



# **THE COUNTERFORCE CONTINUUM AND TAILORED TARGETING:**

**A New Look at United States Nuclear  
Targeting Methods and Modern Deterrence**

**Benjamin C. Jamison, Major, USAF**



**WRIGHT FLYER PAPERS**

## **Air Command and Staff College**

Col Lee G. Gentile, Jr., Commandant  
Col Christian Watt, Dean of Resident Programs  
Lisa L. Beckenbaugh, PhD, Director of Research  
Lt Col Shannon Cummins, Essay Advisor



Please send inquiries or comments to

Editor  
The Wright Flyer Papers  
Department of Research and Publications (ACSC/DER)  
Air Command and Staff College  
225 Chennault Circle, Bldg. 1402  
Maxwell AFB AL 36112-6426

Tel: (334) 953-3558

Fax: (334) 953-2269

Email: [acsc.der.researchorgmailbox@us.af.mil](mailto:acsc.der.researchorgmailbox@us.af.mil)

AIR UNIVERSITY

AIR COMMAND AND STAFF COLLEGE



# **The Counterforce Continuum and Tailored Targeting:**

***A New Look at United States Nuclear Targeting Methods  
and Modern Deterrence***

BENJAMIN C. JAMISON, MAJOR, USAF

Wright Flyer Paper No. 89

Air University Press  
Maxwell Air Force Base, Alabama

*Commandant, Air Command and Staff  
College*  
Col Lee G. Gentile, Jr.

*Director, Air University Press*  
Dr. Paul Hoffman

Accepted by University Press May 2022 and Published September 2022.

ISSN 2687-7260

---

*Project Editor*  
Gail White

*Illustrator*  
Catherine Smith

*Print Specialist*  
Cheryl Ferrell

Air University Press  
600 Chennault Circle, Building 1405  
Maxwell AFB, AL 36112-6010  
<https://www.airuniversity.af.edu/AUPress/>

Facebook:  
<https://facebook.com/AirUnivPress>

Twitter: <https://twitter.com/aupress>

and

LinkedIn: [https://www.linkedin.com/  
company/air-university-press](https://www.linkedin.com/company/air-university-press)

### Disclaimer

Opinions, conclusions, and recommendations expressed or implied within are solely those of the author and do not necessarily represent the views of the Department of Defense, the Department of the Air Force, the Education and Training Command, the Air University, or any other government agency. Cleared for public release: distribution unlimited.

This Wright Flyer paper and others in the series are available electronically at the AU Press website: <https://airuniversity.af.edu/AUPress/Wright-Flyers/>.



## Contents

<b>List of Illustrations</b>	<i>iv</i>
<b>Foreword</b>	<i>v</i>
<b>Acknowledgements</b>	<i>vi</i>
<b>Abstract</b>	<i>vii</i>
<b>Introduction</b>	8
<b>Literary Review</b>	11
<b>Methodology and Doctrinal Guidance</b>	15
<b>Main Findings and Analysis</b>	18
<b>Recommendations and Conclusion</b>	30
<b>Abbreviations</b>	35
<b>Bibliography</b>	36

## **Illustrations**

### *Figures*

<b>1. United States Deterrence</b>	<b>21</b>
<b>2. Counterforce Continuum</b>	<b>21</b>
<b>3. Example Tailored Targeting Attack using CNI</b>	<b>22</b>
<b>4. 15 kiloton Nuclear Blast on a Notional Critical Target</b>	<b>23</b>
<b>5. Example Counterforce Continuum of Tailored Targeting Strategies</b>	<b>25</b>
<b>6. 1.5 kiloton airburst over Boca Chica Field, Key West, Florida.</b>	<b>28</b>
<b>7. 1.5 kiloton surface detonation on Boca Chica Field, Key West, Florida.</b>	<b>28</b>
<b>8. 15 kiloton airburst detonation over Boca Chica Field, Key West, Florida</b>	<b>29</b>
<b>9. Tailored Targeting</b>	<b>30</b>

## Foreword

It is my great pleasure to present another issue of the Wright Flyer Papers. Through this series, Air Command and Staff College presents a sampling of exemplary research produced by our resident and distance-learning students. This series has long showcased the kind of visionary thinking that drove the aspirations and activities of the earliest aviation pioneers. This year's selection of essays admirably extends that tradition. As the series title indicates, these papers aim to present cutting-edge, actionable knowledge—research that addresses some of the most complex security and defense challenges facing us today.

Recently, the Wright Flyer Papers transitioned to an exclusively electronic publication format. It is our hope that our migration from print editions to an electronic-only format will foster even greater intellectual debate among Airmen and fellow members of the profession of arms as the series reaches a growing global audience. By publishing these papers via the Air University Press website, ACSC hopes not only to reach more readers, but also to support Air Force-wide efforts to conserve resources.

Thank you for supporting the Wright Flyer Papers and our efforts to disseminate outstanding ACSC student research for the benefit of our Air Force and warfighters everywhere. We trust that what follows will stimulate thinking, invite debate, and further encourage today's air, space, and cyber warfighters in their continuing search for innovative and improved ways to defend our nation and way of life.



LEE G. GENTILE, JR.  
Colonel, USAF  
Commandant

## **Acknowledgements**

I wish to thank Maj Jannel Black, Maj Jeffrey Spinney, Maj Jake Waddy, and Maj Roni Yadlin for their thoughtful comments and suggestions.



## **Abstract**

This research paper analyzes counterforce and countervalue as targeting strategies to determine if these concepts remain relevant to modern deterrence. Along with this analysis, this research paper recommends an updated construct for both targeting methodologies and proposes a new term for the deterrence lexicon: tailored targeting. This research paper concludes that countervalue deterrent threats are no-longer credible for the United States and the model of counterforce targeting requires modification. Tailored targeting is a concept that matches adversary vulnerabilities and American political objectives to produce a unique targeting solution. When paired with a deliberate strategic messaging strategy, tailored targeting provides the President with a credible deterrent threat. A strategy of multiple tailored targeting solutions for various contingencies creates a continuum of effective deterrent options along the entire spectrum of conflict

## Introduction

*“The difference, of course, between the debate over the nature of thermonuclear war and previous such debates is that it remains hypothetical. And unless we want to bet everything on the optimist, that is what it will always be. For if we lost this bet, and the pessimist turned out to be right, a thermonuclear war will have destroyed the human race, and along with it things like discourse and memory. The debate would remain forever unresolved, because those pessimists proven right, along with those optimists proven wrong, would all be dead.”<sup>1</sup>*

—Campbell Craig, *Destroying the Village*

Nuclear weapons fundamentally changed the way nations think about targeting. The strategic bombing campaigns of World War II lacked the precision, intelligence, and battle-damage assessment capabilities required to make the promise of a quick victory through air power a reality. Nuclear weapons provided the pure destructive capability to make these theories more applicable; however, the delivery of these awe-inspiring weapons remained largely imprecise for the duration of the Cold War. In part to overcome the accuracy issues, nuclear targeting planned to employ the largest yield weapons available on enemy cities; this became known as countervalue targeting. Eventually, a second targeting strategy, counterforce, emerged as an option to avoid targeting civilian populations and instead target adversary nuclear forces.<sup>2</sup> As a general concept, if a state is the first to employ nuclear weapons, a counterforce targeting strategy designed as a disarming first strike is the most advantageous approach. In contrast, if the state is responding to a nuclear attack, it ought to use a countervalue targeting strategy as a retaliatory response.<sup>3</sup> While these two approaches have evolved since the Cold War, they remain the foundation of nuclear targeting. With technological advances in the form of precision delivery and low-yield nuclear weapons, and the distinctly different geopolitical climate of 2021 compared to the height of the Cold War, it is time to reevaluate these targeting strategies.

This research paper analyzes counterforce and countervalue as targeting strategies and determines if these concepts remain relevant to modern deterrence. Along with this analysis, this paper recommends an updated construct for both targeting methodologies and proposes a new term for the deterrence lexicon: *tailored targeting*. The concept of tailored targeting will complement the concept of tailored deterrence while also assisting policy makers and military strategists in applying nuclear deterrence along the entire spectrum of

conflict from the grey zone to general nuclear war. The concept of a counter-value strike is no longer credible in modern American nuclear deterrence and counterforce needs modification; to this end, this paper demonstrates that a holistic counterforce targeting strategy remains valid only if revised and proposes a new way to conceptualize tailored nuclear targeting to deter aggression along the entire spectrum of conflict.

