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**Monterey, California**



**THESIS**

**THE DAWN OF CRUISE MISSILE DIPLOMACY**

by

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June 1997

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## THE DAWN OF CRUISE MISSILE DIPLOMACY

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Submitted in partial fulfillment of the  
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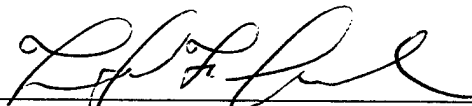
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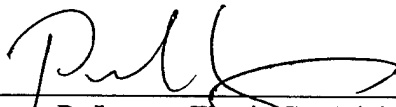
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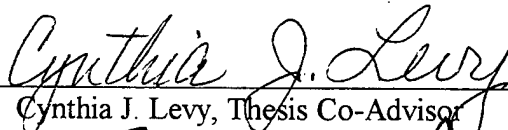


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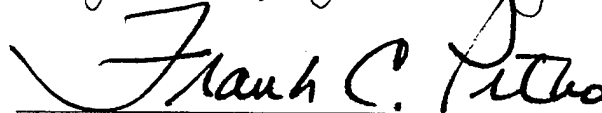
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## ABSTRACT

The Tomahawk cruise missile has become the weapon of choice for the U.S. National Command Authority (NCA) following the Persian Gulf War. It appears that the Tomahawk cruise missile has supplanted more traditional military methods of gunboat diplomacy, such as attack aircraft and naval gunfire, as the primary means of delivering a military punch to achieve political gain. Since their first use in Operation Desert Storm, more than one hundred Tomahawk cruise missiles have been fired in battle in four separate instances: the January and June 1993 strikes in Iraq, the September 1995 strikes in Bosnia, and the September 1996 strikes in Iraq.

This thesis traces the evolution of the Tomahawk cruise missile since its debut in the 1991 Gulf War as an instrument in the execution of U.S. foreign policy and examines the reasons for the increased U.S. reliance on the Tomahawk. This research describes this unique weapon system, examines why Tomahawk has become the U.S. weapon of choice, and examines the likely political and military repercussions of the future employment of Tomahawk cruise missiles.



## TABLE OF CONTENTS

I. BACKGROUND AND INTRODUCTION.....	1
II. THE TOMAHAWK WEAPON SYSTEM.....	11
III. THE JANUARY 1993 STRIKE : IRAQ.....	19
IV. THE JUNE 1993 STRIKE : IRAQ.....	25
V. THE SEPTEMBER 1995 STRIKE : BOSNIA.....	33
VI. THE SEPTEMBER 1996 STRIKE : IRAQ.....	37
VII. CONCLUSIONS.....	43
APPENDIX A: THE BRITISH TOMAHAWK SALE.....	53
APPENDIX B: SECRETARY CHENEY INTERVIEW.....	57
APPENDIX C: GENERAL POWELL RESPONSE.....	59
BIBLIOGRAPHY.....	61
INITIAL DISTRIBUTION LIST.....	65





## LIST OF FIGURES

Figure 1.	Tomahawk (TLAM-D) Cruise Missile in Flight.....	11
Figure 2.	Tomahawk Worldwide Coverage.....	12
Figure 3.	A Vertical Launch of a Tomahawk Cruise Missile.....	13
Figure 4.	Tomahawk Flight Profile.....	15
Figure 5.	Tomahawk Baseline Improvement Program (TBIP).....	16



## LIST OF ACRONYMS AND ABBREVIATIONS

AGM	Air-to-Ground Missile
APS	Afloat Planning System
AWACS	Airborne Warning and Control System aircraft
CALCM	Conventional Air Launched Cruise Missile
CIA	Central Intelligence Agency
CINC	Commander in charge
CMSA	Cruise Missile Support Activity
DSMAC	Digital Scene Map Area Correlator
FBI	Federal Bureau of Investigation
GPS	Global Positioning System
HARM	High Speed Anti-Radiation Missile
IAEA	International Atomic Energy Agency
JCS	Joint Chiefs of Staff
LGB	Laser Guided Bomb
MITL	Man-in-the-loop
NATO	North Atlantic Treaty Organization
NCA	National Command Authority
PST	Precision Strike Tomahawk
SAM	Surface-to-Air Missile
SAR	Synthetic Aperture Radar
SLAM	Standoff Land Attack Missile
TACAIR	Tactical Aircraft
TASM	Tomahawk Anti-Ship Missile
TBIP	Tomahawk Baseline Improvement Program
TERCOM	Terrain Contour Matching
TLAM	Tomahawk Land Attack Missile
TLAM-C	Tomahawk Land Attack Missile (Unitary Warhead)
TLAM-D	Tomahawk Land Attack Missile (Bomblet Dispersal Warhead)
TOA	Time-of-Arrival
UN	United Nations



## ACKNOWLEDGMENTS

I wish to thank the following people. Without their guidance and support, this project would not have been possible. First of all, I would like to thank my advisors, Professors Peter Lavoy and Cynthia Levy, for their direction throughout the thesis process. I also wish to extend my appreciation to the following people for providing me much needed research information and contacts: Mary Robin Holliday at the Center for Naval Analyses, Lieutenant Commander Gary English at the Program Executive Office (Cruise Missiles and UAVs), Lieutenant Commander Don Dombrowsky and Lieutenant Eric Ver Hage at Afloat Planning Systems, Pacific, and fellow student Lieutenant Eric Jones for his friendship and for acting as a sounding board for me over my course of study at the Naval Postgraduate School. I am also grateful to former Secretary of Defense Dick Cheney and former National Security Advisor and Chairman of the Joint Chiefs of Staff General Colin Powell for granting me time out of their busy schedules to answer my research questions.

