

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Washington Headquarters Service, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington, DC 20503.

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1. REPORT DATE (DD-MM-YYYY) 14042015	2. REPORT TYPE Master of Operational Studies Research Paper	3. DATES COVERED (From - To) July 2014 - April 2015
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4. TITLE AND SUBTITLE Preparing the Marine Corps for Operations on the Nuclear Battlefield	5a. CONTRACT NUMBER N/A
	5b. GRANT NUMBER N/A
	5c. PROGRAM ELEMENT NUMBER N/A

6. AUTHOR(S) Rummler, Peter, M, Major, United States Marine Corps	5d. PROJECT NUMBER N/A
	5e. TASK NUMBER N/A
	5f. WORK UNIT NUMBER N/A

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) USMC School of Advanced Warfighting Marine Corps University 3070 Moreell Avenue Quantico, VA 22134-5068	8. PERFORMING ORGANIZATION REPORT NUMBER N/A
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9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A	10. SPONSOR/MONITOR'S ACRONYM(S) N/A
	11. SPONSORING/MONITORING AGENCY REPORT NUMBER N/A

12. DISTRIBUTION AVAILABILITY STATEMENT
Unlimited

13. SUPPLEMENTARY NOTES
N/A

14. ABSTRACT
The Marine Corps does not currently adequately train and educate officers to conduct offensive operations on a nuclear battlefield. Training focuses almost completely on individual protective measures and does not address the tactical and operational employment considerations for the force. Current Marine Corps education does not sufficiently familiarize students with United States (U.S.) and adversary policy and capabilities affecting employment. This lack of familiarity leads to a capability gap within the Marine Corps when faced with a potential conflict with a nuclear armed opponent. It can also make a nuclear conflict more probable by emboldening an adversary that sees this gap as a weakness. However, this capability gap need not exist. This paper recommends that the Marine Corps incorporate training and education into existing exercises and the officer professional military education (PME) program.

15. SUBJECT TERMS
Nuclear Weapons, Training, Education, Deterrence, NBC, CBRNE

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 23	19a. NAME OF RESPONSIBLE PERSON Marine Corps University / School of Advanced Warfighting
a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified			19b. TELEPHONE NUMBER (Include area code) (703) 432-5318 (Admin Office)

United States Marine Corps
School of Advanced Warfighting
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Quantico, VA 22134

FUTURE WAR PAPER

TITLE:

*Preparing the Marine Corps for Operations on the Nuclear
Battlefield*

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF OPERATIONAL STUDIES

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AY 2014-15

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Approved: 

Date: 28 MAY 2015

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DISCLAIMER

THE OPINIONS AND CONCLUSIONS EXPRESSED HEREIN ARE THOSE OF THE INDIVIDUAL STUDENT AUTHOR AND DO NOT NECESSARILY REPRESENT THE VIEWS OF EITHER THE SCHOOL OF ADVANCED WARFIGHTING OR ANY OTHER GOVERNMENTAL AGENCY. REFERENCES TO THIS STUDY SHOULD INCLUDE THE FOREGOING STATEMENT.

Introduction

The Marine Corps does not adequately train and educate officers to conduct offensive operations on a nuclear battlefield. Current training focuses almost completely on individual protective measures and does not address the tactical and operational employment considerations for the force. Similarly, current Marine Corps education does not sufficiently familiarize students with United States (U.S.) and adversary policy and capabilities affecting employment. This lack of familiarity leads to a capability gap within the Marine Corps when faced with a potential conflict with a nuclear armed opponent. It can also make a nuclear conflict more probable by emboldening an adversary that sees this gap as a weakness. However, this capability gap need not exist. The Marine Corps can incorporate training on operations on a nuclear battlefield into existing exercises with little additional cost in time and resources. Additionally, education on the same subject can be incorporated into the Marine Corps professional military education (PME) program. Cost in time and resources can be minimized commensurate with other competing training requirements but still be effective. To provide a more capable force and eliminate the Marine Corps' current capability gap in fighting a nuclear armed opponent, the Marine Corps should train and educate officers on operating against a nuclear armed adversary.

