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**US Army Corps
of Engineers®**

**U.S. ARMY CORPS OF ENGINEERS
PROTECTIVE DESIGN CENTER
TECHNICAL REPORT**

**WEAPONS SAFETY ASSESSMENT
Volume 3 of 5 – Review Criteria**



Prepared for:
**U.S. NUCLEAR REGULATORY COMMISSION –
OFFICE OF NUCLEAR SECURITY AND INCIDENT
RESPONSE**

Prepared by:
R. Ward & Associates, Inc.

When separated from Volumes 4 and 5 of the WSA, this volume is DECONTROLLED

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FORWARD

Submission of a weapons safety assessment (WSA) is one component of an application by a licensee or certificate holder (hereafter referred to as “applicant”) to the U.S. Nuclear Regulatory Commission (NRC) for combined enhanced weapons authority and preemption authority. Refer to 10 CFR 73.18¹ and DG-5020² for complete details on the application process. Applicants for stand-alone preemption authority are not required to complete a WSA.

Enhanced weapons, as defined in 10 CFR 73.2³, means any short-barreled shotgun, short-barreled rifle, or machine gun as defined in 27 CFR 478.11⁴. Enhanced weapons do not include destructive devices as defined at 18 U.S.C. 921(a) (4)⁵.

This report presents a WSA methodology acceptable to the NRC for an application for combined enhanced weapons authority and preemption authority; however, it is not exclusive. Other methodologies based on sound safety, scientific, and engineering principles are also acceptable.

This report is presented in five volumes. The content of each volume is described below.

- *Volume 1: Template Instructions* - This volume provides detailed instructions for completing the WSA template presented in Volume 2: Template. Section numbering of the explanations and instructions in this volume correspond to the section numbering of the template to facilitate ease of navigation between the two volumes.
- *Volume 2: Template* – This volume provides a template for information to be included in the WSA for submittal to NRC.

¹ Title 10 of the *Code of Federal Regulations* (10 CFR) 73.18, “Authorization for Use of Enhanced Weapons and Preemption of Firearms Laws” (Unclassified)

² Draft Regulatory Guide (DG) -5020, “Applying for Enhanced Weapons Authority, Applying for Preemption Authority, and Accomplishing Firearms Background Checks Under 10 CFR Part 73” (Unclassified)

³ 10 CFR 73.2, “Definitions” (Unclassified)

⁴ 27 CFR Part 478, “Commerce in Firearms and Ammunition” (Unclassified)

⁵ Title 18 United States Code, Chapter 44, “Gun Control Act of 1968” (Unclassified)

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- *Volume 3: Review Criteria* – This volume describes the criteria that NRC will use in evaluation of a submitted WSA.
- *Volume 4: Reference Documents* – This volume is a collection of digital files that can be used by the applicant for additional information. The information pertains to weapons, weapons maintenance, training, and range design and range safety.
- *Volume 5: Sample Template* – This volume provides an example of a completed WSA template for a fictitious site. This is a clarification tool and visual aid to the applicant.

Completion of the template should be accomplished by a team composed of members from various elements of the applicant's organization. Examples of elements outside of security and what they can contribute are as follows:

- Facility safety office personnel can provide information on chemicals and other hazardous items on the site.
- Facility emergency preparedness office personnel can provide information on the surrounding community.
- Facility engineering office personnel can provide drawings and maps as well as construction details for structures containing risk items.

The applicant's team should include at least one subject matter expert familiar with automatic and large caliber firearm usage to assist with the selection, risk evaluation, documentation, planning, training, and possible training range modifications for use of the enhanced weapons.

The information in this report has been determined to be Official Use Only – Security-Related Information and is to be withheld from public disclosure under 10 CFR 2.390¹.

However, once site specific information has been placed in the template contained in Volume 2, the applicant should mark, label, control, store, and transmit the document as safeguards information or classified information, as appropriate. The applicant should determine, using applicable guidance, the appropriate sensitivity level of the information and protect it accordingly.

¹ 10 CFR 2.390, "Public Inspections, Exemptions, Requests For Withholding" (Unclassified)

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INTRODUCTION

BACKGROUND

Recent changes to 10CFR73.18¹ allow U.S. Nuclear Regulatory Commission (NRC) licensee/certificate holders to obtain enhanced weapons for use as part of their physical protection program with NRC approval. Part of the approval process is the submission for review and approval of a weapons safety assessment (WSA), prepared by the licensee/certificate holder, which must demonstrate that the use of enhanced weapons will not cause undue risk considering the on-site and off-site conditions associated with the use of a specific enhanced weapon system.

As defined in 10CFR73.2², enhanced weapons are weapons registered under the National Firearms Act, e.g., machineguns, short-barreled shotguns, and short-barreled rifles.

PURPOSE

This volume provides guidance for reviewing an applicant’s WSA based on the template in Volume 2 of this report.

SENSITIVITY OF INFORMATION

The information in this report has been determined to be Official Use Only – Security-Related Information and is to be withheld from public disclosure under 10 CFR 2.390³.

Each entity completing a WSA must determine the sensitivity of the information, and protect accordingly. Early in the WSA process it is recommended to utilize personnel who have been designated as authorized to identify and mark sensitive unclassified and/or classified information. When filled out, the template in Volume 2 may be Official Use Only – Security-Related Information, safeguards information, or classified information. The applicant should mark, label, control, store, and transmit Volume 2 as appropriate for the level of sensitivity/classification of the information.

¹ Title 10 of the *Code of Federal Regulations* (10 CFR) 73.18, “Authorization for Use of Enhanced Weapons and Preemption of Firearms Laws” (Unclassified)

² 10 CFR 73.2, “Definitions” (Unclassified)

³ 10 CFR 2.390, “Public Inspections, Exemptions, Requests For Withholding” (Unclassified)

WSA REVIEW PROCESS OVERVIEW

The following outlines the WSA review process:

1. The reviewer should utilize three documents:
 - a. Volume 1: Template Instructions
 - b. Applicant's submittal package (Volume 2: Template and supporting maps/documentation)
 - c. Volume 3: Review Criteria
2. Applicant submittals that are incomplete (i.e., missing information in the template or supporting documentation, maps, training documentation, etc.) should be returned to the licensee/certificate holders for completion. Any requests for information not found in the application should be in the form of a request for additional information (RAI) to the applicant.
3. For ease of internal tracking of the NRC review, the reviewer should save the Volume 3 Review Criteria as "WSA Vol 3-Facility Name". (i.e. WSA Vol 3-Browns Ferry). The filename appears in the footer. The new filename will not change immediately, but will appear in the footer after a print preview.
4. There are 10 input fields in a summary worksheet in section 2-12 (Table 2-12.1) for the reviewer to enter the assigned Hazard Ratings. The reviewer should fill out the general review information in section 2-12 prior to beginning the review.
5. The Volume 2: Template generated Risk Levels are calculated entries used to alert the applicant to a potential problem or issue. These risk levels are a first level indicator. The written input associated with various items will, in many cases, lower the associated "Risk Level". The reviewer should base their evaluation on all of the information provided by the applicant.
6. The reviewer should review all of the written input and create a list of additional questions in the form of a RAI to the applicant, if necessary.
7. The reviewer analyzes the Risk Levels identified by the applicant. As the reviewer evaluates the applicant's input, they will evaluate the level of hazard this input poses to the people, the applicant's facility and/or the surrounding community and assign a Hazard Rating to the evaluated input.
8. Completion of the review process is accomplished by totaling the assigned hazard levels based on the applicant's WSA submittal package and documenting recommendations.