And most importantly, I wish to extend my heart-felt appreciation to my close friends and family, but especially to my parents for their constant love and encouragement and to whom this thesis is dedicated. They have been and always will be a continual source of inspiration and motivation for me.



## EXECUTIVE SUMMARY

The Tomahawk cruise missile has become the weapon of choice for the U.S. National Command Authority (NCA) in the years subsequent to the Persian Gulf War. The Tomahawk cruise missile has supplanted more traditional military methods of gunboat diplomacy, such as attack aircraft and naval gunfire, as the primary means of delivering a military punch to achieve political gain. Since their first use in Operation Desert Storm, more than one hundred Tomahawk cruise missiles have been fired in battle in four separate instances: the January and June 1993 strikes in Iraq, the September 1995 strikes in Bosnia, and the September 1996 strikes in Iraq.

This thesis traces the evolution of the Tomahawk cruise missile since its debut in the 1991 Gulf War as an instrument in the execution of U.S. foreign policy and examines the reasons for the increased U.S. reliance on the Tomahawk. This research describes this unique weapon system, examines why Tomahawk has become the NCA weapon of choice, and examines the likely political and military repercussions of the future employment of Tomahawk cruise missiles.

The Tomahawk land attack cruise missile has matured significantly as a conventional weapon system since its debut in the 1991 Gulf War. Tomahawk has undergone several upgrades to its capabilities and is planned to undergo several more, including improvements still under development. The United States has made an enormous investment in this weapon system, and all indications point to a commitment by the Navy to see the continued development of this much heralded weapon system and



further adaptation to fleet operations, such that Tomahawk and its evolutionary descendants will continue to serve as the NCA "weapon of choice."

## **CONCLUSIONS AND POLICY RECOMMENDATIONS**

These cases provide telling examples of why the United States has come to rely almost exclusively on the Tomahawk cruise missile as *the primary military instrument* to achieve U.S. political goals when force is deemed necessary by the NCA. These cases also provide clues as to the likely political and military implications of the future employment of Tomahawk cruise missiles.

An often utilized asset of the NCA and theater commanders in recent years, Tomahawk cruise missiles have demonstrated political utility when employed in the execution of U.S. foreign policy. That utility has primarily taken two forms following the 1991 Gulf War: as a means of avoiding casualties to U.S. military personnel and U.S. adversaries, and as a means of conducting unilateral U.S. military action.

Avoiding civilian casualties has been a priority of U.S. policy. Avoiding any unnecessary loss of life has always been a maxim of the United States when exercising the military option. In recent years, however, that maxim has been warped into a false misperception -- that the United States must avoid virtually all risk of casualties, whether in the form of downed pilots or bloodshed, when employing military force in a conflict. In all four cruise missile strikes, minimizing the risk of casualties was a primary concern of the NCA.

The use of Tomahawk cruise missiles has also vacillated between employment as strategic and tactical weapons. In the 1993 strikes on the Zaafaraniyah nuclear weapon components manufacturing facility and on the Iraqi Intelligence headquarters, the employment of Tomahawks was strategic. In the 1995 attack on the Bosnian Serb air defense system, Tomahawks were employed tactically. In the 1996 strikes on the Iraqi air defense system, the employment of Tomahawks was both tactical and strategic.

With recent developments to the Tomahawk weapon system improving and expanding all aspects of the cruise missile's performance, the continued evolution of the weapon system indicates that the Tomahawk will become more tactical in the coming years.

Even though thirteen air-launched cruise missiles (CALCMs) were used in the September 1996 strikes on Iraq, their contribution to the dawn of cruise missile diplomacy and the continuing evolution of air power has been insignificant and should be considered an anomaly. The traditional argument about which service, the Navy or the Air Force, best provides the United States with global presence and conducts diplomacy on a regular basis is manifested in the four cruise missile strikes since 1991, and even more so in the September 1996 cruise missile restrike. Forced to restrike less than twenty-four hours after the initial cruise missile attack, Navy Tomahawks were the weapons of choice.

Until an effective defense to the cruise missile threat is realized, the Tomahawk cruise missile and its evolutionary descendants will remain the NCA "weapon of choice" for the foreseeable future. Tomahawk cruise missiles have supplanted more traditional

methods of military force as the primary means of delivering a military punch to achieve political gain -- a result of their seemingly politically risk-free nature.

The issue is not whether or not manned attack-aircraft could have gotten the job done at less "cost" or more efficiently than cruise missiles in the four cases discussed. The point is that cruise missiles *did* fulfill roles that previously would have been reserved for more traditional methods of military force prior to the 1991 Gulf War.

This is not to suggest that cruise missiles and other "smart weapons" can and will replace all other military instruments in achieving political objectives. Just as strategic air power has not replaced the need for combat troops and naval forces as once was envisioned, cruise missiles will not completely replace all other military means of accomplishing political objectives. However, if cruise missiles and similar unmanned "smart weapons" can be employed so as to achieve the same political objectives as more traditional military means such as attack aircraft, then they should be used, regardless of whether or not mission accomplishment requires multiple missile salvos.

The Department of the Navy and Department of Defense should aggressively pursue the continued procurement and future development of the Tomahawk weapon system and its evolutionary deep-strike descendants.

Additionally, policy makers should continue to consider the strategic value that Tomahawk capable platforms have on the capability to impact regional events and provide political leverage on a continual basis. However, policy makers also need to maintain the patience necessary for diplomatic efforts to run their course before resorting to using military leverage to attain political goals. The ability to use military force with seemingly

risk-free weapons runs the danger of becoming an easy solution for resolving conflicts. Diligence and leadership must continue to be exercised to keep the American public apprised of the true costs and risks involved in using any military force. Because of the speed of modern day telecommunications and “instant second-guessing,” the NCA must be ever the more tenacious in its pursuit of worthy political objectives and its assurance to the American public of its justification for using military force to attain those political objectives.