The Problem Emerges

Since the end of the Cold War, the apparent likelihood of the Marine Corps conducting operations on a nuclear battlefield has seemed remote. The two largest nuclear powers, the United States and the Union of Soviet Socialist Republics (USSR), followed by Russia, entered into treaties to reduce the number of strategic nuclear weapons that they maintained.

Additionally, unilateral actions reduced the number of non-strategic nuclear weapons (NSNWs)

maintained by both countries.¹ President George H. Bush's Presidential Nuclear Initiative (PNI) of 1991 removed NSNWs from all naval forces, including the Marine Corps, leaving only strategic nuclear weapons in the U.S. Navy.² Soviet and then Russian Presidents, Mikhail Gorbachev and Boris Yeltsin, reciprocated with reductions of some types of NSNWs.³ Due to these treaties and initiatives the apparent possibility of nuclear conflict with America's most probable adversary at the time, the USSR and then Russia, decreased dramatically. When viewed through the Cold War Paradigm, which included a high risk of nuclear conflict with the USSR, the relatively small nuclear threat posed by other potential nuclear armed adversaries seemed minor in comparison, so the overall perceived threat was reduced. The perceived reduction in the nuclear threat resulted in the reprioritization of training time within the Marine Corps. Time that the Marine Corps previously spent training and educating officers for operations on a nuclear battlefield was reallocated to prepare for more probable non-nuclear threats.

The Marine Corps' emphasis of training for conflict with a non-nuclear armed adversary to the exclusion of practically all training to fight a nuclear armed adversary created a gap in capability. The Marine Corps is no longer fully prepared to fight a nuclear armed adversary like Russia, China, or North Korea. However, the risk created by this capability gap is not necessary. A small investment in training and education can fill the requirement to prepare for operating against a nuclear armed opponent with a small commitment of time and little, if any, increase in expense. This training should focus solely on officers to limit the expenditure of time and resources commensurate with other competing training requirements. Once trained, these officers would provide a knowledge base that could rapidly disseminate the information when the mission required. Whether acting as commanders or staff officers they would be better

prepared to lead in a nuclear environment. Most importantly, their recommendations and decisions might prevent the escalation of a conflict from conventional to nuclear in the first place.

Today the United States, and therefore the Marine Corps, faces a more complex nuclear environment than the one that existed during the Cold War. Now, more capable and more numerous nuclear armed potential adversaries exist. Each one of these potential adversaries has unique policies and goals. Recent events and policy shifts allow the identification of three of these potential U.S. adversaries: Russia, China, and North Korea. It is conceivable that United States could find itself in a conflict with any of these three countries. Therefore, as America's force in readiness, the Marine Corps should be prepared for operations against a nuclear armed adversary and prepare its officers accordingly.

Potential Adversary Policy

Russia

Although the 2010 U.S. Nuclear Posture Review (NPR) states that the United States and Russia are no longer adversaries,⁴ it is identified it as a potential adversary because of the recent Russian invasions of Ukraine and Georgia and subsequent denunciations of those acts by the United States. Additionally, in 2008, then Chief of the Russian General Staff, General Nikolay Makarov, demonstrated that Russia still considers the use of nuclear weapons against the United States an option when he stated that Russia maintained NSNWs as a hedge against the conventional superiority of NATO.⁵ Subsequently, after the Russian Invasion of Ukraine in 2014, Russian President Vladimir Putin reminded the world that Russia was a nuclear power.⁶ It is likely that he intended to intimidate the western powers, including the United States, into not responding by making this statement. Furthermore, United States' actions continue to indicate

that it views Russia as a potential threat by continuing to base approximately 180 NSNWs in Europe. This basing of NSNWs, a commitment to NATO, is against the objections of the Russians who believe that all nuclear weapons should be based on the territory of the country to which they belong.⁷ Based on these actions and statements the relationship that the United States has with Russia appears to be potentially adversarial despite the NPR statement.