Air Force Global Strike Command (AFGSC) proposed this question to the School of Advanced Nuclear Deterrence Studies as a research topic and asked if the propagation of liberal democracies across the world and the growing strength of the nuclear taboo has changed international opinion to such an extent that countervalue is no longer a viable means of nuclear targeting.<sup>4</sup> As such, AFGSC is questioning if the idea of a countervalue strike is still credible and if it still holds any deterrent value. Finally, AFGSC posits that the United States ought to disassociate the idea of a counterforce strike from that of a first strike.

In response to AFGSC's inquiries, this research paper examines and answers the following questions: Is countervalue still an appropriate targeting strategy that provides a credible and meaningful deterrent? Is it time to disassociate the idea of counterforce from the idea of a first strike option? Is counterforce still a valid targeting method and does it still provide an effective deterrent? Does the United States need an additional targeting method to achieve a credible deterrent at lower levels of conflict?

To answer the above questions, chapter two examines the history of different targeting strategies. Chapter three then discusses the methodology used for this analysis and presents some of the current doctrinal guidance for nuclear targeting. Chapter four begins with an examination of the historical foundations behind countervalue and counterforce. Conceived during the Cold War, technological advances and shifting international norms have changed the utility of both traditional nuclear targeting paradigms. After examining the history of countervalue and counterforce, chapter four discusses the problems facing both targeting models. These include the political unpalatability of a countervalue strike due to the tremendous cost in human life and the difficulty in messaging a counterforce attack as different from a countervalue attack.<sup>5</sup>

After presenting the history and current problems with counterforce and countervalue, chapter four demonstrates that countervalue targeting still provides a credible deterrent, but only in the specific circumstance of an assured retaliation nuclear posture.<sup>6</sup> Several nuclear states, including China, maintain a relatively small, but highly survivable, nuclear force. These types of nuclear forces often include weapons best suited for countervalue strikes, intended to deter nuclear aggression and coercion.<sup>7</sup> However, for the United States, a

countervalue targeting strategy is no longer credible and, therefore, has no utility for American deterrence goals.

Having demonstrated the obsolescence of countervalue for American deterrence, chapter four turns to counterforce, arguing that advances in technology provide continued utility to counterforce targeting as a deterrent strategy. Specifically, weapon accuracy and low-yield options offer policy makers and war planners a broad spectrum of potential nuclear targeting options.<sup>8</sup> Counterforce nuclear targeting requires further specificity, similar to how John Warden conceptualized targeting with his five-ring model.<sup>9</sup> This specified version of counterforce targeting is no longer synonymous with a massive preemptive disarmament strike but is instead a continuum of targeting options that spans from a localized strike to achieve a limited objective all the way to a massive retaliatory attack. For the purposes of this paper, accurate and precision guided weapons are any delivery system that reduce the circular error probable of a nuclear weapon to that of a Joint Direct Attack Munition.<sup>10</sup> This paper will demonstrate how accurate and low-yield nuclear weapons provide war planners and senior leaders with expanded options for counterforce nuclear targeting, making American nuclear deterrent threats credible.

With the proposed revisions to counterforce introduced, chapter four presents an argument for the concept of tailored targeting. The United States needs accurate and low-yield nuclear capabilities that provide policy makers with *usable* nuclear options.<sup>11</sup> Rigid pre-planned nuclear targeting schemes that carry a significant risk of escalation, or that are not proportional response options, do not provide the President with usable choices. This is a controversial position as usable nuclear weapons and usable nuclear plans are often associated with lowering the nuclear threshold and promoting nuclear warfighting; this is not the intent of this paper nor this new targeting proposal. Tailored targeting provides the capability to hold high value targets at risk without incurring significant collateral damage or requiring a large conventional strike; it provides the President with deterrent options that match adversary capabilities along with proportional options should deterrence fail. Tailored targeting would allow the United States to message capability, build credibility, and limit the likelihood of escalation.

After discussing the merits of tailored targeting as a concept, the end of chapter four addresses several counterarguments and demonstrates the real world applicability of this targeting method. Using the works of Samuel Glasstone and NUKEMAP, chapter four strengthens the case for accurate nuclear weapons by demonstrating their utility against notional targets.<sup>12</sup> Tailored targeting provides a credible nuclear deterrent threat because it expands the

available weaponeering solutions for strategic planners; however, it also requires a clear messaging strategy.

Messaging is one of the most critical components in creating a credible tailored targeting threat.<sup>13</sup> The United States joint doctrine outlines the essential need for “integration of nuclear weapons employment with ongoing conventional operations”; otherwise known as conventional nuclear integration (CNI).<sup>14</sup> The United States needs to demonstrate its ability to integrate conventional and nuclear operations. This paper provides a potential path for nuclear planners to use CNI to incorporate and exercise the flexible and tailored deterrent options outlined in joint doctrine. While CNI is far from a new concept, chapter five argues that the United States needs to exercise CNI with live fly assets to create a credible message. This is a logical extension of the already successful bomber task force (BTF) missions AFGSC has recently employed. Integrating nuclear forces with a conventional strike force will provide valuable training for AFGSC Airmen and signal that America has a credible CNI deterrent capability. Demonstrating capability allows American leadership to issue credible nuclear threats and message a strong nuclear deterrent.

In conclusion, chapter five discusses how to take the counterforce continuum and tailored targeting from concept to application using wargames and military exercises. This targeting strategy would provide the national command authority, policymakers, and military planners with a highly tailorable option to message American deterrent threats. Credible tailored deterrence requires a spectrum for counterforce targeting, the removal of countervalue targeting for the United States, and a new concept of tailored targeting.

## **Literary Review**

The following is not an all-encompassing review of the sources used for this research paper; however, it does encapsulate the foundational sources used in the analysis, synthesis, and conclusions. Tailored deterrence and military targeting strategies are not unique topics, but the literature does offer a fertile landscape for the concepts of a counterforce continuum along with the idea of tailored targeting.

Campbell Craig’s seminal work, *Destroying the Village*, presents a thorough analysis of the development of American nuclear strategy.<sup>15</sup> Craig argues that President Eisenhower’s policy of massive retaliation worked. He discusses how Eisenhower developed the strategy based on his interpretation of Clausewitz’s “maximums” for warfare. Eisenhower did not have any nuclear deterrence theory or historical examples and had to create a strategy at the dawn of the thermonuclear and Intercontinental Ballistic Missile (ICBM) age. Craig

contends that when President Kennedy took office and developed a policy of flexible response, the principles of massive retaliation did not disappear. Despite the stated policy of flexible response, Kennedy navigated the third Berlin Crisis and the Cuban Missile Crisis using a policy of avoiding war in a way that was akin to Eisenhower.

Craig's work demonstrates that the origins of American nuclear strategy, including the ideas of countervalue and counterforce, were derived without the benefit of historical context or fully formed deterrence theory. While the United States publicly discussed different targeting strategies, Craig's argument shows that these ideas were neither fully developed nor operational.

Next, Desmond Ball and Jeffery Richelson discuss in *Strategic Nuclear Targeting* how none of the pre-1970s nuclear strategies examined targeting effects.<sup>16</sup> The authors scrutinize the paradox of using a tightly controlled nuclear targeting strategy that relies heavily on command and control (C2) in an environment where the C2 network might not survive an initial attack. They examine the problems with counterforce targeting against Russia, where numerous missile silos are located close to large population centers. This makes a counterforce strategy difficult to message; a counterforce attack looks the same to Russia as a countervalue attack. Ball and Richelson also consider the problems with a decapitation strategy, again due to the number of weapons required and their colocation with urban centers.

Expanding on some of the challenges with nuclear targeting, Donald Cotter discusses nuclear command and control on the spectrum of peace to war in *Peacetime Operations*.<sup>17</sup> Since 1945, the United States has only operated nuclear weapons in a peacetime environment. The next step on the continuum of conflict is the command system at the brink of war. Cotter argues that—other than the Cuban missile crisis—the United States has never operated in this environment. He contends that the transition from peacetime to wartime control will not be seamless.

Cotter believes that a massive attack is essentially national suicide and, therefore, a limited attack is both more realistic and more difficult to deter. In a limited nuclear war, an enemy's nuclear C2 network is a risky target due to its likelihood to escalate the conflict. This suggests that when developing targeting solutions, striking C2 capabilities, depending on the adversary, is potentially detrimental in a limited conflict.