Despite their recent uses as strategic weapons, Tomahawk cruise missiles are tactical weapons and should maintain their tactical weapon status, at the disposal of theater commanders for use in tactical, as well as strategic, situations. Tomahawk employment by the NCA in the 1990s has had strategic implications for the future of U.S. regional deterrence. As tools of persuasion, Tomahawk-capable surface combatants and submarines have been elevated to a status-level previously reserved only for the venerable aircraft carrier. Since the end of the 1991 Gulf War, Tomahawk-capable platforms have demonstrated that Tomahawk cruise missiles are the NCA “weapon of choice” and the primary means of delivering a military punch to achieve political gain. In time of crisis, no longer is the question, “where is the nearest carrier,” but instead “where are the Tomahawks?”



## I. BACKGROUND AND INTRODUCTION

The Tomahawk cruise missile has become the weapon of choice for the United States National Command Authority (NCA) in the years subsequent to the Persian Gulf War. It has supplanted more traditional military methods such as attack aircraft and naval gunfire as the primary means of delivering a military punch to achieve political gain. Since their first use in Operation Desert Storm, more than one hundred Tomahawk cruise missiles have been fired in battle in four separate instances: the January and June 1993 strikes in Iraq, the September 1995 strikes in Bosnia, and the September 1996 strikes in Iraq. As one U.S. Navy official notes,

After a century of 'gunboat diplomacy' and a half-century of manned aircraft as the delivery system of choice, the cruise missile ship has arrived as a preferred choice to accomplish a political objective by military means. Despots around the world have taken notice. That lone American cruiser or destroyer patrolling the nearby seas can be as lethal as an aircraft carrier conducting flight operations a few hundred miles away.<sup>1</sup>

Unmanned, the Tomahawk cruise missile is a "fire and forget" weapon. Its terrain contour matching (TERCOM), digital scene map area correlator (DSMAC), and global positioning system (GPS) guidance systems enable the cruise missile to fly relatively undetected at extremely low altitudes for approximately one thousand nautical miles and arrive at its target with deadly accuracy. Chapter II describes the current capabilities of Tomahawk, traces the evolution of the weapon system, and illustrates future development and employment plans for Tomahawk.

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<sup>1</sup> Vice Admiral Joseph Metcalf III, USN (Ret), former Commander U.S. Second Fleet and Deputy Chief of Naval Operations for Surface Warfare. Cited in Nicholas Sabalos Jr., "Weapon of Choice: Surface Warfare Strikes!," Surface Warfare 18, no. 5 (September/October 1993): 3.

The Tomahawk cruise missile offers the United States the option to strike targets deep inside an enemy's territory with precision accuracy and without the risk of losing pilots and multi-million dollar attack aircraft. Tomahawk provides a continual military option from the safety of naval platforms stationed off the coast of a potentially hostile nation without the political encumbrances that are tied to overseas air bases. With the exception of potential strategic targets deep in the heart of Europe and Asia, Tomahawk can reach nearly any potential target in the world, a point evidenced by Tomahawk strikes into Baghdad and the heart of Iraq through what had been considered as one of the most formidable air defenses outside of the former Soviet Union.<sup>2</sup>

The first time that the Tomahawk was developed sufficiently to be considered a realistic option was in response to the killing of 241 U.S. Marines in September 1983 by a terrorist truck bomb that exploded at the U.S. Marine barracks in Beirut, Lebanon. In addition to using the sixteen inch guns of the battleship New Jersey, the United States considered a Tomahawk missile strike on the Syrian Defense Ministry in downtown Damascus. However, "the proposal was turned down by the Deputy Secretary of Defense and the Chairman of the JCS. Tomahawk had to wait eight more years to humiliate its critics - in Baghdad rather than Damascus."<sup>3</sup> The second time that Tomahawk came close to its debut in combat was in response to Libyan terrorist activities in 1986. As yet unproven in actual combat, the Tomahawk option again was turned down in favor of a joint naval and air force manned attack aircraft strike. Such is the life of a new, unproven weapon system, and Tomahawk was no exception. Once it had demonstrated its

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<sup>2</sup> John Lehman, Making War (New York: Charles Scribner's Sons, 1992), 136-37.

<sup>3</sup> Ibid., 142-43.

capability during Operation Desert Storm in the Gulf War, Tomahawk quickly became the NCA weapon of choice for executing the military option in carrying out United States diplomacy when politicians resorted to violence.

Chapter III deals with the first post-Gulf War use of Tomahawk cruise missiles, which occurred in January 1993. In response to Iraqi defiance of United Nations (UN) resolutions calling for the inspection of Iraqi nuclear and chemical weapons facilities, the United States launched forty-two Tomahawk cruise missiles against the Zaafaraniyah industrial complex in Baghdad to coerce the Iraqi government to comply with all UN mandates and resolutions in full and in good faith as agreed to in the Gulf War Cease Fire. Iraq suffered the Zaafaraniyah strike as a result of its defiance and eventually capitulated.

Chapter IV explores the second use of Tomahawk cruise missiles which came in June 1993, and again involved the contumacious government of Iraq. President Clinton responded to the foiled Iraqi attempt to assassinate former President Bush during his visit to Kuwait as an honored guest of the Emir of Kuwait. The response was accurate, timely, and deadly. Twenty-three Tomahawk cruise missiles, fired from U.S. warships in the Red Sea and Persian Gulf, hit with lethal precision the Iraqi Intelligence building in Baghdad where the assassination plot had been planned. The Tomahawk strike could not have been more appropriate. As the assassination plot had been uncovered and foiled prior to its execution, the U.S. response was intended to send an unequivocal message not only to the Iraqi leadership, but also to the rest of the world: the United States can and will respond to any act of aggression against the United States, its citizens, and its interests.



