to 14,000	950	1,580	450
	14,001 to 15,000	1,050	1,780	350

Safety computations for each of these methods are completed in four phases. *Phase I* is the application of the SDZ requirements (for the specific munition) to the installation impact area. *Phase II* is the derivation of the firing limits in both azimuth (AZ) and quadrant elevation (QE). *Phase III* is the application of the SDZ requirements (for the specific munition) to the launcher firing point or OPAREA. *Phase IV* is the completion of the flight corridor.

Definition of Terms

- AoF** Azimuth of Fire.
- H** Height of the launcher above mean sea level.
- W** A distance to either side of the target wide enough to include all debris (payload, warhead skin, and rocket motor) from normally functioning rounds.
- W_{max}** The maximum possible value of W. For OPAREAs, this is the value of W at a range from the rear edge of the OPAREA to the target (maximum range).
- X** A distance beyond the target adequate to contain rockets when the fuze fails to function.
- X_{max}** The maximum possible value of X. For OPAREAs, this is the value of X at a range from the forward edge of the OPAREA to the target (minimum range).
- Y** A distance short of the target sufficient to include all debris (payload, warhead skin, and rocket motor) from normally functioning rounds.
- Y_{max}** The maximum possible value of Y. For OPAREAs, this is the value of Y at a range from the forward edge of the OPAREA to the target (minimum range).

Note: When firing the standard M28 training rocket, 320 meters has already been added to the value of W (to account for Area A), 1,300 meters has already been added to the value of X (to account for Area B), and Y will always equal 2,200 meters. W and X values for the M28A1 training rocket by definition include areas A and B respectively.

Firing Point Method

Phase I

Apply the SDZ requirements to the installation impact area:

STEP 1. Outline the usable portion of the installation impact area. Index the approximate geographic center of this area (target).

STEP 2. Index the firing point.

STEP 3. Draw a line segment connecting the two indices from steps 1 and 2.

STEP 4. Apply the values of W_{max} , X_{max} , and Y_{max} to the edges of the installation impact area (toward the target). These values should be based on ranges from the firing point to the near edge (minimum range) and far edge (maximum range) of the installation impact area. This is the *SDZ Impact Area*.

Phase II

Determine the Left and Right Azimuth Limits.

STEP 1. Draw line segments from the firing point to the right and left edges of the SDZ Impact Area which will keep all rounds within the SDZ Impact Area (safety fan). You must also apply any azimuth restrictions imposed by the installation safety office for the firing area. (See Figure J-1.)

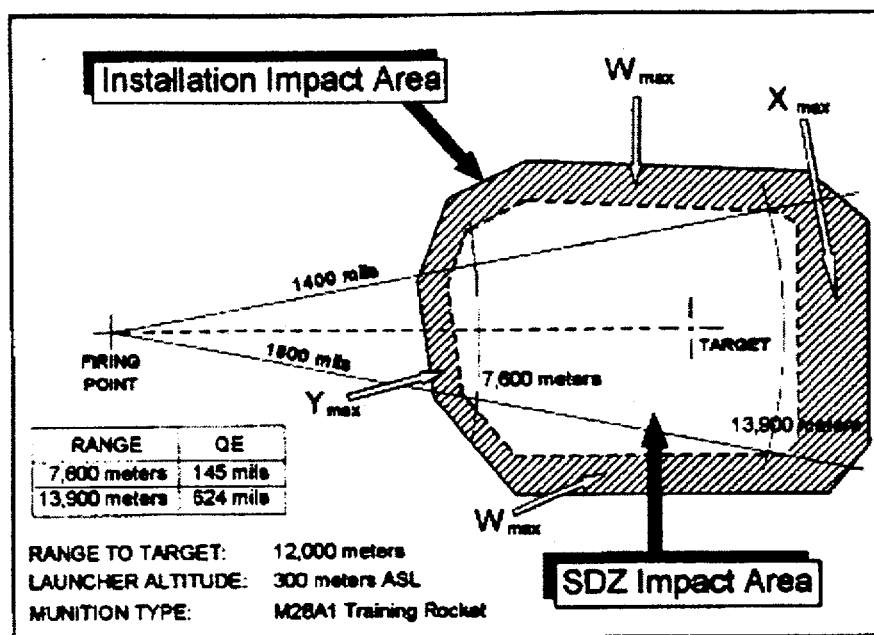


Figure J-1. Left and right azimuth limits.

Derive the Minimum and Maximum Values for Quadrant Elevation (QE).

STEP 2. Measure the minimum and maximum ranges to the near and far edges of the SDZ impact area (within the azimuth limits). You must also consider min and max range limits imposed by the range safety office. Using the current MET message, determine the associated firing azimuths and QEs with a launcher FCS by dry firing missions at the lower left and upper right corners. The lower left mission will determine the left azimuth limit and min QE. The upper right mission will determine the right limit and max QE. This completes the safety "T" for firing point method (see Figure J-2).

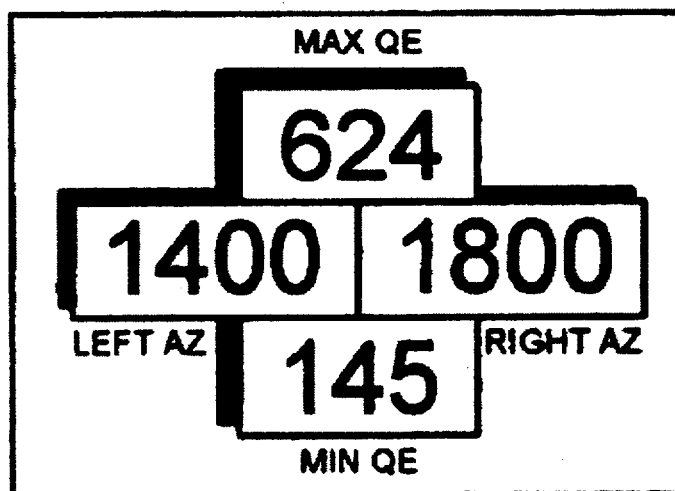


Figure J-2. Safety T.

Phase III

Complete the Launcher Danger Areas.

STEP 1. *Area F* (Launcher Danger Area) is the area immediately to the rear of the launcher which is directly exposed to blast and debris. It extends 350 meters to the left and right of the launcher firing point (perpendicular to the AoF) and 400 meters to the rear of the firing point (parallel to the AoF). Personnel are prohibited from occupying this area.

STEP 2. *The Noise Hazard Area (NHA)* extends behind Area F. It can only be occupied by mission essential personnel wearing double hearing protection. Draw a box that extends beyond Area F an additional 300 meters (500 meters for the M28 rocket) to the rear of the firing point (Figure J-3).

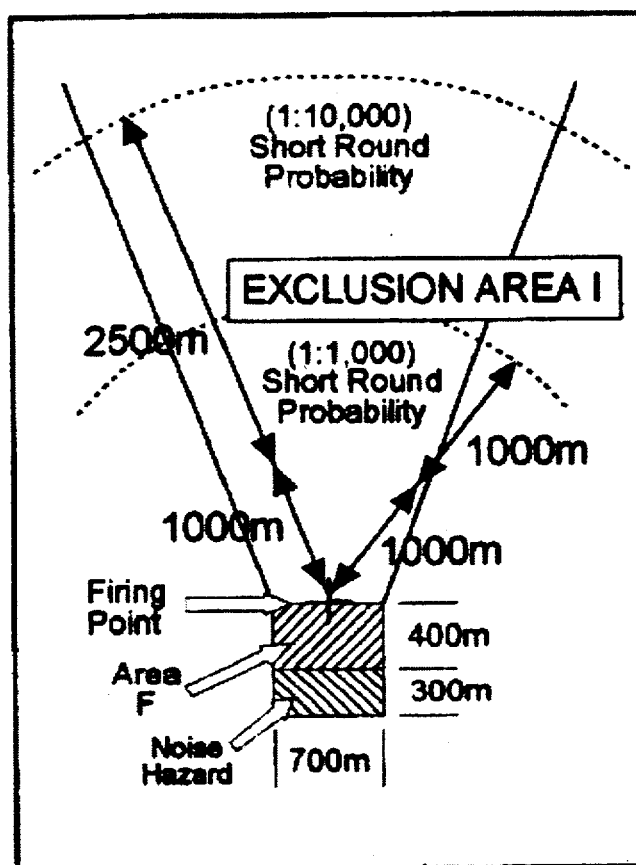


Figure J-3. Noise hazard area.

Phase IV

Complete the Flight Corridor

STEP 1. Construct line segments from the left and right forward edge of Area F to the left and right near edge of the Installation Impact Area respectively that are parallel to the left and right azimuth limits (see Figure J-4).

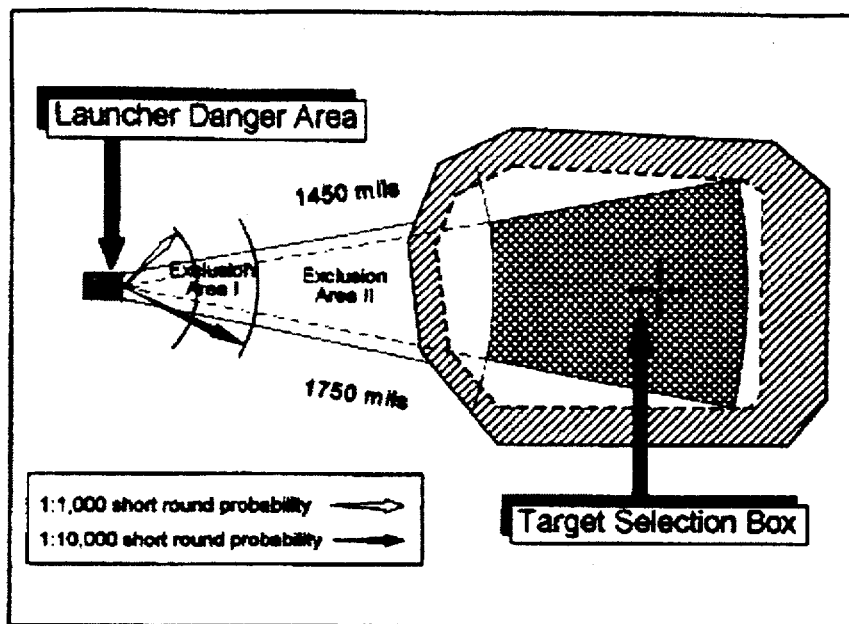


Figure J-4. Flight corridor.