Finally, as part of the examination of the continued validity of countervalue, Vipin Narang's *Nuclear Strategy in the Modern Era* presents three different nuclear postures that states maintain.<sup>18</sup> Narang argues that examining nuclear postures is more predictive than interpreting their public policy or statements.<sup>19</sup> His assured retaliation posture demonstrates when a countervalue targeting

strategy remains credible. China, for example, has maintained a consistent assured retaliation posture since first acquiring nuclear weapons in the 1960s. Their arsenal exclusively includes large megaton and inaccurate weapons that are best suited for a countervalue targeting strategy.<sup>20</sup> Narang presents a compelling case for why countervalue, while no longer relevant for American deterrence, remains a valid targeting strategy for other nuclear states.

The previous literature focused exclusively on nuclear targeting; however, developing a more nuanced nuclear targeting methodology also requires evaluation of conventional targeting strategies. Robert Pape in *Bombing to Win* presents several different approaches for targeting.<sup>21</sup> He outlines four main strategies for coercion: punishment, risk, denial, and decapitation.<sup>22</sup> Punishment strategies intentionally target civilian populations. Risk strategies also target civilian populations but spread the damage out over time and use increasing punishment levels as a coercive lever. A denial strategy targets military forces directly and, lastly, a decapitation strategy targets leadership and communication with the goal of achieving strategic paralysis.<sup>23</sup>

Pape, who wrote *Bombing to Win* before precision munitions were prevalent, argues that the best option for nuclear weapons is to use countervalue targeting as a punishment strategy.<sup>24</sup> A risk strategy might use countervalue or counterforce targeting to incrementally increase escalation until the adversary acquiesces. A counterforce first strike is a denial strategy. Finally, decapitation is the least viable option for a nuclear targeting strategy due to the unavoidable cost in collateral damage. As currently structured, nuclear targeting is unlikely to achieve strategic paralysis, demonstrating the need for a novel nuclear targeting structure.

John Warden proposed a targeting methodology using concentric rings, starting with leadership and moving outward to organic essentials, infrastructure, population, and fielded forces. His concept was to attack different rings in the enemy system to achieve the desired effect. Along with his five rings, Warden proposed targeting strategies along the continuum of his five-ring model to achieve coercion, incapacitation, or annihilation.<sup>25</sup> Pape and Warden provide a historical context for a counterforce continuum of tailored targeting options.

Mark Gallagher and Justin Sorice, in *Considering Alternative Nuclear Strategies*, assert that the current United States nuclear targeting strategy is problematic.<sup>26</sup> Their primary argument is that a counterforce strategy requires too many weapons and that continued reduction in the United States' stockpile will drive America to a countervalue strategy. A countervalue strategy that holds enemy civilian populations at risk, the authors argue, is not credible since America is unlikely to use its nuclear arsenal against civilian popula-

tions. If there is little chance that the United States would use its nuclear weapons as dictated in our current strategy, then we lose our credible threat. The authors propose that the United States conform its nuclear targeting strategy to the Just War Doctrine. They argue that any credible nuclear targeting strategy must have practical utility. Where this article falls short is in proposing any new solutions. The authors suggest the possibility of counter-economic and counter-leadership strategies, but they never discuss a specific proposal for how to implement a new targeting strategy. This argument presents strong evidence for why countervalue is no longer a credible targeting strategy for the United States and why counterforce requires revision.

Finally, there are literary sources that support a counterforce continuum and tailored targeting. Brad Roberts' *The Case for Nuclear Weapons in the 21st Century* claims that the United States needs to look at tailored options for deterrence.<sup>27</sup> He contends that the United States must provide the President with choices in the form of low-yield weapons. Tailored deterrence and low-yield weapons provide national command authority with usable nuclear options, creating credible threats that bolster American deterrence.<sup>28</sup>

Paul Bracken's *The Second Nuclear Age* argues that the United States must start thinking through the problems of fighting a nuclear war in advance or risk stumbling into a disaster unprepared.<sup>29</sup> Bracken also discusses the technology and strategy lag that occurs between nuclear weapons and conventional capability.<sup>30</sup> His example is how cruise missiles were initially developed for nuclear weapons, but it took twenty years before they were used for long range conventional precision strikes.<sup>31</sup> This argument also works in reverse for precision guided weapons, which are ubiquitous in the United States' conventional inventory, but remain almost non-existent in the nuclear inventory. Finally, Bracken believes the United States must start "thinking about the unthinkable."<sup>32</sup> He contends that the United States needs to begin seriously war gaming nuclear conflicts. America cannot afford to assume that the worst will not happen or that once a conflict goes nuclear it will spiral out of control. If the United States does not prepare for limited nuclear strikes in a conflict now, it will guarantee that America will stumble into a conflict unprepared.

Matthew Kroenig, in *The Logic of American Nuclear Strategy*, discusses how nuclear superiority allows the United States to push escalation and brinksmanship further than its adversaries.<sup>33</sup> His Superiority Brinksmanship Synthesis Theory supports the argument for tailored targeting.<sup>34</sup> American nuclear superiority allows the United States to message, or employ, a limited nuclear strike without risking escalation. China, for example, is unlikely to respond to a limited nuclear strike with a full-scale nuclear retaliation be-



cause the United States would survive the attack and would counter with a devastating nuclear attack of its own.

Finally, Keir Lieber and Daryle Press's *The Myth of the Nuclear Revolution* discusses that deterring conventional attacks with nuclear weapons is only possible if a state possesses usable nuclear weapons along with flexible escalation options.<sup>35</sup> The authors postulate that states that are conventionally inferior and are at risk of suffering a catastrophic defeat have increased motivation to use coercive nuclear escalation (CNE) tactics.<sup>36</sup> They examine case studies to demonstrate that states with a conventional vulnerability—particularly China, Pakistan, and North Korea—are more likely to have CNE forces than countries like the United States and Israel, which are conventionally superior. Russia currently uses CNE forces to counter the conventionally superior United States, which does not have a CNE force.<sup>37</sup>

The authors argue that power politics and nuclear weapons are not going away. They conclude that nuclear weapons are the greatest deterrent force ever devised and that they do make the world a safer place; however, stalemate and stability are not a guarantee. It takes a significant amount of effort to achieve a nuclear force capable of stalemate and then it requires constant competition and modernization to maintain such a nuclear force. This argument, and the rest of the examined literature, supports this research paper's claim that the United States must update its nuclear targeting strategy.

## **Methodology and Doctrinal Guidance**

This research paper used a qualitative methodology for answering four primary questions, which originated from several AFGSC queries. AFGSC inquired if the spread of liberal democracies and the nuclear taboo have changed international opinion to the extent that countervalue targeting is no longer viable. To go along with this investigation into countervalue, AFGSC asked if the idea of a counterforce targeting schema needs to be de-coupled from the idea of a first strike. To answer these questions, the research for this paper pulled from a litany of secondary sources on the subjects of deterrence, strategic targeting, and nuclear weapons. This research used several primary sources, all in the form of discussions with deterrence professionals and academics. The synthesis of this research presents a clear argument for why countervalue is no longer a credible threat for American deterrence, albeit countervalue threats remain valid for some other nuclear states, and for why counterforce requires revision.

The 2018 National Defense Strategy highlighted the need for America to reassess its ability to deter adversaries, explicitly stating that North Korea,

China, and Russia are all developing new capabilities including advanced delivery options for nuclear weapons.<sup>38</sup> The United States is pursuing modernization for its nuclear triad and ballistic missile defense; however, these technological solutions require a credible and capable targeting and messaging strategy to produce a convincing deterrent threat. America retains a technological advantage in the conventional realm, yet China and Russia are quickly approaching parity in several aspects of nuclear capability.<sup>39</sup> Similarly, America still enjoys nuclear superiority over its adversaries, but the gap is closing. The United States' nuclear modernization will help address some of the technological and numerical shortfalls, but America can further combat Russian and Chinese advancements through superior tactics and training. One way to showcase America's continued superior nuclear capability is with CNI.

The joint doctrine of the United States military discusses the importance of maintaining a flexible and integrated nuclear and conventional force.<sup>40</sup> Additionally, it acknowledges the importance of messaging, stating "effective military capabilities require that they be visible to and known by the adversary. The ability to communicate US intent, resolve, and associated military capabilities in ways that are understood by adversary decision makers is vital."<sup>41</sup> Finally, the joint doctrine recognizes the need for nuclear options along a spectrum from "limited use to large-scale employment" and that nuclear operations "must not assume use in isolation but must plan for strike integration into the overall scheme of fires."<sup>42</sup> Tying CNI to messaging and tailored nuclear targeting options presents a way to translate doctrine into practice.