Chapter V examines the third use of Tomahawk cruise missiles after the Gulf War in September 1995. In response to the obstinate Bosnian Serb leadership which had thus far failed to yield to UN and North Atlantic Treaty Organization (NATO) demands, NATO warplanes in conjunction with thirteen U.S. Tomahawks fired from warships in the Adriatic Sea attacked Serb targets in Bosnia. The purpose of the attack was to bring the Bosnian Serbs into compliance with UN mandates that had gone unheeded.

Chapter VI looks at the fourth use of cruise missiles, a strike of thirty-one Tomahawks and thirteen air-launched cruise missiles, that came following Iraqi incursions into northern Iraq against the Kurdish population under the protection of coalition forces enforcing "no-fly zones" over Iraq. Faced with a recalcitrant Iraqi president in a U.S. presidential election year, coupled with the decision to attack air defense sites in southern Iraq that were threatening allied war planes in the southern "no-fly zone" instead of the Iraqi troops that were the source of the problem in northern Iraq, the Clinton Administration intended to deliver a political message to Saddam Hussein. The administration's intent was to coerce Iraq into ceasing hostilities aimed at the Kurds in northern Iraq, at allied warplanes over southern Iraq, and to deter Iraq from threatening its neighboring countries to the south.

### **Long-term Implications**

Other than a handful of articles and editorials, thus far little has been written on this important subject. As the Institute for National Strategic Studies 1996 Strategic Assessment indicates,

Area bombing, naval gunfire, and rocket fire have been superseded by the use of 'smart bombs,' cruise missiles, and other precision guided munitions.

Accurate strikes on military targets reduce the possibility of collateral damage, that is, unintended civilian casualties or destruction of non-military targets. The growing ubiquity and versatility of television technology and the appearance of international broadcasting networks have given the public the ability to observe the results of bombardments carried out by their forces. Precision strikes greatly lessen the chances that television viewers will be presented with disturbing images of civilian dead, wrecked hospitals, or burning houses of worship caused by U.S. bombs. The reduction of such damage by bombardment, compared with that inflicted by U.S. forces in World War II or even the Vietnam War, also lessens the chances that outraged international opinion can be mobilized against the U.S. government.<sup>4</sup>

The choice to use Tomahawks over manned attack aircraft armed with precision-guided weapons that have the same (or more) deadly accuracy as the Tomahawk cannot be overlooked or overstated. The consequences, both political and military, of repeated Tomahawk strikes have yet to be fully appreciated or understood. The American Congress and media have relatively short attention spans. In recent years they have had limited tolerances for the involvement of U.S. troops overseas when that involvement has resulted in U.S. loss of life. This is evidenced by the public outrage that ensued over the loss of U.S. military personnel in Somalia in 1993. Tomahawks have thus far been tools that the NCA has used to attempt to exploit those constraints on its ability to exercise the military option in U.S. foreign policy. Constantly aware of public opinion regarding U.S. military involvement overseas, both in the Congress and in the media, and the sensitivity of public opinion to U.S. casualties, seemingly "risk-free" cruise missile strikes enable the NCA to take quick and decisive military and political action in response to regional crises without much danger to U.S. military personnel. Thus far, no reprisals against Tomahawk

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<sup>4</sup> Strategic Assessment 1996: Instruments of U.S. Power (Washington D.C.: National Defense University, 1996), 164-65.

launch platforms have been attempted. Neither Iraq nor Bosnia has had the capacity to strike back at U.S. launch platforms.

One potential consequence of unrestricted Tomahawk use is the possibility that the American public will begin to think that all future military encounters in regional conflicts can and will avoid U.S. casualties. Another potential consequence is that the virtual impunity with which the United States can launch Tomahawk strikes will lead to a new form of gunboat diplomacy, *cruise missile diplomacy*, where the United States is relatively quick to exercise the military option in regional crises prior to exhausting all other methods of negotiations and coercive diplomacy.

### **Implications for Weapons Proliferation**

Since their advent in the early 1990's as tools of diplomatic and political persuasion, Tomahawk cruise missiles have empowered U.S. decision makers and crisis managers with the capability to exercise the military option with little risk to U.S. forces when other diplomatic efforts failed or were perceived to have little coercive power. This capability will soon be extended to the United Kingdom, who is currently purchasing the weapon system from us. Other nations may follow suit either by pressing the United States to share the Tomahawk advantage with them or by pursuing advanced cruise missile technology on their own.<sup>5</sup> Australia has exhibited interest in obtaining Tomahawk technology.<sup>6</sup> Yet, the sale of Tomahawks to foreign navies has potential negative implications for the further proliferation of conventional weapons that use

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<sup>5</sup> See Appendix A: "The British Tomahawk Sale"

<sup>6</sup> "Australia Reviews Tomahawk," Jane's Defence Weekly 26, no. 11, 11 September 1996, 21.

advanced technology. With the exception of GPS guidance and the satellite intelligence resources that are an integral part of U.S. Tomahawk technology, cruise missile technology is not new and is not out of reach of most industrialized nations. First-generation cruise missiles are currently in the inventories of such nations as China and India.<sup>7</sup>

Cruise missile technology has the potential to become the most sought after weapon technology, second only to the pursuit of technology regarding weapons of mass destruction. So long as the United States continues to flex the military muscle of its diplomatic arm with little risk to U.S. forces by employing Tomahawks around the world, and once other states see the added “political-military advantage” that Tomahawks give to a medium sized navy like the British Royal Navy, cruise missiles could become the envy of most nations.