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9. A final review is performed by the Office of Nuclear Security and Incident Response and a safety evaluation report is provided back to the applicant informing them of the results of the WSA review.

At the beginning of the review take a moment to review the applicant’s input to Vol. 2, Section 2-11, and Item 52.

As an aid to the applicant and reviewers, certain input fields and sections will generate a risk level indication. These Risk Level indicators will appear as both a colored numeric field (Green, Yellow or Red) and a text field.

Risk Level	4	High
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These Risk Levels are based on the applicant’s input choices and are explained in Section 2-8 of Volume 1: Template Instructions. Risk Levels should signal the applicant and reviewers when additional explanation is necessary.

The reviewer should be aware of any “diluting” techniques the applicant may use to lower their risk level. This may be accomplished by adding lower numbers to input choices that may not be applicable; to dilute their overall score.

In this document, “Risk Level” will always pertain to an applicant’s input and “Hazard Rating” will always pertain to the reviewer’s input.

The remainder of this volume provides the reviewer with information to consider when determining hazard ratings for the items in the completed WSA submittal package.

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2-1: GENERAL INFORMATION		
Item Number	Descriptor	Rated or Non-Rated Element
1	Facility Name	Non-Rated Element
2	Submittal Date	Non-Rated Element
3	Physical Address	Non-Rated Element
4	Is this a re-submittal for this facility and weapon?	Non-Rated Element
5	City, State Zip	Non-Rated Element
6	Facility Phone Number	Non-Rated Element
7	Mailing Address	Non-Rated Element
8	City, State, Zip	Non-Rated Element
9	Mailing Address Phone Number	Non-Rated Element
10	Applicant Point of Contact (POC)	Non-Rated Element
11	Position Title of Applicant POC	Non-Rated Element
12	Work Phone Number	Non-Rated Element
13	Alternate Phone Number	Non-Rated Element
14	POC's E-Mail Address	Non-Rated Element
15	Alternate POC	Non-Rated Element
16	Position Title of Alternate POC	Non-Rated Element
17	Work Phone Number	Non-Rated Element
18	Alternate Phone Number	Non-Rated Element
19	Alternate POC's E-Mail Address	Non-Rated Element
20	Applicant's Plant Manager	Non-Rated Element
21	Work phone no	Non-Rated Element
22	Alternate phone no	Non-Rated Element
23	Plant Manager's E-Mail Address	Non-Rated Element

Table 2-1.1 General Information Item List

For this section the reviewer should:

1. Ensure that Items 1-3 and 5-23 are complete and accurate.
2. If Item 4 is YES, then ensure the reviewer has a copy of the previous submittal package. The reviewer should pay attention to any Items in the previous submittal package that were problem areas.

Reviewer scoring: None

Information for the reviewer to consider: None

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2-2: DESIRED WEAPON FOR SUBMISSION		
Item Number	Descriptor	Rated or Non-Rated Element
24	Select an enhanced weapon category	Rated Element
25	Identify the specific manufacturer, model, and caliber/gauge of the weapon desired	Non-Rated Element
26	Enter the maximum range (meters)	Non-Rated Element
27	How many of the desired weapons are being requested?	Non-Rated Element
28	How many will normally be deployed?	Non-Rated Element

Table 2-2.1 Desired Weapon Item List

For this section the reviewer should:

1. Ensure that the weapon category matches the weapon desired. If the weapon selection does not match the weapon category this may be cause to request additional information from the applicant.
2. Ensure that only one weapon has been selected.
3. Examine the number of weapons requested (Item 27 & 28) and make sure it is logical for the site. A stipulation may be required to acceptance of the application to limit the number of weapons allowed.

Reviewer Scoring:

1. The reviewer will assign a Hazard Rating to Item 25, in Table 2-12.1. The rating will be based on range and rate of fire. A suggested Hazard Rating table (Table 2-2.2) is provided on page 11.

Information for the reviewer to consider:

The applicant can only request one weapon for approval per form submitted. If the applicant chooses a weapon not listed in Table A-1 in Appendix A, Volume 4, it is the applicant’s responsibility to provide all like or similar information for evaluation.

If the reviewer does not have enough information on the weapon specified (Item 25) to complete review of the WSA, the applicant should be requested to provide additional information.

Different weapon types have varying characteristics including rate of fire per minute, ammunition characteristics, and behavior of the weapon system during discharge.

Weapon System Pros and Cons:

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Machine Guns:

As defined in 27CFR478.11¹, a machine gun is any weapon which shoots, is designed to shoot, or can be readily restored to shoot, automatically more than one shot, without manual reloading, by a single function of the trigger. The term shall also include the frame or receiver of any such weapon, any part designed and intended solely and exclusively, or combination of parts designed and intended, for use in converting a weapon into a machine gun, and any combination of parts from which a machine gun can be assembled if such parts are in the possession or under the control of a person.

PROS

1. Highly effective against personnel or material targets.
2. Provides effective suppressive fire.
3. Excellent weapon for fixed firing positions

CONS

1. The first ten to twenty rounds fired from some of the larger machine guns in full automatic mode allow the machine gunner to pull the “bullet trail” toward the intended target and this may produce stray rounds.
2. These weapons have long effective ranges (800-1800 meters) and can pose dangers to people and property far beyond this distance.
3. Most of these weapon systems can be used to patrol the property, but due to the size, weight and firepower of some of the larger machine guns, they may be better suited for fixed positions in this application.
4. Have the capability to cause extensive collateral damage.
5. Multiple rounds can penetrate barriers that would effectively stop a single round.
(See Volume 4: References, Appendix C: Ammunition Effects)

NOTE: Any weapon using .50 caliber ammunition should be considered extremely dangerous. This ammunition is dangerous due to its extremely long range and ability to penetrate most commonly constructed structures.