Current joint doctrine provides a starting point for United States military planners; however, effectively executing CNI requires conventional and nuclear forces to integrate in exercises and live fly situations. Without exercising CNI, the United States military remains unprepared to implement a plan that requires both conventional and nuclear forces to integrate at the tactical level. In addition to providing the required training for American military forces, exercising CNI also allows America to message its deterrent capability in a way that is both highly visible to adversaries and demonstrates American credibility. Joint doctrine also promotes the importance of integrating planners with decision makers to achieve tailored deterrence options.<sup>43</sup> Current joint doctrine discusses the need for planning tailored deterrence options that are both flexible and quick to implement, but the concept of a tailored targeting strategy to complement tailored deterrence is missing.

Finally, the Chief of Staff of the United States Air Force (USAF), General C. Q. Brown, presented a series of action orders to the USAF as part of his "Accelerate Change or Lose" initiative.<sup>44</sup> In the third section of these action orders, General Brown specifically discusses the need for the USAF to "acceler-

ate its understanding and mastery of these competitions to accrue warfighting advantages to the United States and U.S. allies and partners.”<sup>45</sup> The following research argues for updating the concept of counterforce targeting to a continuum of options, along with introducing the idea of tailored targeting, providing military planners with the ability to present flexible options to national command authorities. Coupling these flexible options with a messaging strategy that includes exercising CNI capabilities provides the United States a way to compete with its adversaries. The United States must accept change and embrace strategic competition. A counterforce continuum and tailored targeting are two ways that the United States can excel in the strategic competitions of the twenty-first century.

## **Main Findings and Analysis**

When Giulio Douhet wrote *The Command of the Air* in 1921, the technology to execute his concepts for strategic bombing did not exist. He envisioned a fleet of airplanes that would bomb an enemy into capitulation, independent of other military action.<sup>46</sup> Douhet's idea was to use bombers to coerce adversary leadership by targeting civilian populations with what was essentially a countervalue attack.<sup>47</sup> With the introduction of nuclear weapons in 1945, the technology had caught-up to the theory and the United States took an approach to nuclear strategy that drove a single targeting solution. The newly independent USAF embraced Douhet's theory and developed plans, should war breakout, to destroy Soviet cities with nuclear weapons.<sup>48</sup> President Eisenhower, however, concluded that the idea of a nuclear war was so terrible that the only option was to use the threat of nuclear retaliation to avoid conflict; this policy became known as massive retaliation.<sup>49</sup> The cataclysmic potential of general thermonuclear war was so horrific that the purpose of the United States military changed from winning a war to avoiding war entirely.<sup>50</sup> During President Kennedy's administration, the United States publicly moved towards a counterforce strategy, but the policy of avoiding war with another nuclear power remained the practice through the Cuban Missile Crisis and Vietnam War.<sup>51</sup> Thus, in the first three decades that the United States possessed nuclear weapons and developed the concepts of counterforce and countervalue, the overall targeting strategy for the United States remained the same: avoid general nuclear war altogether by threatening to respond with a single massive volley of nuclear weapons striking all available targets.<sup>52</sup>

In the 1970s, nuclear targeting strategies remained constrained by two primary issues: the inability to rely on C2 networks to manage a nuclear conflict and the inability to discriminate between a counterforce and a countervalue attack.<sup>53</sup> The assumption at the time was that any nuclear exchange would quickly eliminate the President's ability to issue orders to the nuclear force. This presented a two-fold problem. First, if the President could not issue an execution order, then the nuclear weapons were unusable. Second, if the President could not communicate with the nuclear forces, then issuing a war termination order was also problematic.<sup>54</sup> This perceived problem resulted in the assumption that any nuclear warfighting options that required tightly coupled C2 were infeasible. The targeting plan remained essentially the same: a few options that all involved the massive employment of weapons against a large target set.<sup>55</sup>

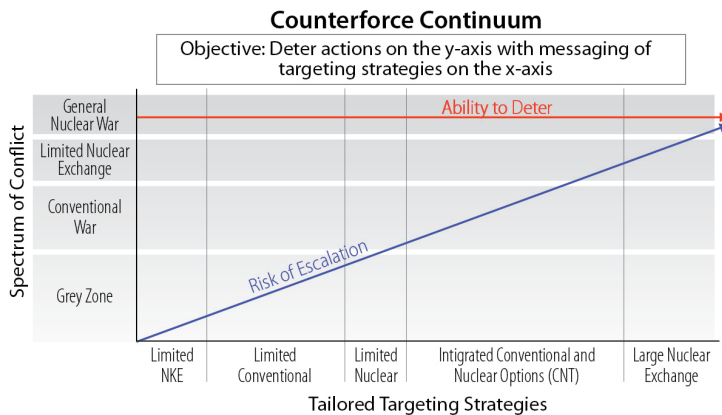
Another issue that constrains nuclear targeting is messaging. Many of the countervalue targets in the Soviet Union were located in close proximity to urban population centers. Therefore, to the Kremlin, a counterforce attack on the Soviet Union looked the same as a countervalue attack.<sup>56</sup> This issue remains true in the post-Cold War world. While modern technology provides high fidelity on ballistic missile trajectories, a nuclear armed adversary may still misinterpret a counterforce missile attack as a countervalue strike and respond in kind. Several modern nuclear states maintain a nuclear alert posture that is capable of a launch on warning response, thus the use of ballistic missiles, regardless of the targets or the quantity of missiles used, carries a significant probability of immediate escalation. Combined with the nuclear taboo, covered in more detail later, and the current international norms of liberal democracies, any threat of a massive nuclear attack, regardless of the targets, is credible in only the most desperate of situations that directly threatens national survival.<sup>57</sup>

Difficulties in discrimination and proportionality continue to complicate countervalue's messaging problems.<sup>58</sup> The discrimination challenge is that an adversary cannot determine if an incoming ballistic missile is part of a limited or a major nuclear attack. Therefore, rationally, the adversary will assume the worst case of a massive attack.<sup>59</sup> The proportionality problem argues that threatening to respond to non-nuclear attacks with nuclear weapons creates credibility issues. Both issues negate the credibility of a countervalue nuclear deterrent threat. If the United States messages a countervalue targeting strategy, then an adversary will assume that any ballistic missile attack from the United States is a countervalue attack. Likewise, if the United States does not have a proportional nuclear response, then it undermines any deterrent message that threatens a nuclear response to a non-nuclear attack.

Since 1945, the nonuse of nuclear weapons has created an internationally recognized taboo surrounding nuclear weapon employment. The taboo's power has gotten to the point where it is arguable whether the United States would use nuclear weapons even in response to a nuclear attack.<sup>60</sup> Because of the compounding difficulties of discrimination and the nuclear taboo, it is unlikely the United States would employ a countervalue nuclear attack even in response to an attack on mainland America.<sup>61</sup> Therefore, countervalue nuclear threats are no longer credible for American deterrence. To make credible nuclear deterrent threats, the United States must message, and demonstrate, a capable counterforce nuclear targeting strategy. Countervalue targeting, however, remains valid for other nuclear states.

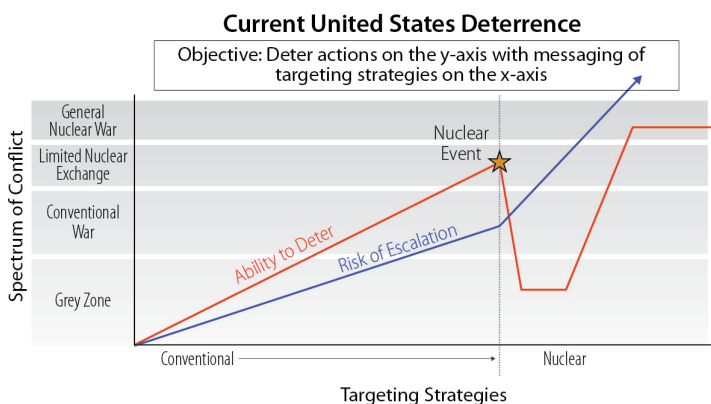
With the difficulties in discerning a countervalue and counterforce ballistic missile attack, countervalue nuclear threats only remain credible in specific circumstances. A nuclear state that maintains an assured retaliation nuclear posture can retain a credible countervalue nuclear deterrent.<sup>62</sup> For example, China has kept an extremely consistent assured retaliation posture since first acquiring nuclear weapons in the 1960s. By 1967, China's arsenal had a nuclear capable bomber, an ICBM, and a thermonuclear weapon. By all measures, they were a modern nuclear force. However, they did not pursue parity with the USSR or the United States. Instead, they built and maintained a survivable second-strike capability and never pursued a large number of weapons or a first strike capability. China possesses an arsenal of large megaton and inaccurate weapons. They have modernized their nuclear forces and added a nuclear capable submarine, but their goal remains the preservation of a survivable second-strike option. Technologically and resource wise, there is no reason China could not build a nuclear force to rival the United States or Russia, but they just choose not to. Instead, they pursue a strong conventional force that can match the United States and Russia.<sup>63</sup> Unlike the United States, a countervalue targeting strategy remains credible for Chinese deterrence.