STEP 2. The *Exclusion Area* is that area of the SDZ flight corridor within a specified distance of the downrange edge of the firing area. It is endangered by failure of the rocket motor (or early warhead event for the M28 rocket) during the boost phase. The distance is based on acceptance of risk (approved by the installation commander IAW AR 385-63).

Exclusion Area I

STEP 2a. Construct an arc, centered on the firing point, with a radius derived from Table J-3 (based on the level of accepted risk for Exclusion Area I). The area between the arc and the firing point is Exclusion Area I.

Table J-3. Exclusion Areas

SHORT ROUND PROBABILITY	EXCLUSION AREA I		EXCLUSION AREA II		EXCLUSION AREA III	
	M28	M28A1	M28	M28A1	M28	M28A1
1 per 1,000 Firings	1,000 m	1,000 m	See Note 1	See Note 2	1,800 m (Note 3)	N/A
1 per 10,000 Firings	4,700 m	2,500 m	See Note 1	See Note 2	1,800 m (Note 3)	N/A
Notes: ¹ This distance will vary based on range to target and the size of the impact area. It is the area between Exclusion Area I and Exclusion Area III. ² This distance will vary based on range to target and the size of the impact area. It is the area between Exclusion Area I and the SDZ impact area. ³ This distance is measured from the near edge of the SDZ impact area toward the firing point.						

Note: The use of a 1:1,000 or 1:10,000 short round probability is used when calculating risk under waiver IAW AR 385-63.

Exclusion Area II

STEP 2b. The area between the arc of Exclusion Area I and the forward edge of the SDZ Impact Area is Exclusion Area II for the M28A1 Training Rocket (reduced range). Exclusion Area II for the M28 Training Rocket is that area between Exclusion Areas I and III.

Note: Exclusion Area II can only be occupied under waiver IAW AR 385-63. Exclusion Area I and III cannot be occupied.

Exclusion Area III

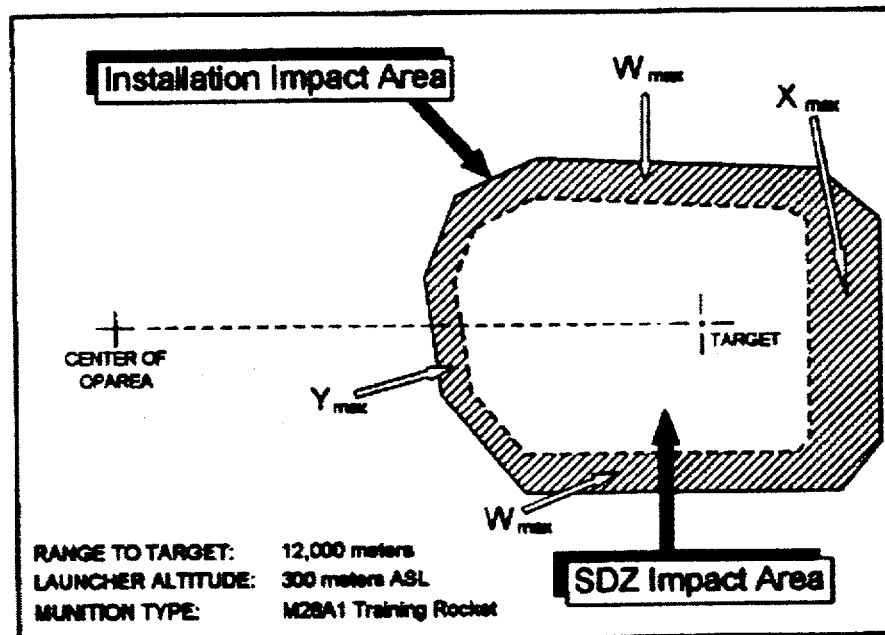
STEP 2c. This *Exclusion Area* applies only to the M26 Tactical and M28 Training Rockets. It is the area within the flight corridor that begins at the near edge of the SDZ impact area and extends 1,800 m toward the firing point.

The AZ and range limits determined in Phase I also describe a small area around the target. This is the target selection box. All targets selected from within this box will fall within the safety "T" for the firing point.

OPAREA Method

Phase I

Apply the SDZ requirements to the installation impact area (see Figure J-5):



STEP 1. Index the approximate geographic center of the installation impact area (target).

STEP 2. Index the center of the proposed firing OPAREA. Draw a circle around the index with a one kilometer radius. This distance may be larger or smaller depending upon the training area available to the unit.

STEP 3. Draw a line segment connecting the two indices from steps 1 and 2.

STEP 4. Apply the values of W_{\max} , X_{\max} , and Y_{\max} to the edges of the installation impact area (toward target). This is the *SDZ Impact Area*.

Phase II

Determine the Left and Right Azimuth Limits of the OPAREA.

STEP 1. Mark the most forward rearward, right, and left positions along the circumference of the OPAREA circle from Phase I.

STEP 2. Draw a safety fan from both the left and right positions (from step 1) which will keep all rounds within the SDZ Impact Area. You must also apply any azimuth restrictions imposed by the installation safety office for the firing area. Measure the left and right limits of each fan (see Figure J-6). These are the initial left and right azimuth limits for the entire live-fire OPAREA. (You will determine the final azimuth limits with FCS in step 8.)

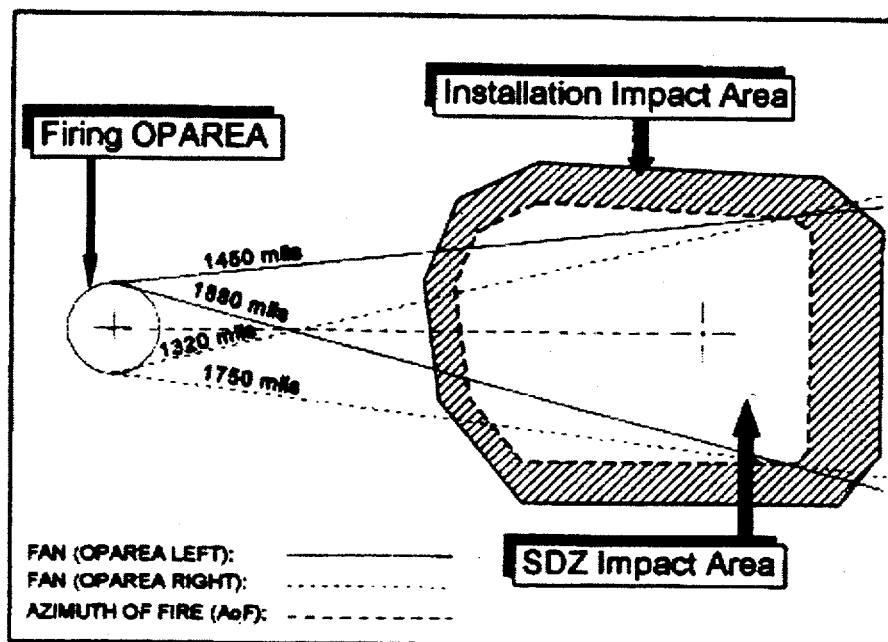
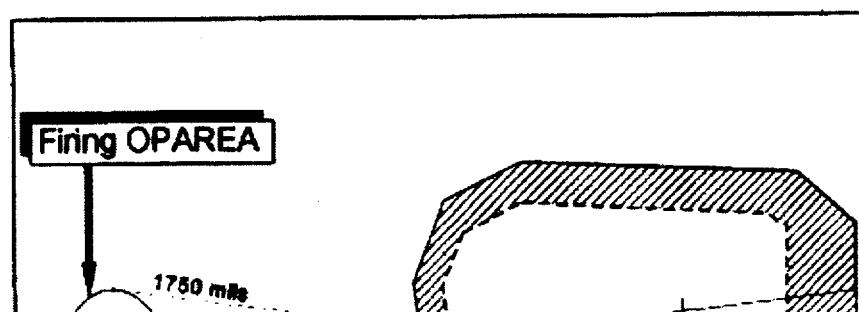


Figure J-6. Azimuth limits for OPAREA.

STEP 3. Apply the lower (or leftmost) value of the *left* azimuth limits (derived from the leftmost position) to the rightmost position. Apply the higher (or rightmost) value of the *right* azimuth limits (derived from the rightmost position) to the leftmost position. Ensure these limits are marked separately and distinctly from the previous fans. They will be used to complete a "target selection box" later (see Figure J-7).



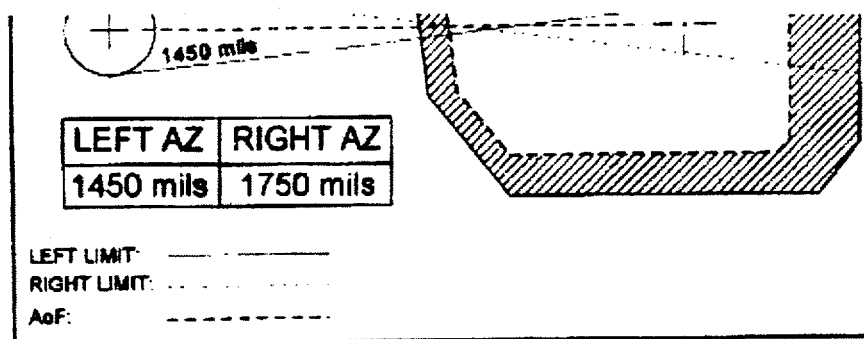


Figure J-7. Azimuth limits calculations.

Derive the Minimum and Maximum Values for Quadrant Elevation (QE).

STEP 4. Measure the minimum and maximum ranges (2 each) from both the forward and rear OPAREA positions to the near and far edges of the SDZ impact area (within the azimuth limits). You must also consider minimum and maximum range limits imposed by the installation range safety office (Figure J-8).