¹ 27 CFR Part 478, “Commerce in Firearms and Ammunition” (Unclassified)

Short Barreled Shotgun:

As defined in 27CFR478.11, a short-barreled shotgun is a shotgun having one or more barrels less than 18 inches (457.2mm) in length, and any weapon made from a shotgun, whether by alteration, modification, or otherwise, if such weapon as modified has an overall length of less than 26 inches (660.4mm).

PROS

1. Effective against personnel at close range.
2. Provides effective suppressive fire.
3. Can fire multiple projectiles of various sizes.

CONS

1. These weapons are not meant for point targets.
2. These weapons have short effective ranges (50m-150m) depending on the type of shot. It is not a desirable weapon for long distance engagements.
3. Relatively large and can have a heavy recoil.
4. The size and weight of the ammunition limits both the magazine capacity and the amount of ammunition carried.

Short Barreled Rifles:

As defined in 27CFR478.11, a short-barreled rifle is a rifle having one or more barrels less than 16 inches (406.4mm) in length, and any weapon made from a rifle, whether by alteration, modification, or otherwise, if such weapon, as modified, has an overall length of less than 26 inches (660.4mm).

PROS

1. Desirable weapon for short range situations, especially against targets wearing body armor.
2. Lower threat to the community since most short barreled rifles use shorter range ammunition. Excellent weapon for use inside a building with frangible ammunition. The weapon can be used with minimal collateral property damage.
3. Desirable weapons for patrol or close quarters engagements.

CONS

1. Weapon may have a tendency to pull or lift when fired due in part to its weight. This may increase the number of stray rounds.
2. Not a desirable weapon for long distance engagements.
3. Limited effectiveness against material targets.

Table 2-2.2 Suggested Weapon Hazard Ratings

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Hazard Rating	Weapon Type	Weapon/s
0	Not used for this Rated Element	
1	Short Barreled Shotgun	HS-10
		Mossberg 500
		Remington 870MCS
		Remington 11-87
		XM-26 LSS
2	Short Barreled Rifle	SCAR Mark 16
		SCAR Mark 17
		HK 416
		HK G36
3	Machine Gun	Colt Model 635
		M249 SAW
		M16A2
		M16A4
		HK 21E/23E
4	Crew served Machine Guns	M240B
5	.50 cal and other Specialized Weapons	M2HB
		M134 Dillon Gatling (7.62mm)

The reviewer will determine a hazard rating based on the desired weapon system chosen by the applicant. It is possible the weapon selected by the applicant will have characteristics from more than one category of weapons (e.g., a short-barreled machine gun). If a selected weapon falls into more than one type in Table 2-2.2, the hazard rating determined should be the higher hazard rating (worst case) based on the characteristics. The reviewer should refer to Volume 4, Appendix A for more information on the selected weapon system. Information in Appendix A is not all inclusive due to the number of available weapons on the market and just represents a sampling of the various types. The reviewer should research information on the internet or

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other sources for the weapon being applied for if it is not in the appendix. One good source on the internet to view is <http://world.guns.ru>.

The reviewer will evaluate Items 27 and 28 together. There is no correct answer for these inputs; each facility may have differing needs for spare weapons on-site, maintenance cycles, etc. The reviewer should be watching for anomalies in these two responses.

For example: If the applicant is applying for the M2HB .50 cal machine gun and plans to keep one hundred of these systems on site with seventy five normally in use, this should raise a “red flag” to the reviewer.

A reasonable answer to these inputs should help assure the reviewer that the applicant has done due diligence in researching the selected weapon system for their needs.

2-3: Ammunition for Selected Weapon		
Item Number	Descriptor	Rated or Non-Rated Element
29	Check all of the ammunition types below that are to be used with this weapon.	Rated Element

Table 2-3.1 Ammunition for Selected Weapon Item List

For this section the reviewer should:

1. Evaluate the ammunition types the applicant plans to use with the selected weapon system.
2. Examine intended weapon use to make sure it is logical. A stipulation may be required for acceptance of the application to limit the ammunition types for the requested weapons.

Reviewer Scoring:

1. The reviewer will assign a Hazard Rating to Item 29 in Table 2-12.1. The rating will be based on maximum range and ability to penetrate risk items. In the case of multiple ammunition types being selected, the reviewer should assign the highest Hazard Rating from the selected Ammunition Types. A suggested Hazard Rating table (Table 2-3.2) is provided on page 15.

Information for the reviewer to consider:

Other ammunitions can be used with some of the weapons listed but may require modifications to the weapon system. The applicant should supply adequate information on alternative ammunitions for the NRC to make an informed decision. If not, the reviewer should request additional information from the applicant.

If the applicant has entered alternate ammunition in Item 29, the reviewer should first decide if the ammunition is just a modification of the ammunition in the table; see examples below:

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- Match Grade and Long Range Ammunition is the same ammunition manufactured to higher standards to perform more consistently.
- Vendor naming differences; ammunition vendors try to separate their product from those of other vendors with innovative naming. Normally the cartridge size will indicate what is really being sold.
- Several weapons in Appendix A can use multiple ammunitions. Volume 4, Appendix A, Table A-1 lists the most common ammunitions used with the weapon systems.

Ammunition Types Description:

Ball Ammunition: This is the most common ammunition type. Generally this type of ammunition will have the longest range of any of the types of ammunition.

Tracer Ammunition: This ammunition is normally used as an aid in training exercises. Tracer ammunition is sometimes alternated with live ammunition (every 3rd or 4th round in a magazine or belt) to allow the shooter better visibility of the shot. It does not have the range of ball ammunition.

Frangible Ammunition: This ammunition is used to lessen the collateral damage of a round. Frangible ammunition may stop an adversary but may not cause massive damage to the surrounding equipment or structures. Frangible ammunition is designed to completely fragment on impact with the target. This ammunition is sometimes called 'no ricochet', 'reduced hazard ammunition' or 'the advanced energy transfer round'. Frangible ammunition is being used in many areas as a lead-free alternative to ball ammunition. Frangible ammunition is typically used inside buildings or around expensive equipment. It has a shorter range than ball ammunition.

Plastic Ammunition: This ammunition is used mostly for training purposes where the firing range is too short for ball ammunition or the range is operating as a lead-free facility. Plastic ammunition can be purchased in ball and tracer configurations. Plastic ammunition is also used for riot control since it is considered less-lethal at the proper distance. It has a much shorter range than ball ammunition.