### **Implications for the Future of U.S. Air Power and Diplomacy**

Cruise missiles are yet another form of aerial bombardment in the continuing evolution of strategic air power. However, the attraction of aerial bombardment as a “less costly” form of modern warfare is not a new concept. Following the Second World War, many military and political strategists thought of air power in the form of strategic aerial bombardment as the way of the future, the path to more limited and shortened conflicts.<sup>8</sup> As yet, aerial bombardment as the preferred method of warfare has failed to end all other forms of warfare as necessary to achieve victory over an opponent, whether in a

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<sup>7</sup> Ibid.

<sup>8</sup> Edward N. Luttwak, Strategy: The Logic of War and Peace (Cambridge: Harvard University Press, 1987), 90.

limited sense or in a larger context as evidenced by the 1991 Gulf War. In the war against Iraq in 1991, even absolute air supremacy was not decisive enough to achieve victory over Saddam Hussein.<sup>9</sup>

As the following chapters will demonstrate, the United States has embarked upon a new form of gunboat diplomacy in the 1990's, *cruise missile diplomacy*. Taken individually, it would be difficult to show that this has indeed been the case. However, upon closer examination and when taken in the aggregate, one cannot help but recognize through these examples that the United States has embarked upon a similar course of action in handling a variety of different foreign policy issues. This familiar course of diplomacy has potential repercussions for the United States, both political and military, in terms of the future employment of Tomahawk cruise missiles.

Encouraging the notion that cruise missiles and other "smart" weapons are a sort of military weapon panacea with which policy and decision-makers can avoid political risk and bloodshed would be a grave mistake. Yet, this is exactly what is happening with the current U.S. affinity for "bloodless" weapons like the Tomahawk. In warfare, offensive weapons generally enjoy a period of invincibility; however, this advantage is always short lived. An effective defense to cruise missile technology has yet to be realized, but this convenience will not last long. Once an effective defense has been developed, what then for the current U.S. affinity for the employment of Tomahawks? An effective defense to cruise missiles could severely limit U.S. crisis response options and hamper U.S. efforts at coercive diplomacy and implementing effective foreign policy. No longer able to deliver a

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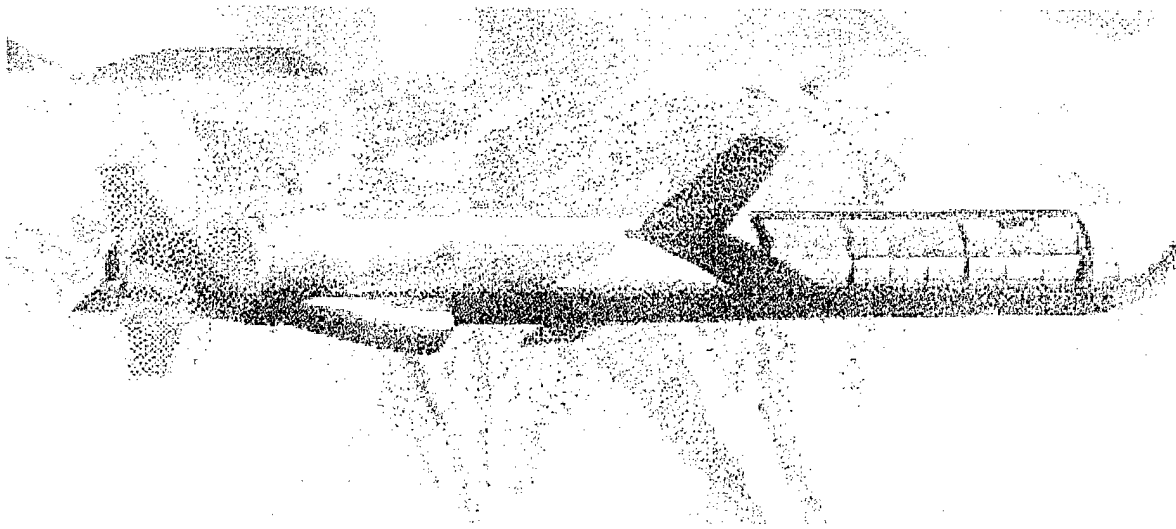
<sup>9</sup> Strategic Assessment 1996: Instruments of U.S. Power, 165-66.

military punch with impunity, the United States could be forced to pursue other less attractive methods of coercive diplomacy, lessening U.S. hegemony, influence over regional powers, and control over developing crises.



## II. THE TOMAHAWK WEAPON SYSTEM

The Tomahawk land attack cruise missile, as depicted in Figure 1, has matured significantly as a conventional weapon system. Since its debut in the 1991 Gulf War, Tomahawk has undergone several upgrades to its capabilities and is planned to undergo several more, including improvements still under development. The United States has made an enormous investment in this weapon system, and all indications point to a continued commitment by the Navy to see the continued development of this much heralded weapon system and further adaptation to fleet operations, such that Tomahawk and its evolutionary descendants will continue to serve as the NCA's "weapon of choice." This commitment, however, is not without cost, both in dollar amount and direction, as the Navy and the United States enter a most uncertain twenty-first century.