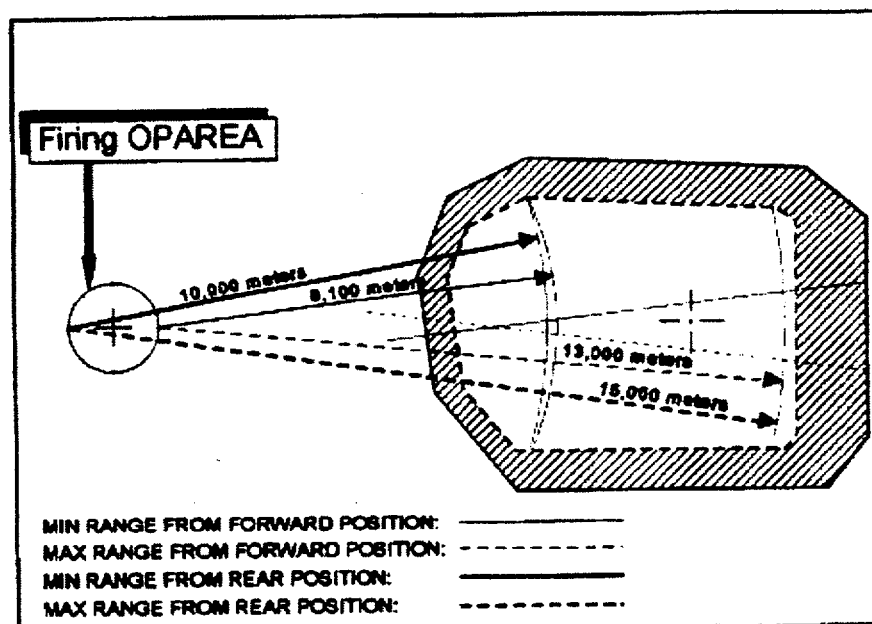
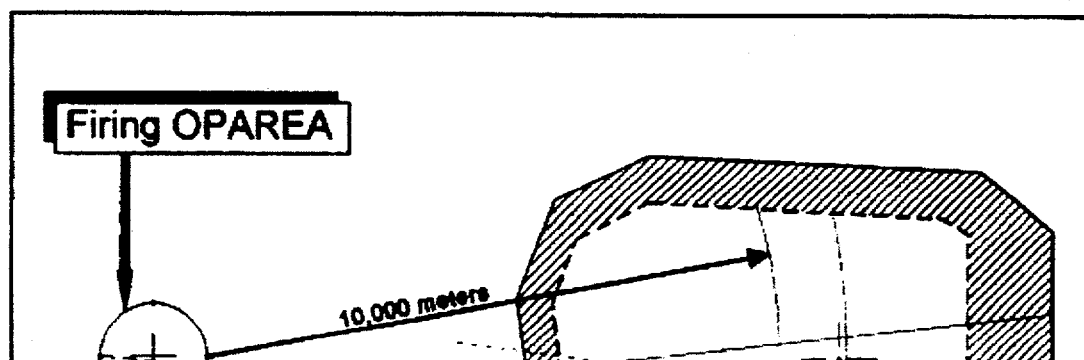


Figure J-8. Range limits calculations.

STEP 5. Derive the OPAREA minimum range by applying the minimum range from the rear position of the OPAREA to the forward position of the OPAREA (Figure J-9).



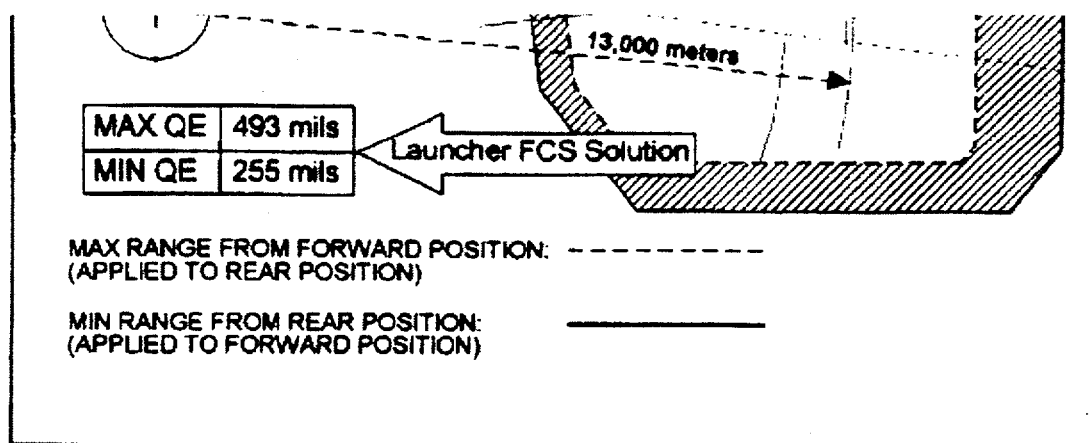


Figure J-9. Quadrant elevation limits.

STEP 6. Derive the OPAREA maximum range by applying the maximum range from the forward position of the OPAREA to the rear position of the OPAREA (Figure J-9).

STEP 7. Draw the associated range arcs, intersecting both the left and right azimuth limits from step 3.

STEP 8. Compute the safety T using the FCS with the current met to fire four dry missions from left, right, front, and rear OPAREA extremes as listed below.

Mission 1. Forward most OPAREA position to the lower left corner. This yields the min QE.

Mission 2. Rearward most OPAREA to the upper left corner. This yields the max QE.

Mission 3. Left most OPAREA to the lower right. This yields the right azimuth limit.

Mission 4. Right most OPAREA to the lower left corner. This yields the left azimuth limit.

This completes the safety "T" that establishes firing limits for the launcher within the OPAREA (Figure J-10).

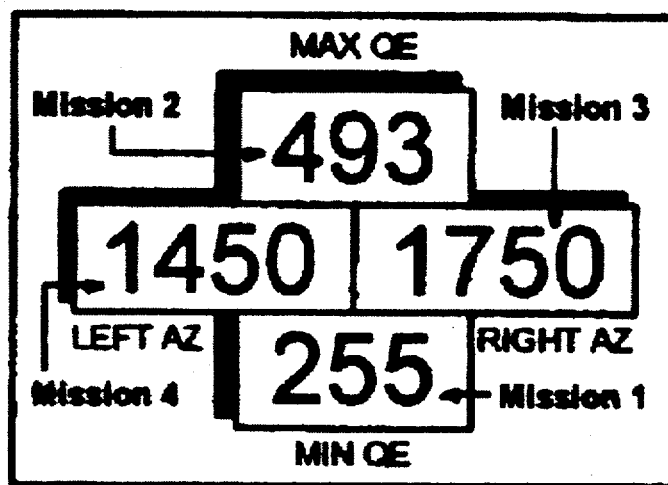


Figure J-10. Safety T.

Phase III

Apply the SDZ requirements (for the specific munition) to the launcher OPAREA and complete the flight corridor.

This phase applies the Launcher Danger Area (Area F) and Noise Hazard Area requirements to the OPAREA to determine a "worst case" diagram. This is accomplished by applying those requirements around the rear half of the circumference of the OPAREA (Figure J-11). Although these actual danger areas are a function of the specific launcher location, controlling entry to the areas derived in this phase will allow more freedom of movement for the launcher, thus adding realism to the live-fire training exercise.

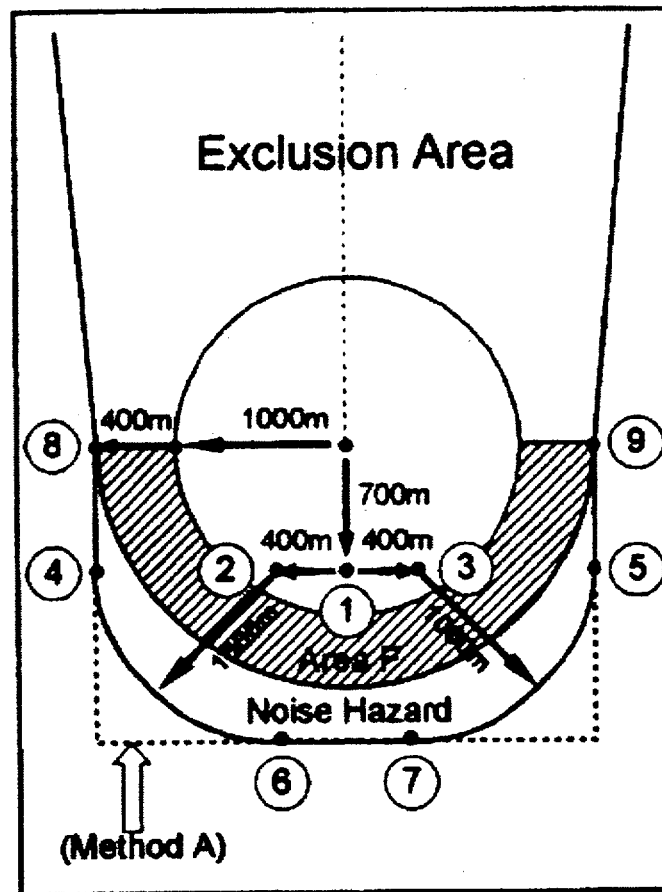


Figure J-11. OPAREA SDZ requirements.

STEP 1. *Area F* (Launcher Danger Area) is the area immediately to the rear of the launcher which is directly exposed to blast and debris. Divide the OPAREA in half by drawing a line through its center, perpendicular to the AZ to the target constructed in Phase I. Extend outward along this line to a point 400 meters on each side around the rear half of the OPAREA. (See the shaded area of Figure J-11).

STEP 2. *The Noise Hazard Area (NHA)* extends an additional 300 meters behind Area F. It can only be occupied by mission essential personnel wearing hearing protection. There are two means of constructing the NHA. The first is the most simple, while the second method minimizes the size of the NHA thus allowing less use of training land. To construct the OPAREA NHA:

Method A:

STEP 2a. Draw a box that extends 1400 meters to the left and right, as well as 1700 meters to the rear, of the center of the firing OPAREA. The result is a box 2800 meters wide and 1700 meters deep. Go to Phase IV.

Method B:

STEP 2b. Place an index at a point 700 meters to the rear of the center of the OPAREA along the AoF (see Figure J-11, point number 1).

STEP 3b. Place two more indices 400 meters to the left and right of the first index, perpendicular to the AoF (points 2 and 3).

STEP 4b. From each of these last two indices, construct a 1000 meter radius arc through points 4 and 5 respectively (1600 mils).

STEP 5b. From points 4 and 5 extend line segments forward so that they are tangent to Area F at points 8 and 9 respectively.