With the incredibility of countervalue nuclear threats, counterforce is the only option left for the United States. Counterforce targeting remains valid for American deterrence, but it requires revision. The concept of counterforce requires decoupling from the idea of a first strike and expansion into tailorable targeting alternatives. A single, massive, first strike counterforce attack designed to eliminate the adversary's ability to respond is one extreme of a continuum of counterforce options. Dovetailing with the idea of tailored deterrence, tailored targeting provides planners a way to create credible deterrent threats based on the adversary. Currently, the United States views conventional operations and nuclear operations as separate enterprises. Given America's conventional superiority, this model does limit conflict escalation, up to the point of a limited nuclear exchange. But presently, the United States has a gap in its ability to deter conflict between conventional war and general nuclear war. American conventional superiority has also created space for adversaries to operate below the threshold of state-sponsored violence, otherwise known as the grey zone. To better manage conflict escalation and present deterrence options to the President at all levels of conflict, the United States must reevaluate how it messages deterrence. Figure 1, below, represents the United States' current deterrence situation.



**Figure 1. United States Deterrence**

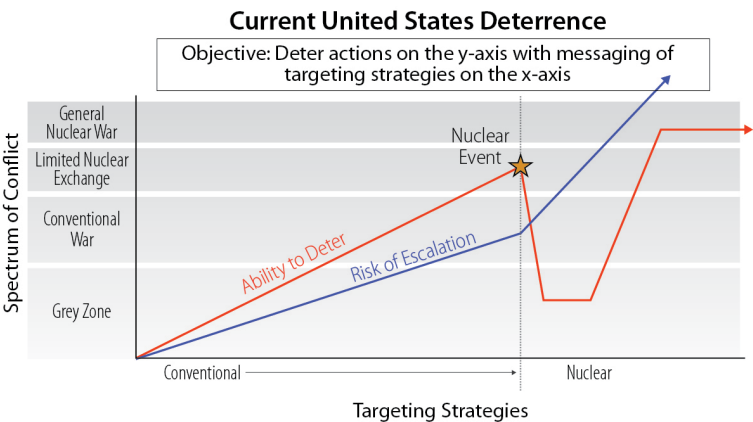
To make credible deterrent threats, the President requires a response option that matches adversary capabilities at every level. The 2018 National Security Strategy outlined the need for defense strategies tailored for individual adversaries and geographic regions; this is the basic concept for tailored deterrence.<sup>64</sup> A counterforce continuum of tailored targeting options presents a way to take the concepts of tailored deterrence and pair them with executable options to create credible deterrence threats at all levels of conflict. This concept integrates conventional and nuclear response options, depicted in Figure 2, to manage escalation by providing credible response options at all levels of conflict.



**Figure 2. Counterforce Continuum**

There are several historical examples of targeting methodologies that are applicable to nuclear deterrence and a counterforce continuum of targeting options. John Warden and Robert Pape both propose targeting methodologies to coerce an adversary. Warden’s ideas revolve around five rings: leadership, organic essentials, infrastructure, population, and fielded forces.<sup>65</sup> In addition to his five-ring model, Warden offers three strategies to compel the enemy: a strategy of imposed cost for coercion, paralysis leading to incapacitation, and destruction ending in annihilation.<sup>66</sup> “Collectively, these strategies represent a continuum of force application. The point chosen along that strategy continuum should coincide with the level of objective intent.”<sup>67</sup> Similarly, Pape presents four strategies for coercion: punishment, risk, denial, and decapitation.<sup>68</sup> Both of these models inform a way to reconceptualize counterforce targeting as a continuum.

Warden’s strategy of imposed cost seeks to make continued resistance too expensive for the enemy. “It attempts to do so by estimating the opponent’s pain threshold, based on his value system, and then exceeding this threshold as violently and instantaneously as possible through simultaneous parallel attacks upon the designated target set.”<sup>69</sup> This strategy works well with a counterforce continuum targeting strategy using the idea of tailored targeting. For an adversary that relies on a finite number of geographic decisive points to control an area. A tailored targeting solution that attacks critical nodes with nuclear, conventional, and non-kinetic attacks would be an example of Warden’s imposed cost strategy. This type of attack, depicted in Figure 3, would instantaneously exceed their ability to resist without causing significant collateral damage or massive civilian casualties.



**Figure 3. Example Tailored Targeting Attack using CNI<sup>70</sup>**



Of Pape's four strategies, the strategy of risk, or slowly ratcheting up the escalation, best applies to tailored targeting. When sending deterrent threats to an adversarial country that has nuclear inferiority relative to the United States, a strategy that holds a single valuable target at risk with a nuclear weapon provides planners with a way to send a credible deterrent message while avoiding immediate escalation to general nuclear war. If deterrence fails, a nuclear attack on a vital target achieves a military objective and demonstrates American resolve without resorting to a large-scale nuclear attack that escalates the conflict. For example, Figure 4 depicts a single fifteen kiloton nuclear weapon detonating on a notional high value target; this would send an escalatory message without creating excessive collateral damage or a mass casualty event; therefore, limiting the likelihood of further escalation.



**Figure 4. 15 kiloton Nuclear Blast on a Notional Critical Target<sup>71</sup>**

However, neither Warden nor Pape's models perfectly translate to a counterforce continuum of tailored targeting options. Warden advocates for targeting methods that achieve strategic paralysis, a condition where the adversary is unable to further process information or provide C2 to its military forces, while Pape advocates for a strategy of denial that removes the adversary's ability to further pursue a military objective. Targeting enemy leadership and C2 networks with nuclear weapons is problematic. If the country maintains an alert force for its nuclear weapons, attacking C2 networks induces a high probability of escalation to general nuclear war. This does not mean that tailored targeting cannot achieve strategic paralysis, rather it demonstrates the need for tailored solutions that are unique to the intended adversary. Realizing tailored targeting solutions for tailored deterrence requires a new continuum of counterforce deterrence options that augments the currently available targeting methodologies.

Counterforce targeting can be reimagined as a continuum of options to achieve effects along the entire spectrum of conflict. Figure 5 is a notional example of a counterforce continuum of tailored targeting strategies. The tailored targeting strategy must align the military and political objectives. At one extreme is the classic definition of counterforce; an attack on enemy nuclear forces and C2 networks intended to disable the enemy's ability to launch its nuclear forces. At the other extreme is a single, low-yield, precise nuclear detonation. A coordinated nuclear attack on enemy C2 networks might produce strategic paralysis while a single nuclear weapon targeting option might hold a critical decisive point at risk. The United States has nuclear forces capable of employing nuclear weapons at any point along this spectrum; however, America does not currently message, plan, or exercise options at the lower end of this spectrum.