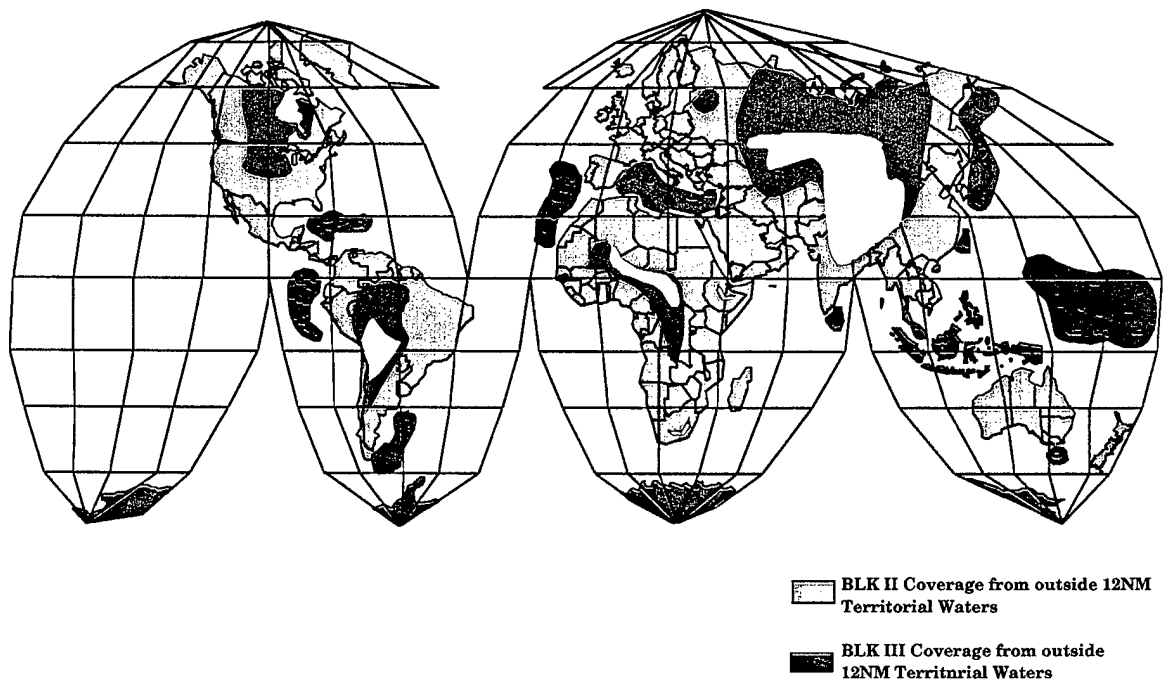
**Figure 1. Tomahawk (TLAM-D) Cruise Missile in Flight.**

(U.S. Navy photo)