Russian military strategy assigns two missions to its NSNW forces as stated by General Makarov. The first is a nuclear deterrence mission; the second is the use of nuclear weapons to counter a conventional threat to the state.⁸ The deterrence mission requires that nuclear weapons remain mission capable to deter nuclear aggression of an adversary. Russia develops an incentive to strike first if its capability to strike is about to be lost due to imminent nuclear strikes, conventional strikes, or passive measures such as missile defense systems becoming operational. The second mission implies that Russian doctrine allows the first use of a nuclear weapon to defend the state against a conventional attack. In 2010, Russia demonstrated the execution of this policy during Vostok 2010, a military exercise against a fictional opponent. During the exercise Russian forces used a simulated nuclear first strike against the opposing conventional force.⁹ Both missions have important ramifications if a conflict were to develop with Russia.

If a conflict with Russia were to erupt, U.S. Forces, likely including the Marine Corps, will be required to plan and execute military operations inside that country. The targeting of Russian combat capability will need to take into account the possibility of undermining Russia's perception that it retains the ability to maintain a credible strategic deterrence. Targeting of systems considered vital to this mission during a battle or campaign could trigger undesired escalation. These systems include intercontinental ballistic missiles (ICBMs), submarine

launched ballistic missiles (SLBMs) and strategic bombers and the forces that allow them to accomplish their missions.¹⁰ To complicate matters, the Russians also perceive NSNW as a vital part of their deterrence system.¹¹ This Russian perception exists because of the conventional superiority that NATO has achieved and that China is working towards. Targeting of NSNWs, their command and control, or their protective systems, such as an integrated air defense system, could trigger their use by presenting the Russians with a use or lose scenario. They might perceive attacks on their NSNWs and supporting forces as posing an existential threat. They might adopt this view because if they lose their ability to employ NSNWs they can no longer successfully defend the state against U.S. or Chinese conventional forces.¹²

It is probable that a conventional operation conducted against Russia would escalate to include nuclear weapons if it began to lose because Russia considers the use of nuclear weapons an option if confronted with a conventionally superior opponent. Possible loss of territory might trigger a nuclear response and could include territory that is not internationally recognized as part of Russia. The portion of Ukraine that Russia recently annexed is an example. A less obvious trigger for Russian use of NSNWs might be threatening the defeat of a portion of the Russian conventional ground forces because of the potential threat to the survival of the Russian state that would exist if those ground forces were lost. Using Ukraine as an example again, Russia, if faced with the loss of a significant portion of its conventional combat power, could employ nuclear weapons in an attempt to save those forces. Such a situation could easily occur if the U.S. were to use some combination of air power, ground maneuver, amphibious maneuver, and airborne operations to surround or cut the Russian conventional force's lines of communication.

China

China is identified as a potential adversary of the U.S. because of the current tensions that exist between the two countries. China's claims over Taiwan, portions of the East and South China Seas, recent cyber-attacks conducted against the U.S. Department of Defense (DOD), and rapid military modernization created these tensions.¹³ The military modernization, in particular, puts emphasis on anti-access area denial (A2/AD). The U.S. perceives China's A2/AD as a threat. To counter A2/AD the U.S. developed the Air-Sea Battle Concept to address an adversary employing these techniques.¹⁴ Neither the U.S. nor China are seeking a confrontation; both countries are taking steps to reduce tensions, but a competitive relationship currently exists between them that could turn adversarial under the right conditions.

China bases its nuclear weapons policy on deterrence and calls for maintaining the capability to launch a second strike if attacked with nuclear weapons. Unlike Russia and the U.S., which base deterrence on transparency, China sees ambiguity as enhancing its deterrence. China also maintains a no-first-use policy with regard to its nuclear weapons. It does not distinguish between strategic weapons and NSNWs. Officially, China's no-first-use policy is made without any qualification; however, the U.S. DOD 2014 *Annual Report to Congress on Military and Security Developments Involving the Peoples Republic of China* states that there are ambiguities in the policy. The report claims that the policy is not clear as to whether no-first-use applies to use on Chinese territory, demonstration strikes, high altitude detonations. It also questions the applicability of the policy if China's nuclear second strike capability or state were at risk.¹⁵ Finally, a lack of transparency with regard to China's nuclear forces adds further doubt as to what China might do in a crisis.¹⁶

The NPR's distrust of China's no-first use policy calls into question if it would adhere to hit in time of crisis. Since 1993, nuclear and conventional Chinese missile forces have existed under the same military command, the Second Artillery force.¹⁷ This combination of conventional and nuclear forces could make targeting conventional missile forces without damaging the nuclear forces difficult. China might decide to use its nuclear weapons before losing the capability to do so. China could also elect to use nuclear weapons first to prevent the loss of territory, particularly if the U.S. were assisting with the defense of Taiwan, which China views as part of its territory. Additionally, if the U.S. were to conduct any attacks that undermined the ability of the Chinese Communist Party (CCP) to stay in power the CCP might elect to use nuclear weapons to preserve its regime.