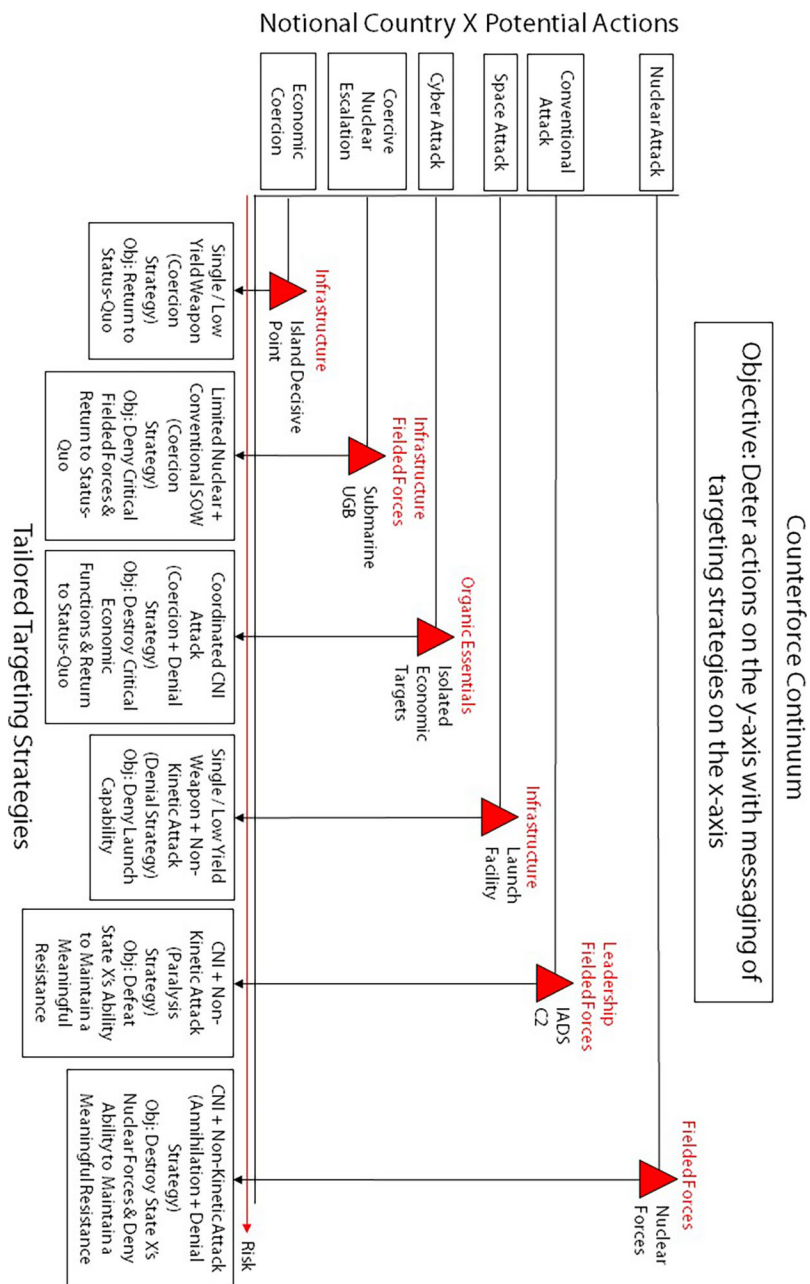


Figure 5. Example Counterforce Continuum of Tailored Targeting Strategies

Another issue with implementing a counterforce continuum targeting strategy is the American aversion to precise nuclear weapons. The United States military and political system maintains an enduring argument that advanced nuclear weapons, specifically weapons that increase counterforce targeting capability, are destabilizing.<sup>72</sup> The argument is that any qualitative or quantitative nuclear advantage provides an incentive for a state to use its nuclear arsenal. Paradoxically, the result of avoiding advanced nuclear weapons is a reliance on a countervalue targeting strategy that would produce mass civilian casualties if it were ever employed.<sup>73</sup> America's adversaries do not share this aversion to new nuclear weapons, rapid delivery systems, or precision guidance for nuclear weapons.

Technology and strategy often take years to synchronize. After fielding a nuclear cruise missile, it took twenty years for the United States to develop long range conventional precision strike cruise missiles.<sup>74</sup> The American military is currently experiencing the opposite technological lag between high-precision conventional weapons and nuclear weapons. America displayed the precision revolution on the international level starting with Operation Desert Storm in 1991. However, this precision revolution has not yet led to highly precise nuclear weapons. To fully exploit a counterforce continuum targeting strategy, nuclear weapon guidance technology must catch-up to conventional weapon capability.

To implement the idea of a counterforce continuum, planners require a method to match targeting strategies with the intended effect. Tailored targeting provides this solution. The United States has adopted the concept of tailored deterrence to send specific deterrent messages to different adversaries. Tailored targeting, likewise, provides planners with the ability to achieve a multitude of effects across the entire spectrum of conflict and message tailored deterrent threats to individual adversaries.

In an era of great power competition, tailored targeting and a counterforce continuum provide policy makers and planners with a competitive, and credible, deterrent strategy. The United States must continue to compete with nuclear weapons; a nuclear stalemate is difficult to achieve, and a secure second-strike capability requires modernization to remain viable. Finally, deterring conventional attacks with nuclear weapons requires usable, and credible, nuclear options.<sup>75</sup> Messaging tailored targeting options to America's adversaries, and then building credibility with exercises that include nuclear and conventional forces, provides the United States with usable nuclear options. Nuclear states that are conventionally inferior or have an existential threat of catastrophic defeat are more likely to develop CNE tactics, which use the threat of nuclear escalation as a counter to a conventionally superior state.<sup>76</sup> The United States and NATO employed CNE tactics in the Cold War to deter a superior Soviet Union conventional attack. Today, Russia uses CNE to deter

a conventionally superior United States.<sup>77</sup> Tailored targeting solutions on a counterforce continuum seek to achieve deterrence, not coercion, but it would provide the United States a credible deterrent against countries seeking to use CNE tactics to counter American conventional superiority.

Finally, messaging tailored targeting deterrent threats is most credible if the United States maintains nuclear superiority. A secure second-strike capability will deter nuclear aggression against mainland America, but not all nuclear retaliation capabilities are equal.<sup>78</sup> A state that has nuclear superiority over their adversary can increase escalation further than the inferior state.<sup>79</sup> Historically, states with nuclear superiority prevail in crisis situations over states that are nuclear inferior.<sup>80</sup> The intent of a counterforce continuum of tailored targeting options is not to win a nuclear war, it is to send credible deterrent messages to potential adversaries. Providing American policy makers with credible deterrent threats allows the United States to deter conflict across the full spectrum of warfare. A nuclear superior United States can message deterrent threats that are highly believable to its adversaries and allows America to push harder with its diplomatic pressure with less risk of escalation to open warfare.

There are several counter arguments to increasing the United States' counterforce nuclear posture and messaging. In the most recent interim National Security Strategy, President Biden's administration states that the United States "will take steps to reduce the role of nuclear weapons in our national security strategy."<sup>81</sup> While the interim guidance does not specify how the new administration plans to reduce the role of nuclear weapons, there are politicians who propose further unilateral reductions to America's nuclear stockpile and oppose nuclear modernization efforts. Further unilateral decreases in the United States' nuclear arsenal, or a failure to modernize existing forces, will force America into a countervalue targeting strategy.<sup>82</sup> As this research has demonstrated, countervalue nuclear threats are not credible for the United States. Therefore, further reductions and modernization delays will not decrease American dependence on nuclear weapons for national security but will decrease America's ability to respond to a national security crisis with a proportional response. A counterforce continuum of tailored targeting options, however, does provide American politicians with options that leverage existing nuclear weapons to make credible deterrent threats.

Another counterargument against developing usable nuclear targeting options is that any use of nuclear weapons will result in such catastrophic damage and massive loss of life that short of retaliation for a nuclear strike on the American homeland, any use of nuclear weapons does not meet the principle of *jus in bello*; the internationally accepted norm of discrimination and proportionality in warfare.<sup>83</sup> This argument does not match the reality of nuclear

weapons effects. For example, the United States can message a limited nuclear strike to hold an island target at risk with little chance of mass casualties should deterrence fail. Figures 6 and 7 demonstrate this point with a hypothetical nuclear detonation on an island in the Florida Keys.



Figure 6. 1.5 kiloton airburst over Boca Chica Field, Key West, Florida.<sup>84</sup>

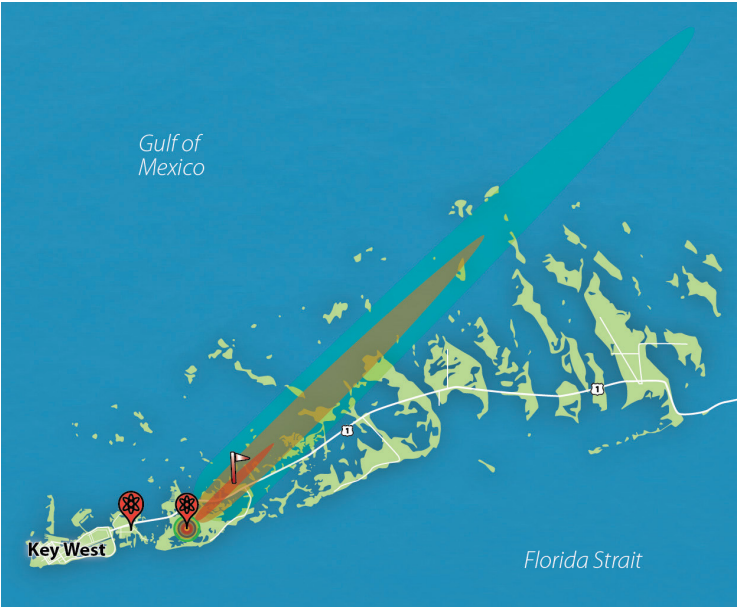


Figure 7. 1.5 kiloton surface detonation on Boca Chica Field, Key West, Florida.<sup>85</sup>

Both examples are a 1.5 kiloton nuclear detonation. Figure 6 depicts an airburst detonation and Figure 7 depicts a surface detonation. In both cases, assuming an accurately delivered nuclear weapon, the resulting nuclear effects would destroy the airfield and surrounding infrastructure with minimal expected collateral damage.<sup>86</sup> If the target required a larger weapon, as depicted in Figure 8, the collateral damage is still far from the catastrophic effects usually associated with general nuclear war.