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Armor Piercing Ammunition: This ammunition is for use against material targets. It is designed to penetrate materials that a normal ball round would not penetrate. If the applicant plans to use armor piercing ammunition, special attention should be given to analyzing potential structural damage (Fuel & Chemical Tanks, Generators, Hazardous Material Storage cabinets, etc.). An armor piercing round may pass through wood or concrete block walls depending on their construction.

Hollow Point Ammunition: This ammunition is designed to fragment on contact with a human target. This fragmentation produces additional damage and bleeding. Due to the shape of the round, hollow point ammunition tends to tumble in the air after traveling a short distance. This tumbling has two effects:

1. The round is less accurate at long distances.
2. The round does not have the range of a ball round.

Shotgun Ammunition: This ammunition is primarily for use against personnel. There are many types of shotgun ammunition available for various purposes. Most typical loads intended for use against personnel contain buckshot or larger birdshot. Shotgun ammunition containing slugs and other specialized materials are also effective against personnel. The effective range for shotgun ammunition varies between 20 and 70 meters. Refer to Appendix B in Volume 4 for additional information.

Other: An additional input area for the applicant was left for any “Other” ammunition types the applicant wants to use. These could be types like incendiary or Saboted Light Armor Penetrator (SLAP). The applicant should supply adequate information on “Other” ammunition types for the NRC to make an informed decision. If not, the NRC should address additional questions to the applicant.

Hazard Rating	Ammunition Type
0	Not used for this Rated Element
1	Plastic, Frangible, Shotgun Birdshot and Buckshot Rounds
2	Tracer
3	Hollow Point
4	Ball, Shotgun Slugs
5	Armor Piercing, Specialized Rounds

Table 2-3.2 Suggested Ammunition Type Hazard Ratings

The reviewer should refer to Vol. 4, Appendix A, Table A-1 and Appendix B and C for appropriate ammunition for a weapon system and ammunition characteristics and effects.

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2-4: WEAPONS DEPLOYMENT		
Item Number	Descriptor	Rated or Non-Rated Element
30	Check all types of deployment for the weapon.	Non-Rated Element
31	Additional description of weapon deployment ...	Non-Rated Element
32	Create Standard Range Cards.	Non-Rated Element
33	ROWS discussion	Non-Rated Element
34	Describe any pertinent training and describe the level of training.	Rated Element*

Table 2-4.1 Ammunition for Selected Weapon Item List

For this section the reviewer should:

1. Evaluate the types of deployment for the weapon.
2. Examine the description of the locations for the weapon deployment and the range cards. A stipulation may be required for acceptance of the application to limit the use of the requested weapons. Examine how the weapon will be carried, either by individuals or roving patrol (e.g., “locked in a rack” or “loaded with un-chambered round”, etc).

***Reviewer Scoring:**

The reviewer will not assign a numerical rating to item 34. The applicant is given weighted credit (risk reduction factors) for different levels of training in their assessment of items 38 through 42. The average risk levels are calculated as a mitigated risk level. Documentation for the training is a required submittal and should be reviewed.

Information for the reviewer to consider:

Weapon System Uses:

Machine Guns, depending on model and style:

- Can be used as ROWS.
- Can be used from fixed positions.
- Can be used as a patrol weapon.
- Can be used inside facility buildings. (Frangible ammunition recommended.)
- Can be used in many situations and areas of the property.

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Short Barreled Shotguns:

- Not normally used as a ROWS.
- Can be used from fixed positions.
- Can be used as a patrol weapon.
- Can be used inside facility buildings. (Frangible ammunition recommended.)
- Can be used in many situations and areas of the property.

Short Barreled Rifles:

- Not normally used as a ROWS.
- Can be used from fixed positions.
- Can be used as a patrol weapon.
- Can be used inside facility buildings. (Frangible ammunition recommended.)
- Can be used in many situations and areas of the property.

If the applicant checks the box “As a Remotely Operated Weapon System (ROWS) ...” for Item 30, then Item 33 should provide additional information on ROWS use.

NOTE: Remotely Operated Weapon Systems (ROWS) should be thoroughly evaluated by the reviewer. ROWS may be the appropriate system for the applicant’s situation, but the reviewer should evaluate the ROWS from a weapons safety point of view. (i.e., Can the remote operator see enough of the situation to make a valid fire/no fire decision? Can the operator see the entire area surrounding the target?) ROWS are typically used in a limited area and not fired in all directions and vertical planes (up, down, horizontal).

The best solution for limiting a weapon’s field of fire is to install a mechanical modification (limiters) to the weapon that restricts the weapon movement to only its intended field of fire. Another option is to put training and procedures in place to instruct the gunner about the weapon’s proper field of fire.

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2-5: MAP INFORMATION		
Item Number	Descriptor	Rated or Non-Rated Element
35	Provide any pertinent map comments or explanations:	Non-Rated Element

Table 2-5.1 Map Information Item List

For this section the reviewer should:

1. Review the maps and diagrams submitted by the applicant.

Reviewer Scoring: None

Information for the reviewer to consider:

The WSA guidance instructed the applicant to provide maps and facility drawings to illustrate risk items and support risk mitigations. If the applicant has selected to use a weapon from a fixed position/s, then a Standard Range Card should have been included for each fixed position.

2-6: INITIAL AREA DANGER RING		
Item Number	Descriptor	Rated or Non-Rated Element
N/A	Initial Area Danger Ring ...	Non-Rated Element

Table 2-6.1 Initial Area Danger Ring (IADR) Item List

For this section the reviewer should:

1. Review the IADR map submitted by the applicant.

Reviewer Scoring: None

Information for the reviewer to consider:

An IADR is designed to show the maximum potential distance a stray round could travel. The figure below shows the maximum range of three standard military rounds (ball ammo, see Vol 4, Appendix B, Table B-1). The reviewer can also refer to Volume 4 - Reference Documents: Ammo Trajectories.pdf, DA PAM 385-63, and DOE M470.4-3 Protective Force, Section B, II-7.