STEP 6b. Connect the two arcs in the rear (between points 6 and 7) with a line segment to complete the rear edge of the NHA.

Phase IV

STEP 1. Construct line segments from points 8 and 9 forward to the near edge of the Installation Impact Area. The line segments should be parallel to the left and right azimuth limits respectively. Since these line segments begin at points 400 m to the left and right of the OPAREA, Danger Area A (320m) has been accounted for. This describes the general flight corridor (see Figure J-12).

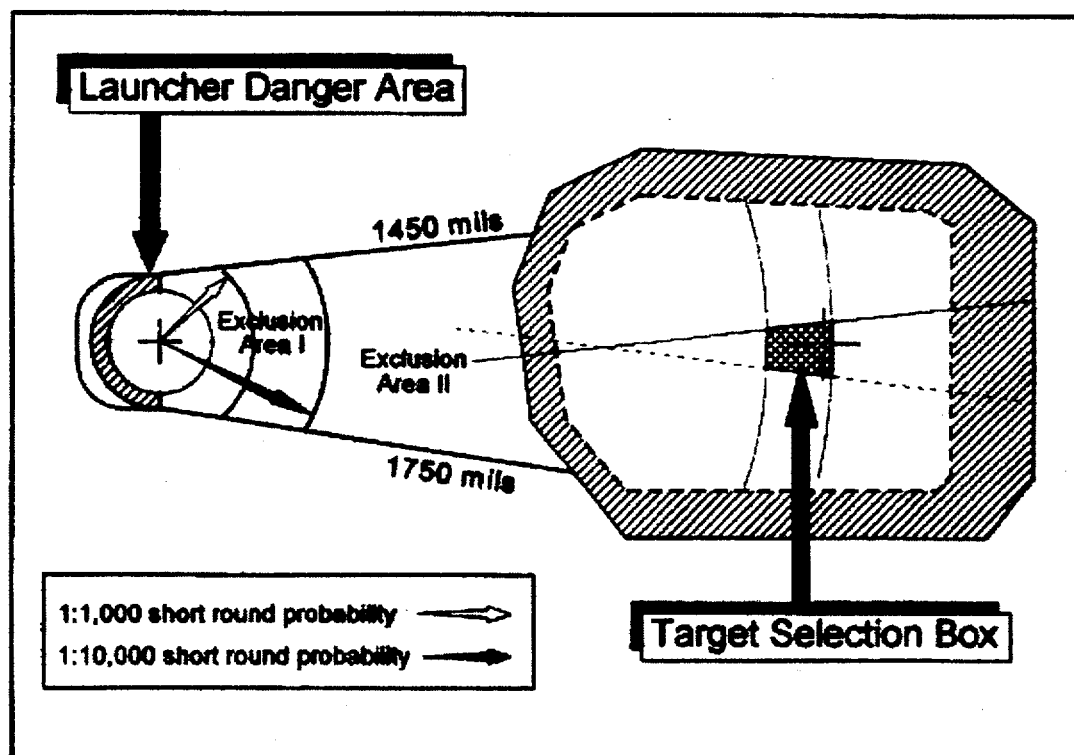
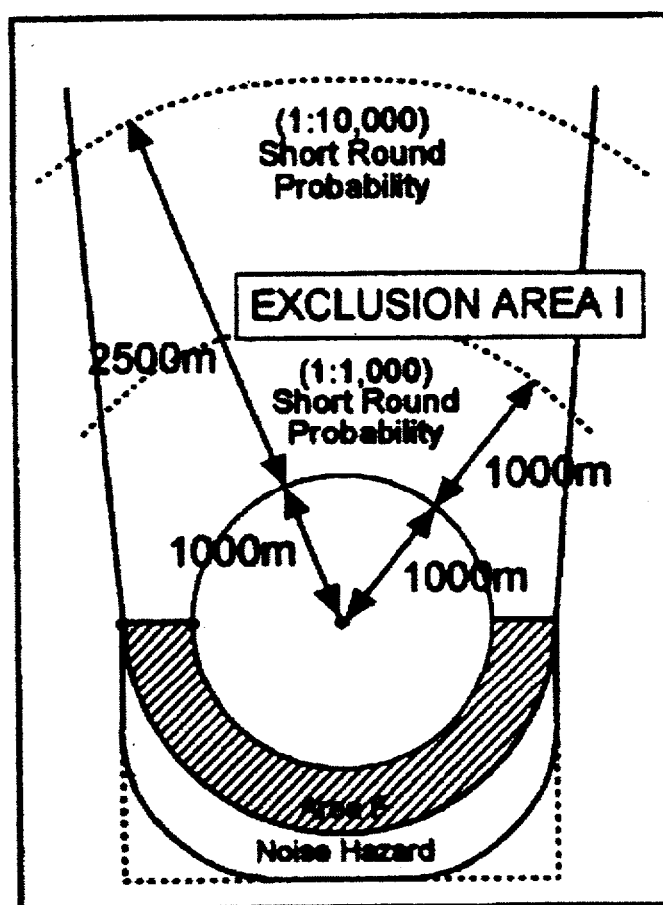


Figure J-12. Exclusion areas.

STEP 2. The *Exclusion Area* is that area of the SDZ flight corridor within a specified distance of the far edge of the firing area. It is endangered by failure of the rocket motor during the boost phase. The distance is based on acceptance of risk (approved by the installation commander IAW AR 385-63).

Exclusion Area I

STEP 2a. Construct an arc, from the center of the OPAREA, with a radius that extends beyond the OPAREA by the distance in Table J-3 (based on the level of accepted risk for Exclusion Area I). The area between the arc and the front of the OPAREA is Exclusion Area I. The example in Figure J-13, shows both a 1:10,000 short round probability (2,500 m) and a 1:1,000 short round probability (1,000 m). The use of a 1:1,000 level of acceptable risk must be done under waiver IAW AR 385-63.

**Figure J-13. Exclusion Area I.**

Exclusion Area II

STEP 2b. The area between the arc of Exclusion Area I and the front of the OPAREA is Exclusion Area II for the M28A1 Training Rocket (reduced range). Exclusion Area II for the M28 Training Rocket is that area between Exclusion Areas I and III. Exclusion Area II can only be occupied under waiver IAW AR 385-63. Exclusion Area I and III cannot be occupied.

Exclusion Area III

STEP 2c. This *Exclusion Area* applies only to the M26 Tactical and M28 Training Rockets. It is the

area within the flight corridor that begins at the near edge of the SDZ impact area and extends 1,800 m toward the firing point.

The AZ and range limits determined in steps 3 and 6 of Phase II also describe a small area around the target. This is the target selection box. All targets selected from within this box will fall within the safety "T" for the live-fire OPAREA (Figure J-12).

DUGWAY PROVING GROUND

DPGR 350-2

7 JANUARY 1997

RANGES AND TRAINING AREAS



RANGE AND TRAINING AREA REGULATION

CHAPTER 1

GENERAL

1-1. **PURPOSE:** To prescribe policy and procedures governing control and safe operation of training ranges and maneuver areas at Dugway Proving Ground (DPG), and to implement policies contained in applicable Army regulations and other directives.

1-2. **APPLICABILITY:** This regulation applies to all military units, organizations and other authorized individuals and agencies that use training ranges and maneuver areas on this installation. Any training or non-test activities are required to comply with this regulation.

1-3. **GENERAL POLICIES:** DPG contains Test and Evaluation (T&A) Test Grids, test facilities, training areas (TAs), ranges, and facilities for use by Dugway West Desert Test Center for developmental testing of Smokes and Obscurants, Chemical/Biological simulants, and artillery testing. All non test specific training areas and ranges may be made available for Active and Reserve Force units, Reserve Officer Training Corps (ROTC) units/activities, civilian law enforcement organizations/agencies, and other authorized civilian organizations, subject to the following priorities (see 4-11):

- a. Research and Development Testing.
- b. Military training activities as described in para 4-11.
- c. Civilian organizations. Authorized civilian organizations are authorized use of Pistol Range, when available, provided their requests are screened, cleared, and approved by the Chief of Plans and Operations Division (PO) and Safety Office (SA). Additionally, the group must comply with the provisions of this regulation and AR 920-20, Sections II and IV. Civilian organizations using ranges will provide their own material and supplies to include target frames.
- d. Small Arm Ranges will be scheduled for organizations. Ranges will not be issued for individual use.
- e. Camping in Cedar Mountain Training Area. Camping at Camp Tumbleweed is permitted only if there is no conflict with training. The campsite must be left in as good or better ecological condition than it was prior to occupation. Youth organizations are authorized the use of Camp Tumbleweed provided their requests are approved through P&O; the group has sufficient adult supervision, and complies with all provisions of this regulation.
- f. Military organizations must ensure that all personnel are in proper uniform. Tenant activities and training units must conduct training exercises in tactical field uniform. As a minimum, this includes steel/kevlar helmet and LBE. This policy applies to all training facilities and ranges.

1-4. **RESPONSIBILITIES:** All users of DPG Training Facilities and Ranges must be familiar with this regulation as it is the basis for control of training facilities, ranges, maneuver areas, airspace, and for resolution of conflicts for training activities.

1-5. **OFFICER IN CHARGE and RANGE SAFETY OFFICER REQUIREMENTS:** Officers-In Charge (OICs) and Range Safety Officers (RSOs) must be Safety Certified and qualified in the training to be conducted (See

Chapter 7).

1-6. MEDICAL REQUIREMENTS:

a. Military training on any DPG live-fire range requires the presence of school trained medical personnel, 91A/B/C; a dedicated evacuation vehicle and a driver who knows the route to the United States Army Health Clinic (USAHC), DPG. Nonmilitary range or facility users must request military medical support or certify the presence of EMT certified personnel with appropriate equipment.

b. At least two certified EMT personnel with appropriate trauma supplies and equipment and a trauma vehicle must be present during training for the following events or sites:

(1). Live fire tactical maneuver courses and other special firing sites designated by the Range Control Officer (RCO).