**Figure 8. 15 kiloton airburst detonation over Boca Chica Field, Key West, Florida**

These examples demonstrate that a nuclear weapon can achieve an intended effect against a valid military target in a proportional way. The problem again lies in messaging. Any ballistic missile attack originating from the United States or an American submarine risks misinterpretation as the start of a massive nuclear attack. Messaging a limited attack requires the United States military to fly conventional and nuclear assets in exercise situations to demonstrate that America has a credible limited nuclear response option.

The above research demonstrates the merit of a counterforce continuum and tailored targeting for bolstering American deterrence. Countervalue nuclear targeting strategies are not credible for American deterrence. The final chapter of this research paper discusses how to turn the concept of counterforce continuum nuclear targeting and tailored targeting from concepts into reality through exercises and messaging.

## Recommendations and Conclusion

Simply stated, tailored targeting is a concept that matches adversary vulnerabilities with the United States' political objectives to produce a unique targeting solution. When paired with a deliberate strategic messaging strategy, tailored targeting provides the President with a credible deterrent option. A strategy of multiple tailored targeting solutions for various contingencies creates an effective deterrent strategy for the United States along the entire spectrum of conflict.



**Figure 9. Tailored Targeting<sup>87</sup>**

To move the concepts of tailored targeting and the counterforce continuum from theory to reality requires testing and validation before incorporation into strategy and doctrine. Wargaming and implementing the ideas of a counterforce continuum of tailored targeting options into military exercises is a logical starting place for this testing and validation. As the United States continues to develop a tailored deterrent strategy for potential adversaries, planners can identify potential target sets for tailored targeting solutions. As this research has demonstrated, tailored deterrence requires tailored targeting solutions that exploit adversaries' vulnerabilities, limit the potential for escalation, and present opportunities to send clear deterrent messages.

Before implementing these concepts into military contingency plans, they require vetting in wargaming scenarios. The United States must "think about the unthinkable" and simulate fighting wars that include conventional, nuclear, and non-kinetic weapons.<sup>88</sup> Wargaming scenarios with conventional and nuclear elements is a place to start working through the challenges of CNI. It is also an excellent way to develop targets that work with the concept of tailored targeting. Identifying critical targets and effects allows the United States to develop a tailored deterrence message for potential adversaries. These plans can then move into the demonstrating efficacy, and therefore messaging, phase with live fly exercises.



After wargaming tailored targeting and the counterforce continuum, the concepts require testing in an exercise situation. One potentially ideal exercise for the initial testing of these concepts is Combat Raider (CR). CR takes place out of Ellsworth AFB in South Dakota, utilizing the Powder River Training Complex airspace. The exercise includes bombers from all the AFGSC bases along with conventional assets from other USAF commands. This exercise is large enough to test new integration concepts but is not so massive that it would encounter significant organizational or bureaucratic obstacles when testing new ideas. Initially, a CR exercise could work through some of the planning, communication, and execution issues when conventional and nuclear forces are operating together. After a few iterations of bomber CNI, CR could integrate with an ICBM wing from AFGSC to plan and execute a larger tailored targeting simulation. Integration with the ICBM force might culminate with a test launch that validates the CNI command, control, and communication architecture. These exercises will provide valuable training for AFGSC Airmen and, in turn, build credibility for America's CNI capability. Real world exercises also provide policy makers in the United States with tangible results that they can then use to send credible deterrent messages.

Moving past CR, CNI tactics, techniques, and procedures, along with tailored targeting solutions, can integrate into larger AFGSC exercises and, eventually, into BTF missions. Employing a BTF that includes conventional and nuclear bombers, working together with allied partners, sends a clear message of resolve and demonstrates capability. This is a logical extension of the already flexible, and tailored, messages of current BTF missions. For example, a nuclear bomber, or a dual-capable aircraft, might rendezvous with a formation of forward deployed conventional fighters and bombers to conduct a training mission in an area where a previously identified critical target in a tailored targeting solution exists. This type of BTF mission would create a highly visible and credible deterrent message while also demonstrating America's ability to project power.

The United States must have deterrent threats that are credible in the multipolar world of great power competition. Countervalue targeting strategies and deterrent threats are no longer credible for American deterrence. A nuclear force pressed into a countervalue targeting strategy due to stagnation or reductions undermines America's deterrent credibility. Counterforce targeting strategies require decoupling from the idea of a large first strike option and technologies such as precision guided nuclear warheads must be viewed as enhancing deterrent options and not as destabilizing weapons. A credible deterrent threat requires a military that can execute realistic CNI operations and give the President options to deter aggression at every level of conflict.

Re-envisioning nuclear targeting strategies as a continuum of tailored targeting solutions, along with executing realistic CNI training, provides the United States with deterrent threats that are credible in the modern geopolitical landscape. The lessons learned from wargaming and exercising these concepts will allow planners to implement the idea of a counterforce continuum and tailored targeting into future contingency plans to provide senior leaders with credible and tailored deterrence options.

### Notes

(All notes appear in shortened form. For full details, see the appropriate entry in the bibliography.)

1. Craig, *Destroying the Village*, 162.
2. Kaplan, *The Bomb*.
3. Brodie, *Strategy in the Missile Age*, 229.
4. Tannenwald, *The Nuclear Taboo*, 16.
5. Gallagher and Sorice, "Considering Alternative Nuclear Targeting Strategies," 451–65.
6. Narang, *Nuclear Strategy in the Modern Era*, 22.
7. Narang, *Nuclear Strategy in the Modern Era*, 121.
8. Lieber and Press, *The Myth of the Nuclear Revolution*.
9. Fadok, "John Boyd and John Warden," 373.
10. Specifically, the average CEP of a GBU-31.
11. Roberts, *The Case for US Nuclear Weapons in the 21st Century*, 271.
12. Glasstone, *The Effects of Nuclear Weapons*.
13. Guest Speaker, "Strategic Arms Control."
14. Joint Chiefs of Staff, "Joint Publication 3-72 Joint Nuclear Operations."
15. Craig, *Destroying the Village*.
16. Ball and Richelson, *Strategic Nuclear Targeting*.
17. Cotter, "Peacetime Operations: Safety and Security."
18. Narang, *Nuclear Strategy in the Modern Era*.
19. Narang, *Nuclear Strategy in the Modern Era*, 11.
20. Narang, *Nuclear Strategy in the Modern Era*, 121.
21. Pape, *Bombing to Win*, 18.
22. Pape, *Bombing to Win*, 18.
23. Pape, *Bombing to Win*, 55.
24. Pape, *Bombing to Win*, 35.
25. Fadok, "John Boyd and John Warden."
26. Gallagher and Sorice, "Considering Alternative Nuclear Targeting Strategies."
27. Roberts, *The Case for US Nuclear Weapons in the 21st Century*.
28. Roberts, *The Case for US Nuclear Weapons in the 21st Century*, 271.
29. Bracken, *The Second Nuclear Age*, 6.