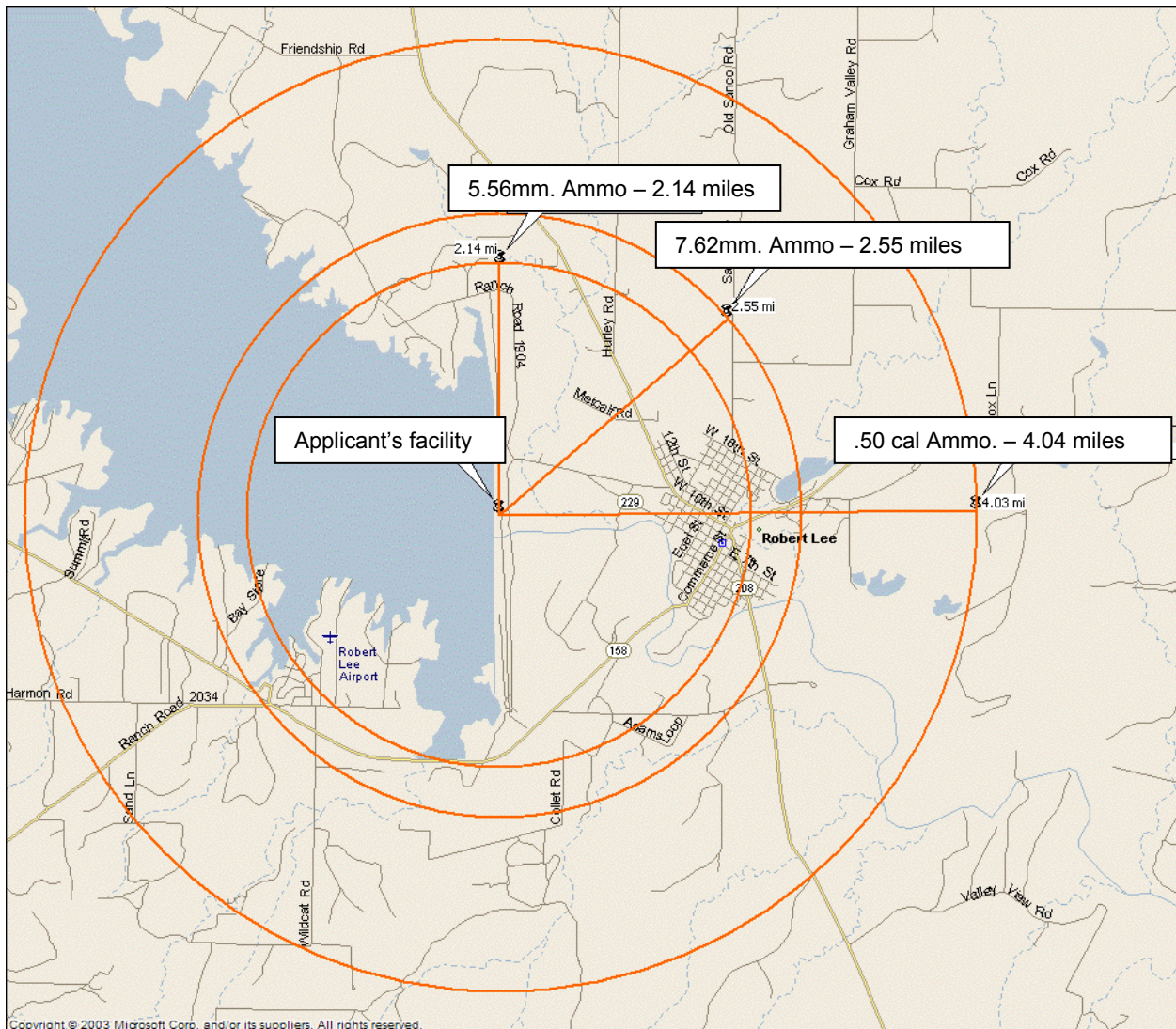


Figure 2-6.1 Maximum Ammunition Ranges for NATO standard ammunition (Ball Type)

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The applicant should have submitted an IADR map.

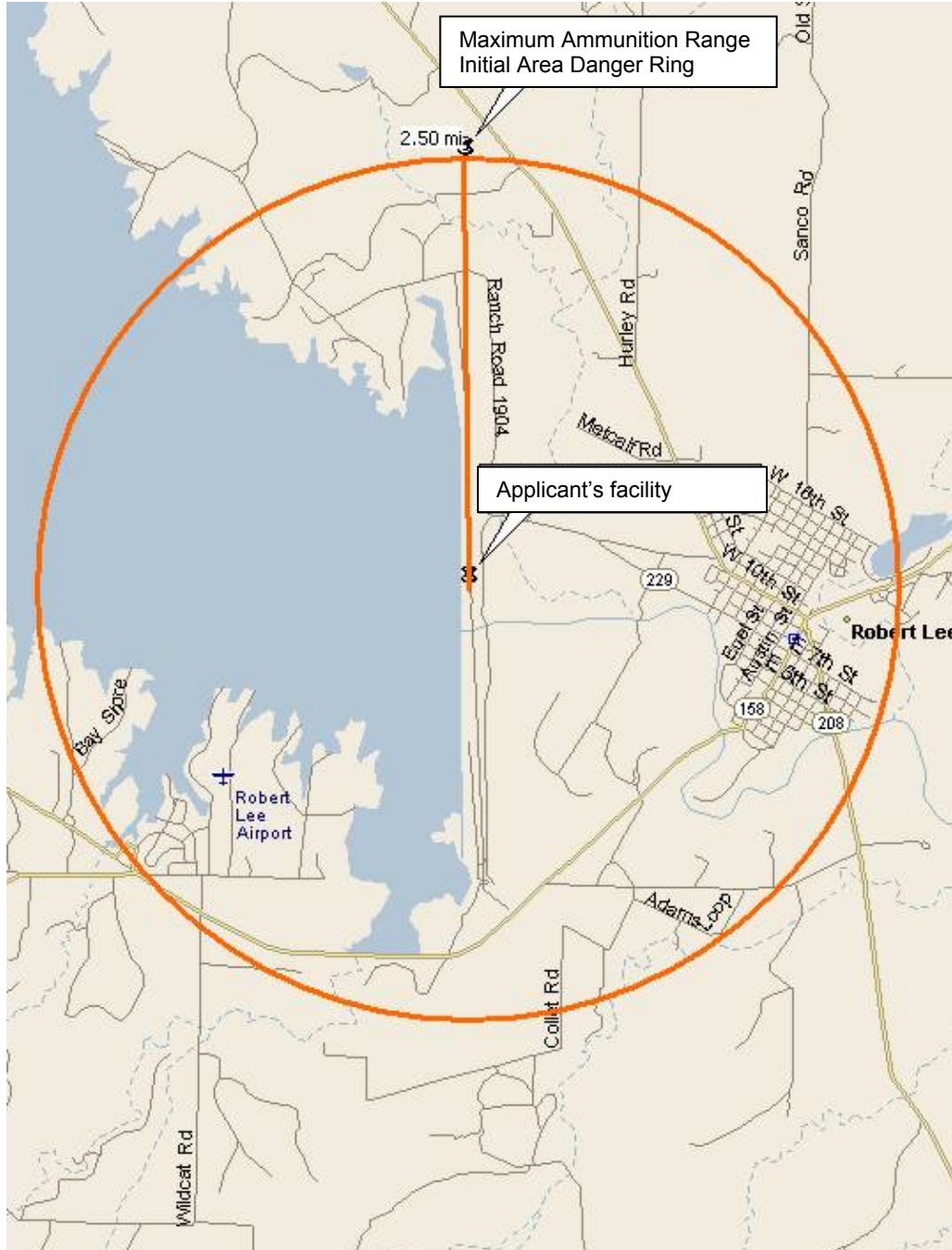


Figure 2-6.2 Simplified IADR for a single firing point – Map Drawing.