(2). Drop zones when used for personnel drops on DPG and drop zones off post for DPG supported personnel.

c. At least one MOS qualified medic, MOS 91A/B/C, with aid bag and a dedicated military evacuation vehicle, with litter and driver, must be present during training at ranges or firing points where high explosive ammunition is being used. This includes, but is not limited to all mortar and field artillery firing points and other special firing sites designated by the RCO.

d. Range Control will notify the USAHC if the need arises for emergency ambulance or medical support.

e. Medical support from DPG for range use is very limited and must be funded by the using unit.

f. All accidents/injuries requiring medical treatment and/or evacuation must be reported to Range Control.

g. Units training at DPG must have medical personnel trained in the first aid procedures for chemical agent casualties (see Appendix K).

1-7. MEDEVAC (DUST OFF):

a. Should an injury or medical emergency occur on a range, the OIC or RSO will call a check-fire, ensure that first aid is begun, and inform Range Control. Control of weapons and ammunition must not be lost during emergency response.

b. If DPG medical personnel are present, they will make the decision, within the parameters established by the Director, Health Services, whether MEDEVAC is indicated or not. They will so inform the OIC or RSO, who will contact Range Control.

c. If the nature of the emergency indicated that a life, sight, or limb threatening emergency exists and medical personnel are not present, the OIC will request MEDEVAC as follows:

(1). Call Range Control on FM 36.10 or telephone 5141.

(2). Inform Range Control that a MEDEVAC is needed. Include the following:

- (a). Name of person making request.
- (b). Site name/grid coordinates.
- (c). Number of patients and nature of injury.
- (d). Unit frequency and call sign, if additional unit FM radios are on site.
- (e). Hazards to aircraft in the vicinity.
- (f). Method of marking the landing zone (smoke, panel, strobe, etc.).

(3). The person recommending MEDEVAC will not break contact with Range Control until released by Range Control.

(4). Range Control will notify the DPG Health Clinic that MEDEVAC is needed and will inform the requesting individual of the status of the MEDEVAC response. The DPG Health Clinic will/will not request MEDEVAC based on the attending physician's analysis of the medical situation.

(5). MEDEVAC frequencies will be initiated on FM 36.10 or VHF 131-10. MEDEVAC will then be moved to frequency being used.

d. If Range Control cannot be contacted, the OIC may make a direct request thru the Dugway Medical Team stationed at the live fire site. If a Dugway Medical Team is not present, then the OIC should call directly to the Dugway Medical Clinic, telephone 2222 or 2211.

e. OICs must keep in mind that weather at DPG occasionally makes MEDEVAC unavailable, and therefore should not delay ground evacuation to health clinic if conditions for helicopter flight are marginal. Should MEDEVAC be unable to respond, DPG Health clinic will transport patient via ambulance to appropriate area hospital.

f. The scene of any injury or property damage accident must be preserved by unit personnel pending investigation by a DPG Investigation Team, the unit commander, and, for accidents involving damage to material greater than \$200,000, or a fatality, by a team from the U.S. Army Safety Center at Fort Rucker.

1-8. PERSONNEL SAFETY CERTIFICATION:

a. All live-fire and non firing facility OICs and RSOs must meet requirements outlined in Chapter 4, AR 385-63 and be safety certified. Additional mortar and artillery certification requirements are described in Chapter 8.

b. Certification is accomplished as follows:

(1). The OIC/RSO candidate must read this regulation, with special emphasis on those portions pertaining to range operations. Additional safety restrictions may be directed by subordinate commanders, but will conform to the provisions of this regulation and its references. Unit commanders will ensure that officers and noncommissioned officers detailed as Range Officers/NCO and Safety Officers/NCO are thoroughly qualified.

(2). The unit conducts a program of instruction on the duties of OIC and RSO, and ensures that the candidates are qualified and knowledgeable in the weapons or events involved. All personnel concerned will

become thoroughly familiar with pertinent technical and field manuals regarding care, handling, and safety precautions of the particular weapon and ammunition being fired.

(3). The unit provides a memorandum of certificate of OIC/RSO qualification to P&O and Range Control.

c. Range safety certification is for a period of six months. Personnel involved in accidents or incidents will be suspended from certification during incident investigation.

d. OIC/RSO candidates must receive a Range Briefing from the RCO or Range Control at the time units come to Dugway.

1-9. COMMUNICATIONS:

a. During any live fire exercise, loss of communication with Range Control requires an immediate cease-fire until communication is reestablished.

b. Ground units conducting training anywhere on the DPG Range Complex must have at least two operational means of communication with Range Control and/or Security. Combinations of radios and telephones meet this requirement. Range Controls FM radio frequencies are, 36.10/36.70 in event of emergency. Arrangements for users with no radio communication can be made with P&O or Range Control. Units having their own radio network will be required to provide Range Control with a base station and must comply with paragraph c below. Air units must be able to communicate with DPG Range Control (FM36.10, VHF 131.1, UHF 242-4) and Michael Army Airfield (MAAF) (FM 41-50, VHF 126.2, UHF 241-0).

c. The above radio frequencies are reserved as DPG Installation Range Safety nets. Units with these frequencies in their CEOI must establish and use alternates. All radio frequencies used at DPG must be cleared through MT-TD-I (Instrumentation Office) DSN 789-5412 or (801) 831-5412. Under no circumstances may unit business be conducted on DPG standard Range Control nets.

d. Organizations which plan to conduct operations on DPG must possess adequate communications capability. DPG has minimal communications capability. If, in the opinion of Chief of Plans and Operations, adequate communications capability cannot be obtained, the organization will not be permitted to use Dugway Proving Ground. Contact P&O Range Scheduling Officer for guidance/assistance.

1-10. HELMETS AND HEARING PROTECTION: Military protective headgear must be worn on all live-fire maneuver ranges, all ranges with overhead fire, all ranges or firing points where high explosive ammunition is fired, and during parachute jumps. Helmets may be required on other sites at the commander's discretion. Hearing protection is required on all firing ranges and all other locations where noise levels produced by equipment is excessive (exceeds 85db).

1-11. ALCOHOLIC BEVERAGES: Alcoholic beverages are prohibited on all ranges, training facilities, and training areas.

1-12. AUTHORIZED USE: All parts of the range and training area complex are off limits, day and night, to all units and all personnel, military or civilian, without approved scheduling or use permit. Reconnaissance by military personnel for future training is authorized, but must not interfere with ongoing training, and must be scheduled.

1-13. UNIT CONSTRUCTION: Unit plans for construction of barriers, emplacements or other structures must be noted on Range Request during scheduling. All construction will require a record of environmental consideration

and all digging requires a preapproved excavation permit and/or waiver from Division of Installation Services (DIS). All construction on, or addition to, fixed ranges and facilities must be approved by P&O through DIS.

1-14. PRIVATELY OWNED VEHICLES (POVs): Privately owned vehicles are prohibited on the ranges, on non-firing training facilities, and in training areas. Government vehicles must be outside cantonment areas.

1-15. PUBLIC AFFAIRS (PA):

- a. The Commander, DPG, is the approving authority for all media visits and tours to DPG.
- b. PAO will evaluate all community requests to use on-post facilities. All such requests will be forwarded to PA, where they will be screened for propriety and conformity with applicable regulations, and coordinated with appropriate Dugway Directorate staff sections.
- c. All media members must be under DPG PAO or PM escort while on DPG.
- d. Prior concurrence by the Department of the Army must be obtained for visits and tours by national media to the installation.
- e. A one week prior notification to DPG PAO will be necessary for visits by local media; two-weeks notification is necessary for national media representatives. Notification will include names, organizations represented, coverage planned and equipment to be used (video/still camera, tape recorder, etc.).
- f. Cameras are prohibited beyond Fries Park at DPG and will be confiscated unless an approved camera pass is obtained from the DPG Instrumentation Branch.

1-16. ADJUTANT/PROTOCOL: The DPG Protocol Officer will be provided the following information for units training at DPG.

- a. A list of known VIPs in the grade of O6 and above and all state and government officials that will visit training exercises on DPG.
- b. Requests for VIP quarters.
- c. Requests for all functions for official visitors; i.e., formal/informal luncheons and dinners, etc.

1-17. SPECTATORS:

- a. Requests for spectators on ranges or training sites must be coordinated with P&O.
- b. Spectators at test or training events must be controlled by the OIC. Personnel must be kept clear of hazardous areas, must be briefed on safety, and must be provided safety and hearing protection, if needed.
- c. Spectators on a Firing Range will be IAW AR 385-63, para 4-9.

1-18. MAPS: Maps of the DPG military reservation can be obtained at the DPG Facility Engineering work order desk, Bldg 5474, phone 2214.

1-19. RECOMMENDATIONS FOR CHANGE: Users of the DPG range complex are encouraged to comment on

this regulation. Recommendations for additions, deletions, or other changes should be addressed in writing to Commander, U. S. Army Dugway Proving Ground, ATTN: STEDP-DBO-PO, Dugway, UT 84022-5000.

TABLE 1-1
OFFICER-IN-CHARGE (OIC) AND
RANGE SAFETY OFFICER (RSO) REQUIREMENTS

<u>WEAPON SYSTEM OR DEVICE</u>	<u>OIC</u> (note 1)	<u>RSO</u> (note 1)
Practice hand grenade; practice rifle grenade; subcal training devices; laser ranges; firing devices, simulators; trip flares; small arms; machine guns.	E-6 & Above	E-6 & Above
Chemical training munitions and smoke.	E-5 & Above (note 2)	None Required
Aerial gunnery; air defense weapons; flame throwers; live hand grenades; live rifle grenades; mines and demolitions; mortar; recoilless weapons; rockets.	E-7 & Above	E-6 & Above
Artillery	Officer	E-7 & Above
Live-fire exercises using organic weapons	Officer	E-6 & Above
CALFEX using external fire support (note 3)	Officer	Officer

NOTE 1: Officers-in-Charge and RSOs must be trained and/or qualified on the weapon or device being used and Range Safety Certified. See Chapter 7. Indirect-fire OICs and RSOs must also be Command Safety Certified. See Chapter 8.

NOTE 2: During NBC training, the OIC and RSO must be NBC qualified, either by award of NBC MOS or by graduation from an installation NBC school. Unit commanders must certify OICs and RSOs by memorandum to Range Control, showing name, rank, SSN, and source of qualification.

NOTE 3: OIC will be Field Grade Officer for Battalion or larger size units.

NOTE 4: For activities not listed above, see the facility description in the appropriate Appendix.