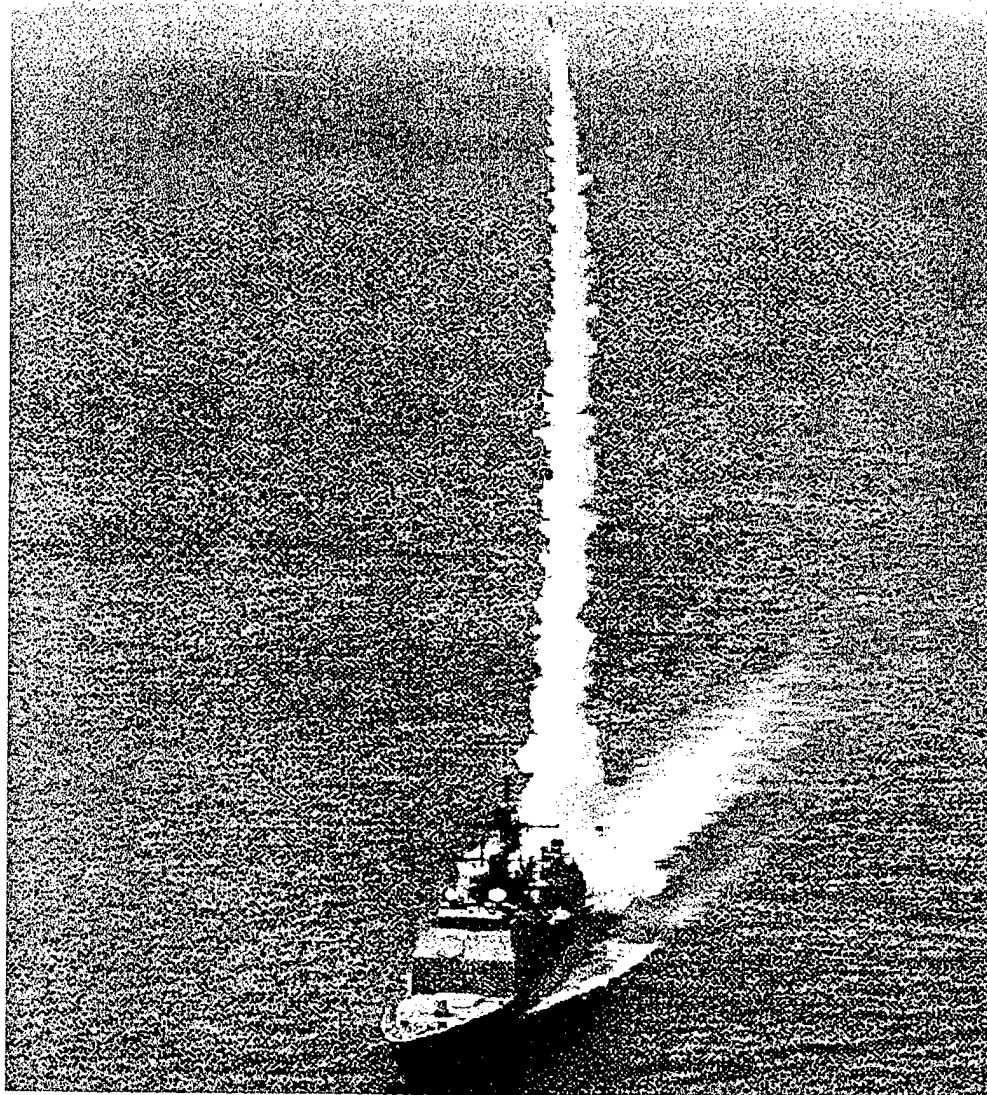
## Weapon System Description

Unmanned, the Tomahawk cruise missile is a "fire and forget" weapon. Its terrain contour matching (TERCOM), digital scene map area correlator (DSMAC), and global positioning system (GPS) guidance systems enable the Tomahawk cruise missile to fly relatively undetected at extremely low altitudes for approximately 1000 nautical miles and arrive at its target with deadly accuracy. The Tomahawk cruise missile provides the United States the option to strike targets deep inside an enemy's territory with precision accuracy. With its increased range, the latest version of Tomahawk, the Block III, can reach virtually any potential target anywhere in the world with the exception of strategic targets deep in the heart of Europe and Asia as depicted in Figure 2.



**Figure 2. Tomahawk Worldwide Coverage.** (Graphic courtesy of the Program Executive Office: Cruise Missiles and UAVs, Washington DC)

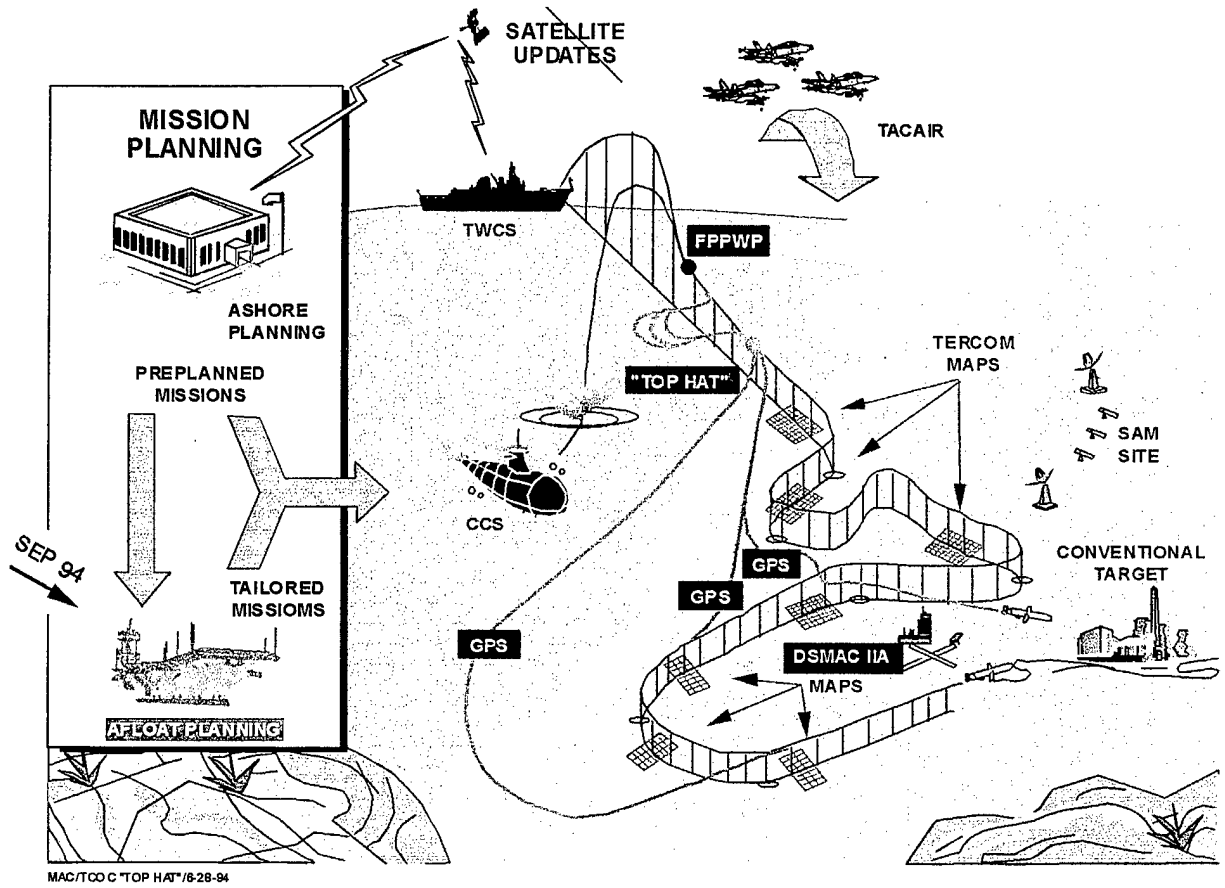
The updates to the Block III Tomahawk are numerous and greatly enhance its performance and utility. Launched vertically, as depicted in Figure 3, from surface ships and submarines, the Tomahawk's rocket booster accelerates the cruise missile vertically to an altitude of several hundred feet until the missile reaches its level, cruise-flight altitude and the missile's turbo-fan engine takes over propulsion.



**Figure 3. A Vertical Launch of a Tomahawk Cruise Missile. (U.S. Navy photo)**

In the Block III version of Tomahawk range has been extended from 750 to approximately 1000 nautical miles through a more efficient turbo-fan engine and increased fuel capacity made possible by a smaller, but equal in explosive power, 700 pound high explosive warhead (C version, the D version utilizes bomblet dispersion). Guidance has been improved through the inclusion of Global Positioning System (GPS) navigation hardware, an updated Digital Scene Map Area Correlator, and new time-of-arrival software. While still maintaining all of the capability of the Block II missile, the improvements in the Block III Tomahawk cannot be over emphasized in terms of their strategic value to decision makers.