In the event of a nuclear conflict between the United States and China, it is likely that China would choose to target U.S. military forces and installations within range of intermediate and medium range ballistic missiles such as ships at sea and bases on Japan and Guam. The selection of such targets would have the potential to significantly impact U.S. conventional force capability and preserve the limited number of nuclear intercontinental ballistic missiles that China possesses for a counterstrike if the U.S. were to retaliate against a Chinese city. Also, the selection of closer military targets, particularly targets at sea, would decrease the likelihood of a U.S. retaliatory strike against a population center due to U.S. moral and ethical constraints to respond in kind. Thus, although China does not acknowledge the possession of NSNW, it is likely that some of its shorter range nuclear weapons would be used against tactical and operational targets.

North Korea

North Korea, the Democratic People's Republic of Korea (DPRK), is a current adversary of the United States. The Korean War ended with an armistice and no peace treaty exists between the two countries. Because of the ongoing threat that the conflict might erupt again, the United States has maintained conventional forces in South Korea as a counter. Furthermore, the NPR lists the DPRK as one of the countries at odds with the United States.¹⁸ Conversely, the DPRK claims that it developed its nuclear program to deter the United States which it considers to be hostile.¹⁹ Therefore, both the United States and the DPRK see each other as possible threats and adversaries.

Declaring itself a nuclear power in 2005, the DPRK became a potential nuclear threat to the U.S. Its first known test of a nuclear weapon occurred in 2006 and another higher yield test took place in 2009.²⁰ No evidence exists that the DPRK has operationalized its nuclear weapons, and it likely has few constructed. The DPRK, also has no reliable long range delivery system although it is attempting to develop that capability in the form of missiles, ships, and submarines.²¹

Due to the infancy of the DPRK nuclear program and the closed nature of its society, it is not surprising that little information is available on its nuclear weapons policy. The information that is available indicates that the DPRK has declared that its nuclear weapons are for deterrence and self-defense. Their policy makes no known distinctions between strategic nuclear weapons and NSNWs. The DPRK has also stated that it will not use nuclear weapons first.²² The DPRK likely assess that no-first-use is important to its policy because any use of a nuclear weapon in combat by their regime would probably incur a level of retaliation that would lead to the collapse of that regime.²³ However, no-first-use might not be a realistic expectation once conventional

combat begins to threaten regime survival due the lack of strategic depth afforded to the DPRK by geography. With regime survival at stake, it would probably use all weapons at its disposal, including nuclear. This means that U.S. conventional success might lead to facing nuclear retaliation on tactical formations.

Tactical formations are potentially the only targets that the DPRK would be able to strike in the event of conflict with the U.S. due to the range limitations of their current potential nuclear delivery systems. These nearby U.S. targets consist predominantly of military forces and their bases. If the DPRK is unable to manufacture a nuclear weapon small enough for a ballistic missile or aircraft then they would have no option other than transporting and detonating it via surface means, thus employing nuclear weapons against tactical targets on the battlefield or at sea.

United States Policy

U.S. nuclear weapons policy states that its nuclear weapons are for deterrence of nuclear attacks against the United States and its allies.²⁴ First use of nuclear weapons is not counter to U.S. policy, but any first use would take place only under “extreme circumstances to defend the vital interests of the United States or its allies and partners.”²⁵ The United States has also stated that it will not use its nuclear weapons against countries that are not nuclear powers, who are party to the Non-Proliferation Treaty, and who are in compliance with the treaty’s provisions.²⁶ This policy clearly allows the use of nuclear weapons when they are used against the United States and envisions limited situations that might require their use even if that is not the case. The conventional superiority the United States possesses today allows the it to put much less emphasis on first use of nuclear weapons than it did during the Cold War when Soviet conventional forces had a superiority.