THIS PAGE LEFT BLANK

CHAPTER 4

SCHEDULING OF RANGES AND TRAINING AREAS

4-1. General. The use of ranges, training areas, and associated airspace at DPG for any purpose requires the approval of the P&O. All requests to establish training exercises/problems, modify previously approved training exercises/problems, or to designate tests and special projects will be submitted to P&O. Requests should come through the proper chain of command prior to submission to P&O. The RCO, will coordinate requests through appropriate DPG staff agencies.

4-2. Range Support. Range support will be provided as detailed in Range Requests and other documents as appropriate. Range Control support is required for any training or exercise on DPG ranges or training areas or as specified in Chapter 15. Training units may require Meteorology Data, airfield support (ground support, refueling), billeting (BOQ or NG licensed facilities), mess facilities, or other base operations support. Those support requirements must be specifically addressed in the Range Request. Request for DPG support requires funding which will be accomplished under DOD 4000.19 R and supplements thereto. Transfer of funds for DPG support must be accomplished at least three weeks in advance to ensure the fund cite is established prior to unit arrival. Send DD Form 448 for reimbursable funding to STEDP-DBO-RM-B. Users will fund all labor, supplies, instruments, equipment facilities, utilities, and administrative services required to support their training.

4-3. Dugway Range Management.

a. Ranges and their capabilities are listed in Appendix B. Use of established ranges for weapons or courses of fire not specifically authorized by this regulation is prohibited without prior coordination with and clearance by P&O.

b. Special live-fire exercises on any part of DPG must be coordinated with and approved by the P&O, DEP, and SA. Operations/safety contracts and surface danger zone overlays are required. See Chapter 9 and Appendix E.

4-4. Non Firing Training Facility Management. Training facilities are listed in Appendix C. Occupation, use, and clearance information is contained in Chapter 13.

4-5. Training Area Management.

a. Dugway maneuver training areas use and guidance is described in Appendix D.

b. Direct early coordination between users and P&O for ARTEP and other special land use or training exercises is required.

4-6. Airspace Management. Dugway airspace use is governed by 1 Oct. 87 MOU between DPG and Det 1, 412th TS and Chapter 11. Organizations involved in flight operations must ensure that aviators are aware of local airspace restrictions. See Chapter 11 and Appendix F.

4-7. Planning and Operating Considerations. Personnel responsible for preparing requests for range training facilities, and for programming the exercise/problem must consider the criteria established in pertinent FM/TM, DPGR 350-2, AR 385-62, AR 385-63 and AR 385-64. No portion of the surface danger area for weapons or explosives will intersect or cross the following areas:

- a. Test and evaluations facilities.
- b. Areas being used for West Desert Test Center (WD) testing.
- c. Reservation boundaries.
- d. Post ammunition storage area and post ammunition vehicle holding area.
- e. Built up areas and the cantonment area.

4-8. Survey Information Center.

- a. The Lockheed Survey Information Center (SIC) is responsible for the supervision of all permanently established survey control points on DPG.
- b. The positions of all Survey Control Points (SCPs) within DPG will be listed in either the geodetic trig list or the firing point trig list.
- c. Standard survey disks or markers emplaced in concrete monuments, bedrock or permanent type structures will be used to mark geodetic and artillery SCPs.
- d. Permanently established firing points and orienting stations will be concrete monuments, approximately 10 inches in diameter. A standard survey disc will identify the point over which an instrument must be plumbed. A witness mark will identify the point. Ends of orienting lines will be identified by metal survey quad markers erected over standard control points, or by six foot high black and white poles set in concrete.
- e. Quad markers consisting of tall, highly visible metal survey targets will be erected over selected geodetic and artillery fourth order SCPs. Quad markers will not be erected over artillery fifth order control points.
- f. New permanent survey control points will be established only with concurrence of P&O.
- g. P&O will exercise general staff supervision over all survey control within DPG.
- h. The Survey Information Center, operating under Lockheed will:
 - (1). Staff through using units, a trig publication list of geodetic and artillery SCPs laying within DPG.
 - (2). Staff through using units, a firing point trig list publications.
 - (3). Periodically publish changes and additions to the trig list.
 - (4). Take action on all requests for additional survey control and coordinate the efforts of all agencies concerned.
 - (5). Maintain liaison with all survey units on post.
 - (6). Advise units on matters pertaining to survey.
- i. Users will immediately notify the RCO if any SCPs or markers are missing or damaged.

CHAPTER 6

IMPACT AREAS

6-1. General.

a. Dugway Proving Ground has three impact areas for training: White Sage, Wig Mountain and Causeway. All impact areas are marked with warning signs, barriers, and/or guards. Passing any of these hazard warnings without Range Control permission is forbidden. Access to White Sage Impact Area must be cleared thru Range Control. Use of the observation point located in the Simpson Butte Area must be cleared thru the RCO. Use of the Wig Mountain and Causeway Impact Areas require unit road guards.

b. All impact areas are hazardous and off limits to all personnel except as coordinated with and cleared by the RCO. Entrance into impact areas requires a DPG EOD Escort.

6-2. Duds. All dud ordnance items are extremely hazardous and must not be disturbed. Any dud found along the boundary of or outside an impact area must be reported to Range Control immediately for evaluation by EOD.

6-3. Impact Requirements.

a. All firing on established ranges and firing points will be conducted to cause bullet or projectile impact in the designated impact area. Impact outside an authorized area will be reported to Range Control immediately.

b. Officers in Charge of special firing courses involving direct, indirect, aerial weapons, or laser devices, must know and identify to their personnel the azimuth or deflection and elevation limits established by approved overlays that will keep weapon, ammunition or device effects within the designated impact area for the course or event.

6-4. Barriers and Guards.

a. Some established ranges and most special firing courses have barrier and guard requirements to restrict entry of nonparticipating personnel into hazard zones. Placement and security of these barriers and guards are the responsibility of the using unit and will be checked by the Range Inspection Team.

b. Barriers may be permanently emplaced gates or temporary barricades provided by the using unit.

c. Unless specifically exempted by Range Control, all hazard area guards placed by a unit must have radio or telephone communications with the range. Roving patrols must have radio contact with the CP and should also carry portable public address sets to aid in announcing firing hazards.

d. Road guards and barricades will not be bypassed without the permission of the range OIC. Barricades must be removed as soon as possible following the conclusion of the mission dictating their use.

6-5. Impact Area Trespass. Anyone observing personnel or vehicles in an impact area must inform Range Control (FM 36.10, telephone 5141) immediately. Range Control will call a check fire and dispatch a Range Inspection Team or Security to investigate.

6-6. Maneuver in Impact Areas.

a. Units desiring to maneuver in or through permanent impact areas must coordinate routes in the initial range

request to P&O.

- b. Due to extreme dud hazard, the DPG impact areas will not be scheduled for ground training.

6-7. Explosive Ordnance Disposal Support.

- a. US Army Escort and Disposal Unit EOD soldiers provide emergency response to training unit incidents on DPG 24 hours a day.

- b. Army EOD must respond and render safe, remove, or dispose of the explosive or chemical hazard. Requests for assistance reported to Range Control or directly to EOD must include the following: A description of item found or problem; incident location; point of contact; phone number or radio call sign and frequency; and a rendezvous point. A guide should be made available to guide the team to the incident location especially during hours of darkness. Misfires or malfunctions involving artillery weapons must be handled IAW procedures in applicable weapon TM prior to requesting EOD support.

- c. Army EOD has the capability to respond to USAF aircraft with hung ordnance emergencies. Disposition of downloaded bombs and fuzes should be provided to DPG prior to start of exercise.

- d. EOD personnel will respond to dud munitions that are required to be cleared immediately, i.e., duds that are found in maneuver areas or duds that land outside the impact area. Any other duds will be cleared as soon as possible after they occur. Involved forward observers will assist in locating duds. Otherwise, duds will be cleared only from areas specifically designated by the Commander, DPG, after ENDEX.

- e. Response time.

- (1). When the team is located at the EOD offices, response time to aircraft with in-flight emergencies will be within 5-10 minutes after aircraft touch down at the NW Decon Pad, Michael Army Airfield. Arrival time to the aircraft should not exceed 30 minutes if the EOD team is located elsewhere on DPG.

- (2). A team will respond to other EOD incidents within 60 minutes after a request for assistance. Arrival time will vary based on the incident location.

- f. EOD personnel will escort visitors into dedicated impact areas IAW AR 385-63. EOD personnel will not enter impact areas during the hours of darkness except in an emergency to save life or property. EOD personnel will not conduct routine demolition operations during the hours of darkness.

- g. Units conducting P&O approved target placement for special firing courses will be required to meet the above requirements.

6-8. Impact Area Description. All impact areas are shared with the Test and Evaluation activities at DPG.

- a. White Sage Impact Area

Beginning at grid UV 466405, to UV 466340, to UV 410340, to UV 410405, point of beginning. A 1000 meter buffer zone must be drawn inside the above description and that enclosed area will constitute the impact area.

- b. Wig Mountain Impact Area

Beginning at grid TV 730675, to TV 730590, to UV 225590, to UV 225675, point of beginning. A 1000

meter buffer zone must be drawn inside the above description and that enclosed area will constitute the impact area.

c. Causeway Impact Area

Beginning at grid TV 880440, to TV880370, to TV990460, to TV99 0370, point of beginning. A 1000 meter buffer zone must be drawn inside the above description and that enclosed area will constitute the impact area.

THIS PAGE LEFT BLANK

CHAPTER 8

INDIRECT FIRE

8-1. General.

- a. This chapter discusses use of ranges and facilities for live fire of mortars and field artillery. The intent of this chapter is to provide procedures which are safe, comply with AR 385-63, yet provide the most realistic training environment for commanders. The governing factor is safety. Airspace clearance requires that units request activation of R6402 not less than 30 minutes prior to firing. See Chapter 11. Active firing points and hazard areas are announced in the Weekly Range Schedule (UTTR) and Daily Test/Training Schedule published by Range Control.
- b. Personnel in charge of firing mortars or field artillery must be familiar with AR 385-63 and all current changes and supplements thereto.
- c. Hearing protection is required for all personnel on active mortar and field artillery firing points.
- d. Officers in Charge must ensure that data includes safe range to canister impact before firing illumination rounds.
- e. Firing hours are not restricted. Requests for DPG Range Complex will be considered by P&O and, if restrictions on firing hours or trajectory limits are necessary, P&O will notify unit by phone and in range request response.