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2-7: PROPERTY BOUNDARY ASSESSMENT AND ENCROACHMENT ISSUES		
Item Number	Descriptor	Rated or Non-Rated Element
36	Enter the % of each type of boundary buffer or encroachment type that surrounds the facility. These percentages should equal 100%.	Rated Element
37	Describe any pertinent information pertaining to property buffer or encroachment areas.	Non-Rated Element

Table 2-7.1 Property Boundary Assessment Item List

For this section the reviewer should:

1. Evaluate the buffers and encroachments surrounding the facility.
2. Review any discussion from the applicant's input to Item 37.

Reviewer scoring:

1. The reviewer will assign a Hazard Rating to Item 36, in Table 2-12.1. The rating will be based on the total percentage of the facilities' boundary that is encroached upon. A suggested Hazard Rating table (Table 2-7.2) is provided below.

Information for the reviewer to consider:

The WSA Volume 2: Template generates a Risk Level and a total % encroachment for Item 36 based on the total percentage of the property boundary that is encroached.

Hazard Rating	Total % of Boundary Encroachment
0	0% - 16%
1	17% - 33%
2	34% - 50%
3	51% - 67%
4	68% - 84%
5	85% - 100%

Table 2-7.2 Suggested Percentage Encroachment Hazard Ratings

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2-8: RISK IDENTIFICATION, EVALUATION and MITIGATION		
Item Number	Descriptor	Rated or Non-Rated Element
38	Chemical and Petroleum/Fuels risks in the IADR ...	Rated Element
39	Key Facilities/areas Inside the Protected Area (PA)	Rated Element
40	Key Facilities/areas Outside the PA but on the facility's property ...	Rated Element
41	Key Facilities/areas Outside the Property Boundaries	Rated Element
42	Critical Asset items outside the Property Boundaries	Rated Element

Table 2-8.1 Risk Identification Item List

For this section the reviewer should:

1. Evaluate the risk items identified by the applicant.
2. Evaluate the applicant's justifications for Likelihood of Strike and Consequences of Strike.
3. Evaluate all maps and diagrams provided to illustrate risk items.
4. Evaluate mitigations taken for each risk item. Training factors are taken into account, but are not a substitute for physical mitigation measures.

Reviewer Scoring:

1. The reviewer will assign a Hazard Rating to Item 38, in Table 2-12.1. The rating will be based on the mitigated Risk Level in Item 38 of the Template. If the applicant has only met the training requirements in 10CFR73 Appendix B, they should have entered a zero for the reduction factor. This reduction factor also applies to tables in items 39 through 42. A suggested Hazard Rating table (Table 2-8.2) is provided on page 19.
2. The reviewer will assign a Hazard Rating to Item 39, in Table 2-12.1. The rating will be based on the mitigated Risk Level in Item 39 of the Template. A suggested Hazard Rating table (Table 2-8.2) is provided on page 19.
3. The reviewer will assign a Hazard Rating to Item 40, in Table 2-12.1. The rating will be based on the mitigated Risk Level in Item 40 of the Template. A suggested Hazard Rating table (Table 2-8.2) is provided on page 19.
4. The reviewer will assign a Hazard Rating to Item 41, in Table 2-12.1. The rating will be based on the mitigated Risk Level in Item 41 of the Template. A suggested Hazard Rating table (Table 2-8.3) is provided on page 19.

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- 5. The reviewer will assign a Hazard Rating to Item 42, in Table 2-12.1. The rating will be based on the mitigated Risk Level in Item 42 of the template. A suggested Hazard Rating table (Table 2-8.3) is provided below.
- 6. The reviewer will assign a Hazard Rating to Items 38 – 42 (Mitigation) in Table 2-12.1. The rating will be based on review of the types of mitigation identified in Item 38 through Item 42. A suggested Hazard Rating table (Table 2-8.4) is provided on page 20.

Information for the reviewer to consider:

For Items 38-42, review the Justification of the Likelihood & Consequence Levels, Mitigation Taken, Type of Mitigation and any Other Discussion provided for each at Risk Item. If any of these responses cause the reviewer to have further questions, they should be conveyed to the applicant in the form of a RAI. There may be risk items that need stipulations in order to be acceptable to the NRC. The reviewer should also be aware any manipulation techniques the applicant may try to lower their risk level by inputting lower risk levels for areas that may not be necessary, thereby lowering the overall risk average.

Hazard Rating	Mitigated Risk Level
0	≤1
1	>1 but <2
2	≥2 but <2.5
3	≥2.5 but <3
4	≥3 but <4
5	≥4

Table 2-8.2 Suggested Chemicals, PA and OCA Hazard Ratings

Hazard Rating	Mitigated Risk Level
0	≤1
2	>1 but <2
4	≥2 but <2.5
6	≥2.5 but <3
8	≥3 but <4
10	≥4

Table 2-8.3 Suggested Public Hazard Ratings

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Hazard Rating	Mitigation Discussion
0	No mitigating measures are required
2	All mitigating measures are related to the existing or enhanced nature of the target
4	Mitigating measures related to weapon range are based on positive physical measures
6	Mitigating measures related to weapon range are primarily based on positive physical measures
8	Mitigating measures related to weapon range are equally divided between procedural and positive physical measures
10	Mitigating measures related to weapon range are primarily procedural

Table 2-8.4 Suggested Mitigation Hazard Ratings

2-9: MITIGATED AREA DANGER RING MAP		
Item Number	Descriptor	Rated or Non-Rated Element
43	What is the estimated population density within the MADR	Rated Element
44	Is the population evenly distributed within the MADR	Non-Rated Element
45	If No, discuss population distribution.	Non-Rated Element

Table 2-9.1 MADR Items List

For this section the reviewer should:

1. Evaluate the applicant's MADR map.
2. Evaluate the population density within the MADR.

Reviewer Scoring: The reviewer will assign a Hazard Rating to Item 43, in Table 2-12.1. The rating will be based on the population density within the MADR. A suggested Hazard Rating table (Table 2-9.2) is provided on page 21.