While U.S. conventional overmatch allows it to put less emphasis on nuclear weapons, potential adversaries see the overmatch as generating their requirement to develop or retain nuclear weapons as a counter. U.S. conventional success in a conflict with Russia, China, or North Korea might lead to nuclear attacks to counter that success. In an attempt to limit escalation and increase the probability of the survival of the state, it is likely that a U.S. adversary would select military targets for a nuclear strike to limit collateral damage. The adversary would attack forces at sea, at high altitude, and in isolated ground locations to achieve this goal. The United States, if it chose to respond with nuclear weapons, would also seek to limit collateral damage. A nuclear strike on, or near, a population center would be politically, morally, and ethically unacceptable in this instance. The United States would almost certainly respond by choosing a military target far from civilian population centers, which might lead to a U.S. nuclear weapon used in close proximity to friendly forces.

Current U.S. nuclear response options include ICBM, SLBM, strategic bomber, or a dual capable aircraft (DCA) employing a NSNW.²⁷ Due to the nature of ICBMs and SLBMs it is unlikely that the United States would use them on a tactical or operational military target. The short time of flight of these weapons results in an adversary or adjacent nuclear power having only a short time to decide what the United States is targeting and thus risks further escalation. The United States would also probably seek to reserve ICBMs and SLBMs for a potential second strike if escalation occurs due to their survivability. Air delivered NSNWs are less likely to cause miscalculation by an adversary or adjacent nuclear power. Therefore, if the U.S. choose to use a NSNW it would likely be delivered by a strategic bomber or dual capable aircraft.^{28 29}

Why Prepare

The nuclear weapons policies of both the United States and its adversaries demonstrate that the potential exists for the Marine Corps to operate on a nuclear battlefield. The Marine Corps envisions the possibility of facing nuclear weapons and other weapons of mass destruction in *Marine Corps Vision and Strategy 2025*.³⁰ Furthermore, MCWP 3-37, MAGTF Nuclear Biological Chemical (NBC) Defense Operations identifies nuclear weapons as a “substantial threat to the MAGTF” and foresees an increased likelihood that the Marine Corps might face NSNWs on the battlefield in the future.³¹ If commanders and their staffs do not prepare prior to a conflict the Marine Corps assumes risk that could lead to the waste of the human and material resources and potentially lead to defeat. Fortunately, the knowledge the Marine Corps needs to operate on a nuclear battlefield exists. The United States developed it throughout the Cold War, and subject matter experts refine it today.³² The challenge becomes ensuring that the Marines who need the information have it provided to them through education and training prior to needing it.

How to Prepare

Preparations should be proportional to the low probability for nuclear conflict. Therefore, the Marine Corps should make no changes to doctrine, organization, material, leadership, personnel, or facilities when preparing because of the cost that would be incurred. Preparations should focus on training and education and be limited to officer training to further reduce cost by limiting the target population.

Some of this training and education can be adapted from what the U.S. Army already provides to its functional area (FA) 52, Nuclear and Counter Proliferation Officers. The Defense Threat Reduction Agency (DTRA) provides a multitude of courses on the subject at its Defense

Nuclear Weapons School, which could also serve as a source of information for a curriculum appropriate for a Marine Corps Officer.³³ But these sources of knowledge should not be used as an excuse to avoid training Marines on the subject. If a nuclear conflict were to erupt it is doubtful that the U.S. Army would be able to give up officers with the FA 52 specialty due to its inevitable involvement in the same conflict. Likewise, DTRA Consequence Advisory Management Teams (CMAT), another source of information would likely be fully employed at the combatant commander level. Even if a few of these subject matter experts were made available to the MEF, they would be too few to provide the level of training that would be required once a conflict began. So, while the U.S. Army and DTRA should be leveraged to develop a Marine Corps curriculum, they should not be used as a substitute for training Marines.

Of course, implementing training and education for Marine Officers will consume time, which is a valuable resource on its own. Consequently, the Marine Corps should reallocate only a small portion of time in officer training and education to the subject of nuclear conflict. However, the reallocation of even this small amount of time will lead to an exponential increase in preparedness because so little, if any, time is currently spent on this topic. Ultimately, by implementing this training and education the Marine Corps will mitigate the risk if it is called upon to fight a nuclear armed adversary.