30. Bracken, *The Second Nuclear Age*, 80.
31. Bracken, *The Second Nuclear Age*, 81.
32. Bracken, *The Second Nuclear Age*, 80.
33. Kroenig, *The Logic of American Nuclear Strategy*, 202.
34. Kroenig, *The Logic of American Nuclear Strategy*, 15.
35. Lieber and Press, *The Myth of the Nuclear Revolution*, 94.
36. Lieber and Press, *The Myth of the Nuclear Revolution*, 108.
37. Lieber and Press, *The Myth of the Nuclear Revolution*, 110.
38. Office of the Secretary of Defense, *Summary of the 2018 National Defense Strategy*, 8.
39. Office of the Secretary of Defense, Military and Security Developments Involving the People's Republic of China: Annual Report to the Congress, ix.
40. Joint Chiefs of Staff, "Joint Publication 3-72 Joint Nuclear Operations," II-1.
41. Joint Chiefs of Staff, "Joint Publication 3-72 Joint Nuclear Operations," I-4.
42. Joint Chiefs of Staff, "Joint Publication 3-72 Joint Nuclear Operations," V-3.
43. Joint Chiefs of Staff, "Joint Publication 3-72 Joint Nuclear Operations," III-1.
44. Gen Brown Jr., "Accelerate Change or Lose."
45. Gen Brown Jr., "CSAF Action Order C: Competition," 1.
46. Douhet, *The Command of The Air*.
47. Douhet, *The Command of The Air*.
48. Craig, *Destroying the Village*.
49. Craig, *Destroying the Village*, viii.
50. Brodie, "The Absolute Weapon."
51. Craig, *Destroying the Village*, 51.
52. Schlosser, *Command and Control*, 457.
53. Ball and Richelson, *Strategic Nuclear Targeting*, 15.
54. Ball and Richelson, *Strategic Nuclear Targeting*.
55. Ball and Richelson, *Strategic Nuclear Targeting*, 57.
56. Ball and Richelson, *Strategic Nuclear Targeting*, 15.
57. Tannenwald, *The Nuclear Taboo*, 16.
58. Montgomery, "Posturing for Great Power Competition."
59. Schelling, *Arms and Influence*.
60. Tannenwald, *The Nuclear Taboo*, 16.
61. Tannenwald, *The Nuclear Taboo*.
62. Narang, "Nuclear Strategies of Emerging Nuclear Powers," 73-91.
63. Narang, *Nuclear Strategy in the Modern Era*, 123.
64. Office of the Secretary of Defense, *Summary of the 2018 National Defense Strategy*, 45.
65. Fadok, "John Boyd and John Warden," 373.
66. Fadok, "John Boyd and John Warden."
67. Fadok, "John Boyd and John Warden," 375.
68. Pape, *Bombing to Win*, 18.
69. Fadok, "John Boyd and John Warden," 375.

70. Wellerstein, "NUKEMAP?"
71. Wellerstein, "NUKEMAP?"
72. Kroenig, *The Logic of American Nuclear Strategy*, 130.
73. Kroenig, *The Logic of American Nuclear Strategy*.
74. Bracken, *The Second Nuclear Age*, 80.
75. Lieber and Press, *The Myth of the Nuclear Revolution*, 5.
76. Lieber and Press, *The Myth of the Nuclear Revolution*, 108.
77. Lieber and Press, *The Myth of the Nuclear Revolution*.
78. Kroenig, *The Logic of American Nuclear Strategy*, 3.
79. Kroenig, *The Logic of American Nuclear Strategy*, 15.
80. Kroenig, *The Logic of American Nuclear Strategy*, 79.
81. The White House, Interim National Security Strategic Guidance, 13.
82. Gallagher and Sorice, "Considering Alternative Nuclear Targeting Strategies."
83. Walzer, *Just and Unjust Wars*, 21.
84. Wellerstein, "NUKEMAP?"
85. Wellerstein, "NUKEMAP?"
86. Glasstone, *The Effects of Nuclear Weapons*.
87. I wish to thank Maj Roni Yadlin for her efforts in creating this figure.
88. Bracken, *The Second Nuclear Age*, 81.

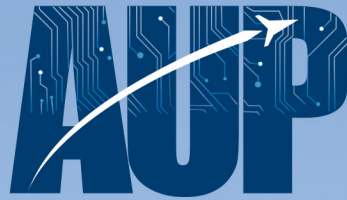
## **Abbreviations**

AFGSC	Air Force Global Strike Command
BTF	Bomber task force
CNE	Coercive nuclear escalation
CNI	Conventional nuclear integration
CR	Combat Raider
USAF	United States Air Force

## **Bibliography**

- Ball, Desmond and Jeffery Richelson. *Strategic Nuclear Targeting*. Ithaca, NY: Cornell University Press, 1986.
- Bracken, Paul. *The Second Nuclear Age: Strategy, Danger, and the New Power Politics*. New York, NY: St. Martin's Griffin, 2012.
- Brodie, Bernard. *Strategy in the Missile Age*. Santa Monica, CA: RAND Corporation, 1959.
- “The Absolute Weapon: War in the Atomic Age” in *The Absolute Weapon: Atomic Power and World Order* edited by Bernard Brodie (New Haven, CT: Yale Institute of International Studies, 1946).
- Brown Jr., Gen Charles Q. “Accelerate Change or Lose.” USAF Chief of Staff, August 2020.
- “CSAF Action Order C: Competition.” USAF Chief of Staff, August 2020.
- Cotter, Donald S. “Peacetime Operations: Safety and Security,” *Managing Nuclear Operations*. Ashton Carter, et al. Washington, D.C.: The Brookings Institution, 1987.
- Craig, Campbell. *Destroying the Village: Eisenhower and Thermonuclear War*. New York, NY: Columbia University Press, 1998.
- Douhet, Giulio. *The Command of The Air*, trans. Dino Ferrari. Washington, D.C.: Air Force History and Museums Program, 1998.
- Fadok, David. “John Boyd and John Warden: Airpower’s Quest for Strategic Paralysis,” in *The Paths of Heaven: The Evolution of Air Power Theory*. edited by Philip Meilinger (Maxwell AFB, AL: Air University Press, 1997).
- Gallagher, Mark and Justin Sorice. “Considering Alternative Nuclear Targeting Strategies,” *Comparative Strategy* 33, no. 5 (December 2014).
- Glasstone, Samuel. *The Effects of Nuclear Weapons*, Third Edition (United States Department of Defense, 1977).
- Guest Speaker. “Strategic Arms Control.” Lecture, School of Advanced Nuclear Deterrence Studies, Maxwell AFB, AL, via Zoom, 30 October 2020.
- Joint Chiefs of Staff, “Joint Publication 3-72 Joint Nuclear Operations,” 17 April 2020, V-3.
- Kaplan, Fred. *The Bomb: Presidents, Generals, and the Secret History of Nuclear War*. New York, NY: Simon & Schuster, 2020.
- Kroenig, Matthew. *The Logic of American Nuclear Strategy: Why Strategic Superiority Matters*. New York, NY: Oxford University Press, 2018.
- Lieber, Keir A. and Daryl G. Press. *The Myth of the Nuclear Revolution: Power Politics in the Atomic Age*. Ithaca, NY: Cornell University Press, 2020.

- Montgomery, Evan Braden. "Posturing for Great Power Competition: Identifying Coercion Problems in U.S. Nuclear Policy." *Journal of Strategic Studies*, 24 February 2012, <https://www.tandfonline.com/>.
- Narang, Vipin. *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict*. Princeton, NJ: Princeton University Press, 2014.
- "Nuclear Strategies of Emerging Nuclear Powers: North Korea and Iran." *The Washington Quarterly*, no. 38:1, pages 73-91 (2015).
- Office of the Secretary of Defense, Summary of the 2018 National Defense Strategy, (Washington, DC, 2018).
- Military and Security Developments Involving the People's Republic of China: Annual Report the Congress, (Washington, DC, 2020).
- Pape, Robert A. *Bombing to Win: Air Power and Coercion in War*. Ithaca, NY: Cornell University Press, 1996.
- Roberts, Brad. *The Case for US Nuclear Weapons in the 21st Century*. Stanford, CA: Stanford University Press, 2016.
- Schelling, Thomas C. *Arms and Influence*. New Haven, CT: Yale University Press, 1966.
- Schlosser, Eric. *Command and Control: Nuclear Weapons, the Damascus Accident, and the Illusion of Safety*. New York, NY: Penguin Books, 2014.
- Tannenwald, Nina. *The Nuclear Taboo: The United States and the Non-Use of Nuclear Weapons Since 1945*. Cambridge, UK: Cambridge University Press, 2007.
- Walzer, Michael. *Just and Unjust Wars: A Moral Argument with Historical Illustrations*. New York, NY: Basic Books, 1977.
- Wellerstein, Alex. "NUKEMAP" 2012-2020, <https://nuclearsecrecy.com/>.
- The White House. Interim National Security Strategic Guidance. Washington, DC, March 2021.



AIR UNIVERSITY PRESS

<https://www.airuniversity.af.edu/AUPress/>