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Information for the reviewer to consider:

The identification and mitigation of risks by the applicant should support the “shrinking” of the IADR to the MADR. When reviewing the MADR, correlation between the mitigative measures and the MADR should be obvious. If no mitigative measures are used other than procedural measures, then the limits of the MADR may coincide with the IADR. The reviewer should consider the population density around the applicant’s facility focusing on risk mitigation that protects highly populated areas.

weapon		5.56mm	7.62mm	.50 cal
range		2	2.5	4
area in ADR, sq miles		12.6	19.6	50.3
Hazard Rating	Population Density Inside Mitigated ADR (not including site personnel) People/Square Mile	Total Population in Initial ADR		
		0	≤2	≤25
1	>2 but ≤10	>25 but ≤126	>39 but ≤196	>101 but ≤503
2	>10 but ≤20	>126 but ≤251	>196 but ≤393	>503 but ≤1005
3	>20 but ≤100	>251 but ≤1257	>393 but ≤1963	>1005 but ≤5027
4	>100 but <500	>1257 but ≤6283	>1963 but ≤9817	>5027 but ≤25133
5	≥500	≥6283	≥9817	≥25133

Figure 2-9.2 Population Density table.

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The applicant should have submitted a MADR map. The MADR map may have a reduced footprint as illustrated in Figure 2-9.3 below.

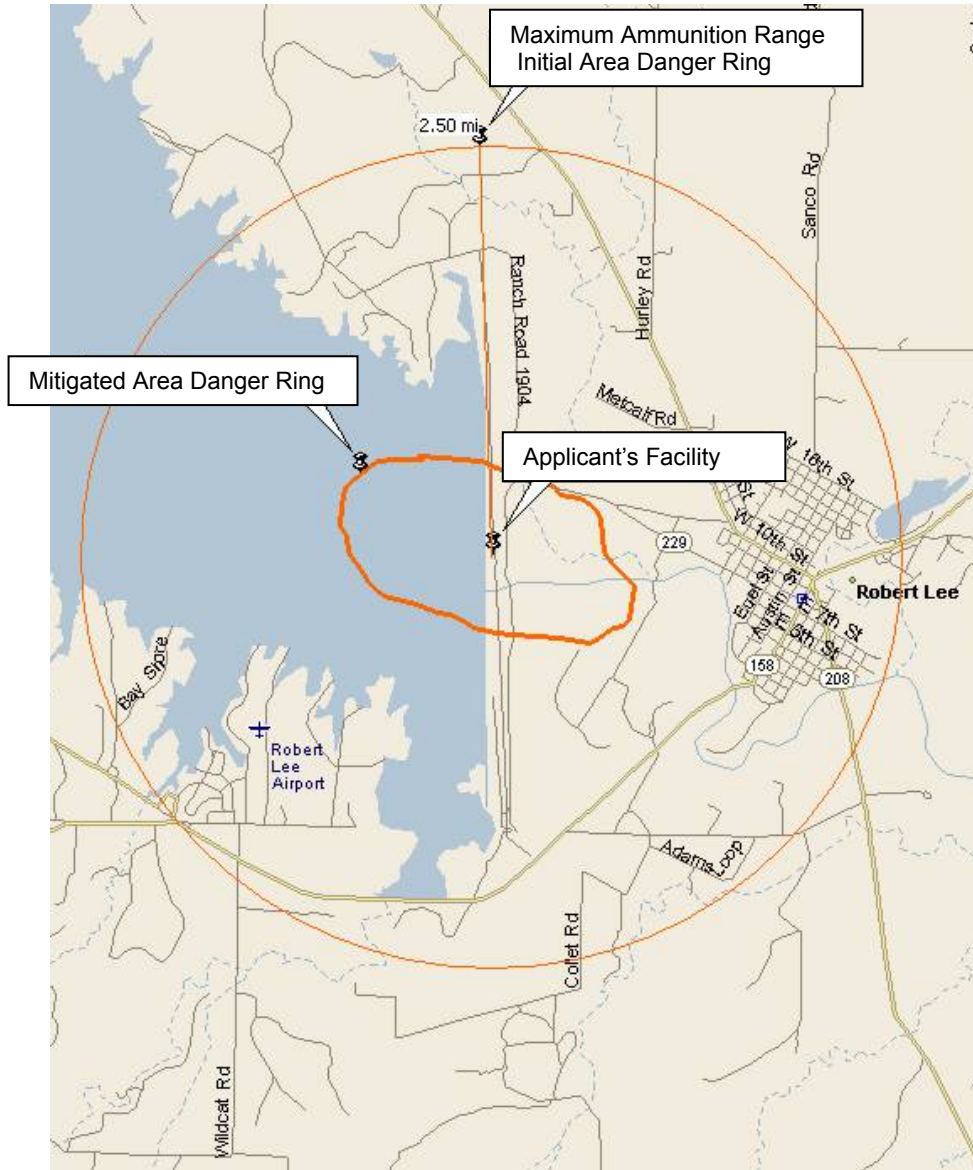


Figure 2-9.3 MADR Map.

The reviewer should refer to the MADR and any associated maps submitted by the applicant for Items 43-45.

2-10: TRAINING AND WEAPON MAINTENANCE

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Item Number	Descriptor	Rated or Non-Rated Element
46	Does the applicant have a firearms training range on their property where the enhanced weapons will be used?	Non-Rated Element
47	If Yes, will training for this enhanced weapon be on the facility's range? If the answer to item 47 is yes, items 47a and 47b must be answered...	Non-Rated Element
47a	Has the local FAA been contacted with regards to the training range and any requirements for SUA?	Non-Rated Element**
47b	Summarize discussion and provide POC information	Non-Rated Element**
48	Who uses the on-site firing range?	Non-Rated Element
49	If the existing range will not support training for this weapon, or if there is no range, have arrangements been made to train with this weapon at another location? ...	Non-Rated Element
50	What reference materials were used for modifying the existing training and weapon maintenance plans? ...	Non-Rated Element
51	If routine weapon maintenance and/or minor repair will not be done on site, discuss needed inventory levels to continue normal operations and support repair/maintenance shipping considerations. ...	Non-Rated Element

Table 2-10.1 Training and Weapon Maintenance Items

For this section the reviewer should:

1. Examine and make sure that an accepted training regime is proposed; if not, stipulate what should be used or what needs improvement.
2. Evaluate the applicant's capability to maintain and train with the selected weapon system.
3. Evaluate what materials the applicant used as sources for modifying weapon maintenance and training plans.
4. If the applicant answers YES to Item 46, the reviewer should evaluate the feasibility of training on the facility's property.