Training

The Marine Corps outlines individual and unit training requirements in chemical, biological, radiological, and nuclear (CBRN) combat in MCO 3400.3G, CBRN Training Requirements and in MOS specific Training and Readiness Manuals.³⁴ These references focus on individual and CBRN defense functional area training but do not sufficiently address unit level tactics, techniques, and procedures (TTPs) for operating on a nuclear battlefield. They do,

however, provide references to the publications containing this information, and it is with this information that a commander and his or her staff should have more familiarity.³⁵ This information includes such items as unit dispersion, terrain shielding, contamination avoidance, and the calculation of battlefield effects of nuclear detonations.³⁶ While these considerations can be implemented into all types of training, the officer will benefit the most from integrating these considerations into a planning exercise.

Planning exercises should integrate nuclear planning considerations and allow members of the staff to learn their jobs without involving an entire unit thus saving time and other resources. For units in the operating forces, training units like Marine Corps Tactics and Operations Group (MCTOG), Marine Aviation Weapons and Tactics Squadron (MAWTS), Marine Corps Logistics Operations Group (MCLOG), or MAGTF Staff Training Program (MSTP), would conduct or facilitate execution of these exercises. For officers in PME schools and non-resident PME programs existing planning exercises should be modified to integrate nuclear battlefield considerations. By integrating nuclear scenarios into existing high intensity conflict planning exercises no special nuclear specific exercises have to be created and time can be saved. Lastly, conducting planning exercises should help to identify shortfalls across doctrine, organization, training, material, leadership, personnel, and facilities (DOTMLPF) that might not otherwise be recognized if the training had not taken place. By having a large group of individuals of various military occupational specialties (MOS) and experiences working together on a planning problem, beneficial ideas could emerge that might not have otherwise.

Education

Educating military officers on the requirements for operating on a nuclear battlefield is a prerequisite for effective training. In order to validate training requirements and allocate

resources, including time, leaders should understand what they are training for. Because Marine Basic School focuses primarily on tactical training, Marine officers should begin their formal education on the nuclear battlefield when they enter Expeditionary Warfare School (EWS) or an equivalent non-resident program and progress as they attend more advanced PME schools or complete non-resident PME throughout their career. This education should cover strategic policy and doctrine, nuclear weapons effects on personnel and equipment, and weapon delivery systems and capabilities. The student's synthesis of their MOS knowledge with their education would prepare them to solve problems that are not addressed by training. Policy and doctrine should form the basis of any education on nuclear weapons.

Because policy is usually derived from our political leaders, the Marine Corps PME system should teach this subject at Command and Staff College and the War College. Doctrine, as a predominantly military produced product, should be taught at EWS. Advanced ILE, The School of Advanced Warfighting (SAW), should focus on the operational implications of both policy and doctrine. Graduates of these schools would possess an understanding of both policy and doctrine that are vital at preventing unintentional escalation in a conflict and provide a lens for the proper implementation of training. For example, per the MCWP 3-37, attacking launch sites for nuclear weapons is a recommended active defensive measure.³⁷ However, if applied to a conflict with Russia, an understanding of Russian policy would alert an officer to the possibility that this might cause escalation. Additionally, a MAGTF might inadvertently escalate a situation by requesting the deployment dual capable aircraft to a theater when operating as a Joint Task Force headquarters. Even if the intended employment of such aircraft was purely conventional, a properly prepared officer would understand the implications and could avoid unintentionally shaping the battlefield to his disadvantage.

The education program should also include weapons effects on personnel and equipment. These effects are relatively well understood and the basics are contained in existing unclassified military publications. When a nuclear weapon detonates it produces seven types of effects that have significance on the battlefield: blast, thermal radiation, transient radiation, ionizing radiation, iodine poisoning, fallout, and electromagnetic pulse (EMP).³⁸ An understanding of these effects is necessary for units to continue to function effectively. Because they are constant and quantifiable, and therefore fundamental to tactical decision making, officers should be educated on these effects at EWS. Depending on how a nuclear weapon is used the physical effects of the detonation in the form of the blast and thermal radiation can clear or create obstacles. Transient radiation, ionizing radiation, iodine poisoning, and fallout can injure or kill troops during and after a detonation. If they are not properly protected, EMP can destroy or temporarily degrade electronics.³⁹ In the event of a nuclear conflict with Russia, China, or North Korea, nuclear detonations near friendly forces are possible. An understanding of these effects would enable the Marine Corps to develop and refine plans that accomplish the mission at the lowest risk during a nuclear conflict.