8-2. Command Safety Certification Program.

- a. All units firing field artillery and mortars at DPG must establish and maintain a Command Safety Certification program, LAW Chapter 11 of AR 385-63, for personnel controlling indirect fire exercises. This program must exist at battalion and brigade/Division Artillery level, as a minimum. Certification is required for personnel serving as artillery or mortar OIC or RSO; firing battery commander; battery XO; mortar platoon leader; artillery FDO; artillery chief of firing battery; artillery gunnery sergeant; mortar platoon sergeant; and artillery howitzer section chief. Record of certification of all personnel except OIC/RSO must be maintained at the unit.
- b. Unit certification of OIC/RSO must be consolidated on a memorandum, with unit letterhead stationary for non U.S. Army units, to P&O per the example at Figure 8-1. The correspondence must be signed by the battalion or separate battery/company commander and is valid for one year from date unless superseded sooner by the unit. Single entry additions and deletions will not be accepted. Certification of personnel involved in firing incidents must be suspended during incident investigation.
- c. Command Safety Certification Programs must be reviewed annually in March by the Installation Safety Office and by P&O. Units firing field artillery or mortars must submit an updated copy of their programs to the Installation Safety Office, STEDP-CM-SA and P&O, STEDP-DBO-PO. Programs must be reviewed and then filed by the RCO. Units without an approved program and certification memorandum or letter on file with the RCO will not fire.
- d. Officer in Charge. The OIC will be the appropriate battery commander or his command safety certified representative. The OIC is responsible for all aspects of safety in the firing unit while it is in the training area. The OIC must obtain firing information and limitations from Range Control prior to firing. The OIC or his

representative must compute safety data using firing position/point location and the location of the target area. The number of dog legs required is the option of the OIC. This safety data must include the lateral safety limits, the minimum and maximum ranges, and minimum fuze time/VT ranges. The OIC must supervise the conversion of the safety data into a safety diagram and ensure that this diagram is verified by a separate command safety certified individual. The safety diagram must provide right and left deflection limits, minimum and maximum quadrant elevations, and minimum safe fuze times for all charges to be fired. The safety diagram must be provided, modified as necessary by the executive officer's minimum quadrant elevation, to the appropriate members of the firing battery.

e. Firing Battery Executive Officer is responsible for the safety practices of the firing battery. He is assisted by the Chief of Firing Battery and the Fire Direction Officer/NCO.

f. Assistant Executive Officer/Fire Direction Officer has primary responsibility for computing the safety diagram from the safety data and for ensuring all safety diagrams are updated after registrations and receipt of current meteorological data. He will ensure all firing data are within prescribed safety limits, prior to transmission to the firing battery.

g. Chief of Firing Section (gun/howitzer section chief) is responsible for ensuring that only safe practices take place at or near his weapon, to include verifying that the announced and proper data for quadrant and deflection are applied to his weapon and that the proper charge, fuze, and projectiles are fired. He has the final responsibility for the safe firing of his weapon.

NOTE: The requirement for indirect fire Command Safety Certification is binding on all units 30 days after date of publication of this regulation. The requirement for review of the Safety Certification Program is binding 180 days after date of publication.

8-3. Firing Points.

a. Field artillery and mortar firing points are permanent live fire training facilities established by 4th order survey and listed in the I Corps Artillery Trig List. Artillery firing point monuments are shell cases embedded in concrete. Mortar point monuments are concrete markers. Mortar platoon base pieces must be within 20 meters of the firing point monument. Field artillery pieces must be placed so that the greatest displacement along the gun target line is 500 meters to left or right in width, by 500 meters to front or rear in depth. In order to facilitate tactical realism, and on a case by case basis, the artillery training unit commander may be authorized to establish firing positions anywhere within the defined training areas. Common sense must be used by the commander to protect the environment in the training area. It must be recognized by each using commander that deliberate damage to the environment will result in restrictions being placed on the unit's training. See Chapter 3 for environmental considerations during training. Requirements for the NO Firing Point Concept described above will be as follows:

- (1). Establishment of firing point from existing FP.
- (2). Calling in coordinate of new firing point to Range Control.
- (3). Range Control approval to fire from newly established firing point.
- (4). Left and right limits conform to establish training area boundary.
- (5). Projectiles fall within established impact area.

(6). That no other firing unit is within surface danger zones (SDZs) A, B, or C.

(7). Safety Fans are established for the established firing points to ensure limits fall within established safety limits.

b. Mortar point OICs or RSOs who have the range assignment must be present on site throughout the period of use. Artillery OICs (usually the battalion S-3 or FDO) may sign for and open a group of firing points to be used by units of the same battalion, and must be with the unit in the field throughout the firing.

8-4. Mortar Firing.

a. Overhead fire by mortars is prohibited. Mortar OICs and RSOs must know the extent of their authorized target area as described in the mortar point SOP, and must ensure that no personnel are located therein or under the trajectory during firing. When plotting boards are used, the target area overlay in the mortar point SOP must be drawn on the board. The overlay must also be drawn on mortar forward observer's maps.

b. The OIC must ensure that all safety and chain of command personnel involved in firing have successfully completed the Command Safety Certification Program.

c. 81mm and 107mm mortars must be laid using either the M2 aiming circle or the M2 compass, as determined by the trainer or by unit equipment availability. However, the lay must always be checked by an independent M2 aiming circle.

d. 60mm mortars must be laid as above unless aiming circles are not authorized by MTOE at battalion level. When aiming circles are not authorized, 60mm mortars will be laid and checked with two M2 compasses. Check readings between compass and mortar sight, and between lay and check compass, must agree within 10 mils. An independent check instrument must be present and in use. There are no exceptions.

e. Officers in Charge will ensure that individual mortars are separated by the distance required in the weapon FM. The bursting radius of the ammunition being fired will be used as a minimum safe distance (MSD) from each hot tube, inside which nonessential personnel are not permitted. All personnel within this MSD during firing must wear military protective headgear (kevlar helmet).

f. Officers in Charge and RSOs must use appropriate mortar FMs, TMs, and TCs in organizing mortar positions and conducting firings.

8-5. Field Artillery Firing.

a. When personnel occupy any part of surface danger area as defined in AR 385-63, Chapter 11, only lots of ammunition and components approved for "overhead fire" must be used. Shell ICM and all mortar ammunition will never be fired over troops.

b. At least one commissioned officer or civilian equivalent must be present on each firing point from which live fire is to be conducted. This officer, usually the Executive Officer, is designated the Position Commander and may also be OIC. The Position Commander performs those duties listed in AR 385-63, Chapter 11. The position RSO must be an E-7 or higher and can have no other duties during firing.

c. Field artillery SDZs are established by AR 385-63, Chapter 11. Hazard Areas A, B, C, D, and E vary dependent on weapon and ammunition fired. Personnel access to Areas, A, B, and C is prohibited. During indirect

fire, personnel not involved with training may occupy Hazard Area D and that portion of Area E greater than 350 meters from the weapon. Only weapon crews and operational personnel involved in the firing may be closer than 350 meters to the weapon. Firing position commanders must ensure that the 350 meter hazard area is kept clear of unauthorized personnel. This may require placing guards on range roads in front of the battery.

NOTE: Personnel from the Range Inspection Team conducting spot checks of firing positions are to be allowed within this restricted portion of Area E; special visitors sponsored by the unit will be admitted by the firing unit chain of command. Weapon crews and operational personnel involved in the firing must wear military protective headgear (kevlar helmets).

d. In order to facilitate training, the lateral and range limits must be determined by the Firing Unit OIC to allow him to pick the most realistic firing position/point within the training area assigned. Dugway Range Control will verify the left and right lateral limits and minimum and maximum limits prior to allowing the unit to commence firing.

e. Computation of Safety Data.

(1). The OIC of firing points or his representative must supervise the preparation of safety data with the firing battery assistant executive officer/fire direction officer (AXO/FDO). This may be done manually or with computer assistance. The AXO/FDO has primary responsibility for the preparation of technical safety data.

(2). In order to compute safety data two elements must be known; the firing position location and the target area. The OIC must provide to the AXO/FDO the location of the firing unit. This regulation provides the location of the authorized target areas. Map spotting is the least acceptable method of determining position location and should be updated with survey data as it becomes available. Using the firing position location and the target area, the AXO/FDO must determine the basic safety diagram as explained in FM 6-50:

(a). Minimum and Maximum Ranges from the firing position to the near and far edges of the target area.

(b). Left and Right Azimuth limits to the target area.

(c). At the option of the OIC, Dog Legs may be added to the Left and Right Limits to increase the area which may be safely fired. In no case will dog legs allow firing outside the authorized target area.

NOTE: The above data must be recorded on a firing chart and/or tactical map in the battery fire direction center. This displays the limits of safe fire.

(3). The AXO/FDO must compute the Minimum and Maximum Ranges for each charge and projectile to be fired during training exercises. This may be done manually or with any authorized fire direction procedure. Site must be computed using the minimum altitude at the maximum range and maximum altitude at the minimum range line. These sites must be added to the corresponding elevations to determine the minimum and maximum quadrants which are safe.

(4). The Left and Right Azimuth limits firing deflections, based on the battery azimuth of lay, will be determined using manual or computer procedures.

(5). Minimum fuze settings will be determined as follows:

(a). Mechanical Time - fuze setting corresponding to the elevation at the minimum range for each charge to be fired.

(b). Variable Time (VT) - fuze setting designed to arm three seconds prior to the time set on the fuze. They may arm as early as 5.5 seconds prior to the time set on the fuze. In order to allow the maximum area in which fuze VT maybe fired, the time of flight to the minimum range line must be determined and 5.5 seconds added. When rounded up to the nearest second, this will be the minimum safe time for fuze VT.

(6). The above information must be converted to a "SAFETY T" for each charge to be fired. The OIC and AXO/FDO must have the data verified by a second command safety certified individual, normally the battery chief, and provide the information to the firing battery. Firing battery personnel who must have the Safety T information will be the battery executive officer, chief of firing battery, gunnery sergeant, and the section chief of all firing guns or howitzers.