****Reviewer Scoring:** Item 47a is a non-rated element for the purpose of the reviewer assigning a hazard rating, however, it is the responsibility of the applicant to provide the information and a point of contact in item 47b if enhanced weapons will be used on the facility's range.

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Information for the reviewer to consider:

Machine Guns: These weapons require expansive ranges. An Army machine gun range will have targets out to 1500 meters (0.93 miles) for .50 cal weapons and 800 meters (0.50 miles) for smaller caliber weapons and have a width several hundred meters wide downrange. The land is contoured at these ranges to stop rounds from leaving the range.

Short Barreled Shotguns: These weapons do not require large ranges if the range is designed properly. The facility may have adequate space to train with these weapons on their existing range with minimal alterations. (The applicant would have to examine each facility on a site-by-site basis).

Short Barreled Rifles: Many facilities may already be training with these weapons on their own ranges. The facility may be able to train in full automatic mode at these ranges with minimum alterations. (The applicant would have to examine each facility on a site-by-site basis).

2-11: RISK ACCEPTABILITY		
Item Number	Descriptor	Rated or Non-Rated Element
52	The applicant has reviewed the risks associated with using this weapon and the selected ammunition(s).	Non-Rated Element

Table 2-11.1 Risk Acceptability Items List

For this section the reviewer should:

Check the applicant's response to Item 52.

Reviewer Scoring: None

Information for the reviewer to consider: None

If the applicant finds the Risks to be not acceptable, the reviewer should consult NRC management.

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2-12 Review Information

Date of Review:

Facility:

Applicant:

Weapon Selected:

Review Team Leader:
Review Team Member:
Review Team Member:
Review Team Member:
Review Team Member:

Reviewer Hazard Ratings	
ITEM 24 – WEAPON TYPE SELECTED:	Not Scored
COMMENTS:	
ITEM 29 - AMMO TYPES SELECTED:	Not Scored
COMMENTS:	
ITEM 36 - PERCENT ENCROACHMENT:	Not Scored
COMMENTS	
ITEM 38 - CHEMICALS:	Not Scored
COMMENTS	
ITEM 39 - INSIDE PA:	Not Scored
COMMENTS	
ITEM 40 - OUTSIDE PA BUT IN OCA:	Not Scored
COMMENTS	
ITEM 41 - OUTSIDE OCA:	Not Scored
COMMENTS	
ITEM 42 - . CRITICAL ASSETS:	Not Scored
COMMENTS	
ITEMS 38 – 42- MITIGATION:	Not Scored
COMMENTS	
ITEM 43 - POPULATION DENSITY IN MADR:	Not Scored
COMMENTS	

Table 2-12.1 Review Team Hazard Ratings

OCA = OWNER CONTROLLED AREA

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When the reviewer has completed assigning Hazard Ratings to all ten areas, sum the numbers beside each reviewer rating above. The total should fall between 0 and 65

Review Team Ratings sum =

Using this sum the reviewer determines an overall Hazard Rating for approving this submittal package.

Sum of Hazard Ratings	Reviewer Recommendation
≤10	Approve the request subject to stipulations identified.
>10 but ≤25	Recommend that additional mitigating measures be used and approve the request subject to stipulations identified.
>25 but ≤35	Require that additional mitigating measures be used to lower the sum of the Hazard ratings and have application resubmitted.
>35	Require that additional mitigating measures be used and/or different weapon system selected to lower the sum of the Hazard Ratings and have application resubmitted.

Table 2-12.2 Suggested Interpretation of Sum of Hazard Ratings

NOTE: Applicant will have to submit changes to the Security Plan and Training & Qualifications Plan for review and approval after receiving authorization to obtain enhanced weapons from the NRC.

A template safety evaluation report (SER) is included below. The actual SER may vary from this template.

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR SECURITY AND INCIDENT

RESPONSE

RELATED TO 10 CFR PART 73.18

WEAPONS SAFETY ASSESSMENT, ENHANCED WEAPONS

1.0 INTRODUCTION

This document is in response to APPLICANT request to use of WEAPON SYSTEM at the XXX FACILITY. The APPLICANT submitted a completed weapons safety assessment (WSA) package for this enhanced weapon system in MONTH YEAR.

2.0 APPLICABLE REGULATIONS AND GUIDANCE

2.1 Regulations

Recent changes to 10CFR73.19 allow holders of U.S. Nuclear Regulatory Commission (NRC) licenses/certificates to obtain enhanced weapons for use as part of their physical protection program with NRC approval. Part of the approval process is submittal for review and approval of a WSA, prepared by the applicant/certificate holder, which must demonstrate that the use of an enhanced weapon, or weapons, at a site will not cause undue risk.

As defined in 10CFR73.2, enhanced weapons are any short-barreled shotgun, short-barreled rifle, and machine gun. Enhanced weapons do not include destructive devices, including explosives or weapons greater than .50-caliber.

2.2 Guidance Documents

NRC guidance documentation listed here

3.0 TECHNICAL EVALUATION

The NRC staff has reviewed the applicant's WSA submittal package for XXXX Facility. The NRC used the WSA Volume 3: Review Criteria to evaluate the applicant's submittal. All documents provided in the submittal were considered in the evaluation process.

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3.1 License Conditions

The facility will be allowed an exemption to use the weapon system requested until MONTH YEAR, to allow completion of planned mitigation actions.

During this time period, the facility should implement training, procedures and other mitigation efforts to lessen the potential risk/s. If the facility has not implemented all mitigation measures at the end of this time period, the applicant will submit an updated WSA submittal package and cease use of the weapon system until NRC reviews the updated package.

Applicant will have to submit changes to the Security Plan and Training & Qualifications Plan for review and approval.

The facility will not begin using the weapon system at the facility until all responsible personnel have completed training for the new weapon system.

The facility may only use this weapon system in a manner consistent with the uses discussed in the WSA submittal and any documentation that accompanied it for review.

4.0 CONCLUSION

The NRC staff finds that APPLICANT’S request for this enhanced weapon system is acceptable and authorizes the applicant to begin use of the weapon system after all license conditions are addressed. There is reasonable assurance that the health and safety of the public will not be endangered by granting authorization of this enhanced weapon system. Granting the use of this enhanced weapon system with respect to the current Security Training and Qualifications Plan, will neither decrease the effectiveness of the XXXX Facility plan nor jeopardize the health and safety of the public or endanger security operations.

Principal Contributors:

Date:

DISTRIBUTION: (Electronic)