Conclusion

The Marine Corps must be prepared to fight and win in a conflict that involves the use of nuclear weapons by the United States or an adversary. Russia, China, and North Korea are all nuclear armed and potential adversaries. Their policies allow the employment of nuclear weapons, and these weapons could be used against the Marine Corps. U.S. policy also allows the use of nuclear weapons under limited conditions. Some of these conditions could require the employment of a nuclear weapons in close proximity to Marine Corps forces. To prepare for potential conflict with a nuclear armed opponent the Marine Corps should educate and train

officers to plan for and conduct operations in this type of environment. Training would provide sound TTPs and allow units to operate effectively. Education would provide officers with the knowledge they need to solve complex problems as they arise on the battlefield. By focusing this training and education on officers the Marine Corps develops the capability to rapidly disseminate the knowledge to all Marines when required, but it keeps the cost in time and resources to a minimum commensurate with the likelihood of the threat. Despite the end of the Cold War, a nuclear threat still exists and the Marine Corps should be prepared to operate against it if called upon.

Endnotes

¹ The term “non-strategic” is used interchangeably with the term “tactical” in reference to nuclear weapons not referred to as strategic in the U.S. Nuclear Posture Review (NPR). This paper identifies non-strategic nuclear weapons (NSNW) as those not identified as strategic by the Strategic Arms Reduction Treaty (START). U.S. Department of Defense, *Nuclear Posture Review Report*, April 2010, 27.

² US President, Initiative, “Presidential Nuclear Initiative, dated 27 September 1991,” *George Bush Presidential Library*, accessed 28 December 2014, <http://bush41library.tamu.edu/archives/public-papers/3438>

³ Brian Alexander and Alistair Millar, ed., *Tactical Nuclear Weapons* (Washington, DC: Brassey’s Inc. 2003), 173-181.

⁴ U.S. DOD, *NPR*, iv.

⁵ George Hudson and Evgeny Buzhinsky, “Influences on Russian Policy and Possibilities for Reductions in Non-Strategic Nuclear Weapons,” In *Tactical Nuclear Weapons and NATO*, ed. Tom Nichols, Douglas Stuart, and Jeffrey McCausland (Carlisle, PA: Strategic Studies Institute, 2012), 189.

⁶ Vladimir Putin, “Seliger 2014 National Youth Forum,” Excerpts from transcript of meeting with Seliger 2014 Forum participants. President of Russia, August 29, 2014. <http://eng.kremlin.ru/news/22864>

⁷ Jacob Kipp, “Russian Doctrine on Tactical Nuclear Weapons: Contexts, Prisms, and Connections,” In *Tactical Nuclear Weapons and NATO*, ed. Tom Nichols, Douglas Stuart, and Jeffrey McCausland (Carlisle, PA: Strategic Studies Institute, 2012), 116-117.

⁸ Hudson, 189.

⁹ Jacob W. Kipp, “Russian Doctrine on Tactical Nuclear Weapons: Contexts, Prisms, and Connections,” In *Tactical Nuclear Weapons and NATO*, ed. Tom Nichols, Douglas Stuart, and Jeffrey McCausland (Carlisle, PA: Strategic Studies Institute, 2012), 143-146.

¹⁰ Limitations on intercontinental ballistic missiles (ICBMs), submarine launched ballistic missiles (SLBMs), and strategic bombers are covered in the New Strategic Arms Reduction Treaty (START) ratified in 2011 by both the US and Russia. “START Treaty,” 8 April 2010.

¹¹ Hudson 189.

¹² Leonid Polyakov, “Aspects of the Current Russian Perspective on Tactical Nuclear Weapons,” In *Tactical Nuclear Weapons and NATO*, ed. Tom Nichols, Douglas Stuart, and Jeffrey McCausland (Carlisle, PA: Strategic Studies Institute, 2012), 155-162.