(7). FM 6-40 and FM 6-50 provide details in the preparation of the basic safety T and associated data. Safety computations for high angle and shell illuminating, shell smoke (HP and HC) are discussed in FM 6-50, Chapter 12. High Angle Deflection Limits can be modified by adding the maximum drift for the ranges involved to the right deflection limit and the minimum drift to the left deflection limit.

(8). Ultimate responsibility for the preparation and use of the safety data determined above rests with the OIC.

f. Actions during firing:

(1). For cannons using separate loading ammunition, the lanyard must not be attached to the firing mechanism until the designated cannoneer has announced "READY".

(2). For weapons which produce blast over pressure problems with specific charges, special precautions must be taken. Cannoneers displaying shortness of breath or chest discomfort, bleeding from mouth, nose or ears or excessive shakiness directly associated with weapon firing may be suffering from a blast over pressure injury. Medical attention must be sought. See weapons TM for designated firing procedures.

(3). Fuzes:

(a). Alteration of fuzes is prohibited.

(b). Care must be exercised in handling ammunition to protect the point of fuzes from damage.

(c). Fuzes must be screwed down by hand and then firmly seated with the correct fuze wrench. See weapon TM.

(d). Only standard fuzes must be used during training.

(e). Firing without a fuze is prohibited.

(4). Rammed rounds which cannot be fired and which have been removed from the tube will not be rammed again. They must be declared unserviceable and returned to the issuing ASP for disposal. If rounds cannot be moved, notify EOD who will determine if round must be destroyed on site.

- (5). Only propellant charges of the type authorized for the round and weapon must be used.
- (6). Unused propellant increments must be collected at each gun/howitzer in a metal or wooden covered container at least 25 meters to the rear of each piece and prime mover.
- (7). No Smoking forward of the designated powder pit. This includes no smoking in or around the gun/howitzer. This is the section chief's responsibility to enforce.
- (8). Registrations must be conducted on points in the center of the target area prior to engaging targets near the target area boundaries.
- (9). The burning of unused propellant increments at unit firing positions is PROHIBITED. Unused increments will be transported IAW Chapter 5 for destruction/storage as directed by Dugway Proving Ground personnel.
- g. Fire Fighting Requirements. The danger of grass fire is high. Each battery sized unit must maintain a fire fighting reaction group of at least fifteen people to respond if requested by Range Control. Fires in the impact area will not be fought. Fires in the training area or firing position area will be contained by the using unit. Dugway Range Control must be contacted if fires are observed in the training area.
- h. Misfires and Malfunctions. Appropriate weapon TMs have information pertaining to the actions required for misfires and malfunctions. Units are responsible to know and follow the procedures for misfires and malfunctions. Assistance from Dugway EOD and QASAS, if required, can be coordinated through Dugway Range Control.
- i. Direct Fire of Field Artillery Weapons. The direct fire of Field Artillery is permitted. Care must be taken to ensure that no one is between the gun/howitzer and the target, (i.e., NO OVERHEAD FIRE). The maximum range for Direct Fire is the range corresponding to Elevation 267 for the charge to be fired (see AR 385-63, Chapter 11) and must be a minimum of 850 meters from firing point. The technical manual procedures for direct fire of the weapons system must be followed.
- j. When winds exceed 18 knots, shell illumination, white phosphorus, smoke, and all other pyrotechnics or incendiary devices must not be fired without the permission of Range Control. Pyrotechnic or other incendiary devices must not be used where there is a possibility of starting a grass fire or causing damage to equipment or vehicles.
- k. All artillery units are required to have an Internal Range Safety and Firing SOP. The SOP must be on site during firing operations.

8-6. Limited Visibility. Mortars and field artillery may not be fired when targets are masked by fog, smoke, or other obscurants, unless an operational impact locating radar is in use.

8-7. Observation. Regardless of visibility, all impacts must be observed visually or by radar. The OIC will not repeat for rounds sensed as lost until firing data and weapon lay are thoroughly checked.

8-8. Firing Point Development.

a. Development of artillery firing points is an installation responsibility carried out by the RCO in coordination with I Corps Artillery. Sufficient firing points will be developed and maintained to support Active and

Reserve Component unit training and evaluation. The I Corps Artillery Trig List is the instrument by which firing point survey data are noted and preserved. A copy of the Trig List will be maintained by I Corps Artillery and the RCO. The Commander, I Corps Artillery will ensure that all changes to the Trig List are provided to the RCO.

b. The Trig List must be reviewed annually by the I Corps Artillery S-3, P&O, and DPG Environmental Programs Office to determine whether firing points must be changed, added, or deleted in light of past and projected training.

c. New firing points, or major alteration to existing firing points, will be developed as follows:

- (1). Reserve Component proposals must be submitted through P&O.
- (2). The RCO, in coordination with Safety, DIS, and DPG Environmental Programs Office will review and develop the work request for terrain alteration as necessary.
- (3). Upon completion of site preparation work, I Corps Artillery must conduct 4th order survey, publish a change to the Trig List, and provide the new safety data to P&O.

8-9. Mortar and Artillery Firing Incidents.

a. Any projectile that lands or bursts outside approved limits, or is suspected to have landed outside limits, must be reported to Range Control (FM 36.10, telephone 5141) immediately, as follows:

- (1). Name, unit and location of person making report.
- (2). Date, time and location of impact.
- (3). Any injury to personnel. If injuries require aerial or ground ambulance evacuation, Range Control will initiate the MEDEVAC immediately, then record the information below.
- (4). Number and type of rounds.
- (5). Estimated height (air burst).
- (6). Whether the crater has been found (ground burst).

NOTE: If a crater is available, the reporting unit/individual must ensure that it is secured and that no evidence is disturbed until the Range Investigation Team arrives.

- (7). Equipment damage, if any.

b. Range Control will:

- (1). Order check fire of all affected ranges and firing points by broadcasting the command "CHECK FIRE, FREEZE" on the Range Control net (FM 36.10). This command is used only for rounds out of impact.
- (2). Initiate MEDEVAC, if needed.
- (3). Notify the following (in order):

- (a). MEDEVAC (as needed)
- (b). Plans and Operations (P&O)
- (c). Safety
- (d). Firing Unit Headquarters
- (e). EOD (as needed)
- (f). QASAS

(4). Monitor MEDEVAC (if any) and the investigation, and allow firing units to return to hot status as the incident is isolated in the field. Return to hot status may only be allowed by Range Control after consultation with Safety, QASAS, P&O, and the investigation team.

c. All units on affected ranges and firing points, regardless of location, impact area, or weapons, must cease firing at the command of "CHECK FIRE, FREEZE" from Range Control. Indirect fire weapon OICs and/or Position Commanders must:

- (1). Have all weapon crews fall in at the rear of their pieces. "AS IS".
- (2). Ensure that all data on all weapons and aiming circles is preserved.
- (3). Ensure that all ammunition components and tools remain undisturbed.

(4). Survey conditions on the firing point without disturbing weapons, ammunition, or equipment and prepare to brief the Range Inspection Team and, if necessary, the AR 15-6 investigating officer.

NOTE: Unit personnel must not conduct any checks of data, propellant, fire control instruments, craters or any other aspect of weapons or impact points.

d. The Range Investigation Team and the Unit S-3 must analyze available evidence to isolate the responsible unit or to develop a list of candidates. This investigation must be completed with all dispatch, while ensuring that no items of evidence are lost or overlooked. If the incident caused fatal personnel injury or equipment damage estimated in excess of \$200,000, the Range Investigation Team must ensure that all sites are preserved by the Units involved pending arrival of an Army Safety Center Team from Fort Rucker.

e. P&O must receive the initial report of findings from the Range Investigation Team and inform the suspect unit MSC, or DRCS, that an investigation IAW AR 15-6 must be conducted. If multiple units are involved and the Range Investigation Team cannot determine which is responsible for the incident, all MSCs involved must conduct an investigation. The name(s) of the investigating officer(s) must be reported by the MSC to P&O within one hour of notification. The investigating officer must be on site within one hour of notification, and be briefed by the Range Investigation Team and by all concerned unit personnel. A formal report of findings must be forwarded through the MSC chain of command to reach P&O (STEDP-DBO-PO) within 10 calendar days of the incident, with an information copy provided to the Installation Safety Officer (STEDP-CM-SA).

8-10. Handling of Excess Mortar and Artillery Propellant Charge Increments. Excess increments will be disposed of as directed by DPG personnel.

8-11. Medical Support and MEDEVAC.

a. Medical Support. See Chapter 1.

b. MEDEVAC. See Chapter 1. MEDEVAC procedures will be in each firing point packet.

8-12. Declination Station and Survey Information Center. I Corps Artillery and P&O maintain the DPG Trig List and Declination Station.

UNIT LETTERHEAD
(Sample)MEMORANDUM FOR Commander, U.S. Army Dugway Proving Ground, ATTN: STEDP-DBO-PO, Dugway,
Utah 84022-5000

SUBJECT: Unit Safety Certification

1. References:

- a. Chapter 4, AR 385-63
- b. Chapter 8, DPGR 350-2

2. The following personnel have been trained and tested per the reference and are certified to perform the duties shown:

<u>NAME</u>	<u>RANK</u>	<u>SSN</u>	<u>UNIT</u>	<u>DUTY</u>
WILLIAMS, D.E.	CPT	xxx-xx-xxxx	C/1-140 FA	Firing OIC
BROADSIDE, James	1LT	xxx-xx-xxxx	C/1-222FA	FP Safety Officer
COURAGE, John	SFC	xxx-xx-xxxx	18 SF Gp	DZSO
HARRY, Steve P.	SFC	xxx-xx-xxxx	B/1-145FA	Gunnery Sergeant
PETER, Willie J.	CPT	xxx-xx-xxxx	C/2-222FA	Fire Direction Officer
CHARLIE, Richard	2LT	xxx-xx-xxxx	444 EN Co	Range Safety Officer

3. This certificate is effective for one year from the above date or until superseded.

JOHN P. DOE
LTC, IN
Commanding

Training and Associated Impact Areas of Dugway Proving Ground

approx. scale 1:338,476

UTM Projection
Zone 12
Clarke 1866 Ellipsoid
NAD 27

Map created by
Amy Renzel
Postgrad. Resch. Participant
in USAIC prog. admin. by ORNL