¹³ U.S. Department of Defense, *Annual Report to Congress: Military and Security Developments Involving the People’s Republic of China 2014*, 24 April 2014, 15, 26-41.

¹⁴ Air-Sea Battle Office, *Air-Sea Battle: Service Collaboration to Address Anti-Access & Area Denial Challenges*, May 2013.

¹⁵ U.S. DOD, *Report to Congress*, 28-30.

¹⁶ U.S. DOD, *NPR*, 5.

¹⁷ Yeaw, 57.

¹⁸ U.S. DOD, *NPR*, 3.

¹⁹ Terence Roehrig, “North Korea’s Nuclear Weapons Program: Motivations, Strategy, and Doctrine,” In *Strategy in the Second Nuclear Age*, ed. Toshi Yoshihara and James Holmes (Washington, DC: Georgetown University Press, 2012), 89-91.

²⁰ Roehrig, 81-96.

²¹ Roehrig, 81-96.

²² Roehrig, 81-96.

²³ Roehrig, 92.

²⁴ U.S. Department of Defense, *Quadrennial Defense Review 2014*, 4 March 2014, 13.

²⁵ President of the United States, *Fact Sheet: Nuclear Weapons Employment Strategy of the United States*, June 19, 2013, <http://www.whitehouse.gov/the-press-office/2013/06/19/fact-sheet-nuclear-weapons-employment-strategy-united-states> (accessed 27 October 2014)

²⁶ U.S. DOD, *NPR*, viii.

²⁷ The US distinguishes between strategic and NSNWs, defining NSNWs as those not covered by START.

²⁸ Dual capable aircraft include strategic bombers, F-15Es, variants of the F-16, and the F-35A block IV. Jeffrey Larson, “The Role of Non-Strategic Nuclear Weapons: An American Perspective,” In *Tactical Nuclear Weapons and NATO*, ed. Tom Nichols, Douglas Stuart, and Jeffrey McCausland (Carlisle, PA: Strategic Studies Institute, 2012), 339-342.

²⁹ The B-61 is the only NSNW currently in U.S. inventory. U.S. DOD, *NPR*, 27-28, 37-40.

³⁰ Headquarters U.S. Marine Corps, *Marine Corps Vision and Strategy 2025*, 12-13.

³¹ Headquarters U.S. Marine Corps, *MAGTF Nuclear, Biological and Chemical Defense Operations*, MCWP 3-37 (Washington, DC: U.S. Marine Corps, September 21, 1998), 1-2 to 1-3.

³² The Defense Threat Reduction Agency’s, Defense Nuclear Weapons School currently offers a variety of courses that would be beneficial to a Marine Officer wanting to learn more about operating on a nuclear battlefield. “Defense Threat Reduction University Radiological and Nuclear Training and Information Resources,” Defense Threat Reduction Agency, accessed 31 March 2015, http://www.dtra.mil/Portals/61/Documents/2015_catalog_final_8-22-14.pdf

³³ “Defense Threat Reduction University Radiological and Nuclear Training and Information Resources,” Defense Threat Reduction Agency, accessed 31 March 2015, http://www.dtra.mil/Portals/61/Documents/2015_catalog_final_8-22-14.pdf

³⁴ Commandant of the Marine Corps, *Chemical, Biological, Radiological, and Nuclear Defense Training Requirements*, MCO 3400.3G, December 7, 2011, 6, <http://www.marines.mil/Portals/59/Publications/MCO%203400.3G.pdf> (accessed December 28, 2014).

³⁵ Commandant of the Marine Corps, *CBRN*.

³⁶ Headquarters U.S. Marine Corps, *Erratum to MCRP 3-37.2B 3 August 2004, Nuclear Contamination Avoidance, FMFM 11-18* (Washington, DC: U.S. Marine Corps, September 9, 1994).

³⁷ Marine Corps Combat Development Command, *Multi-Service Doctrine For Chemical, Biological, Radiological, and Nuclear Operations, MCWP 3-37.1* (Quantico, VA: U.S. Marine Corps, 1 July 2011), 4.3 – 4.7.

³⁸ Marine Corps Combat Development Command, 1-11, A-8.

³⁹ Marine Corps Combat Development Command, 1-11, A-8.

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