The benefit obtained from increased range is obvious. However, unlike the Block II Tomahawk that was designed to rely on terrain contour matching guidance (TERCOM) to arrive at its target, GPS enables a Tomahawk to follow more precisely virtually any desired path to its target. One of the drawbacks to TERCOM guidance, as found in the desert environment, is that without a large number of significant terrain features (mountains, lakes, highways, buildings, etc.) TERCOM guided Tomahawks must follow relatively the same path to a particular target, thereby limiting the number of potential targets, increasing the chance of missile attrition, and minimizing the surprise and explosive power of a multiple missile salvo. Additionally, the upgraded DSMAC will improve targeting accuracy. And finally, time-of-arrival software enables decision makers to further increase the number of missiles that arrive at a target or multiple targets at a designated time, regardless of weather influences and distances traveled by missiles launched from multiple platforms in different locations (e.g., the Red Sea and Persian Gulf), further increasing the element of surprise of a Tomahawk strike as illustrated in Figure 4.

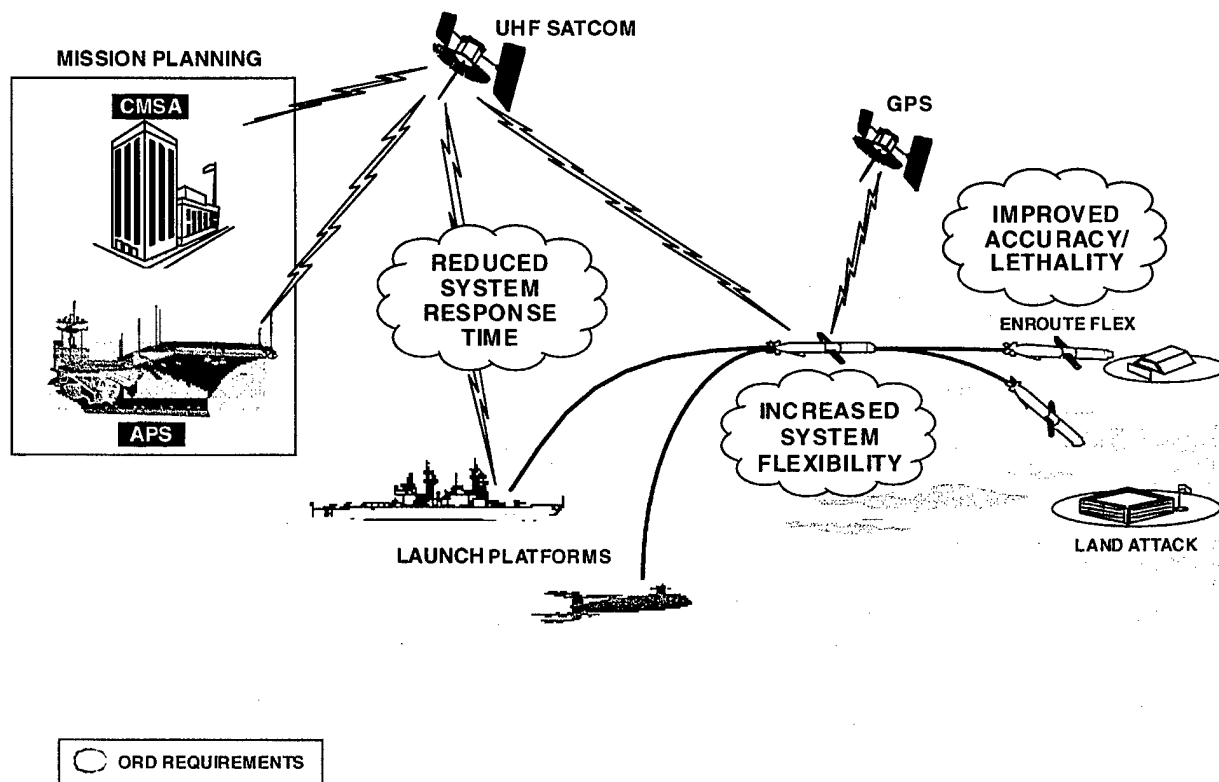


**Figure 4. Tomahawk Flight Profile.** (Graphic courtesy of the Program Executive Office: Cruise Missiles and UAVs, Washington DC)

Additional improvements to the Tomahawk weapon system include a software upgrade, the Precision Strike Tomahawk (PST), that enables the missile to continually monitor itself in flight and its ability to successfully reach its target, thus further reducing the likelihood of collateral damage.<sup>10</sup> Also as part of the Tomahawk Baseline Improvement Program (TBIP), Tomahawk will incorporate man-in-the-loop (MITL) and two-way satellite data-link features in the Block IV version, enabling Tomahawk to

<sup>10</sup> LCDR Kevin Baxter, USN, "Tomahawk: Better Than Ever," *Surface Warfare* 19, no. 3 (May/June, 1994), 20, 24.

engage movable targets such as mobile missile launchers.<sup>11</sup> The Afloat Planning System (APS), presently undergoing at-sea testing aboard forward deployed aircraft carriers, will provide afloat and theater commanders the capability to plan complete Tomahawk strikes from their forward deployed aircraft carriers. The introduction of APS will greatly reduce Tomahawk strike planning time and better facilitate coordinated cruise missile and TACAIR strikes. Figure 5 graphically depicts this improved mission flexibility.



MAC/TBIP ORDS #(HP)2/08-05-96

**Figure 5. Tomahawk Baseline Improvement Program (TBIP).** (Graphic courtesy of the Program Executive Office: Cruise Missiles and UAVs, Washington DC)

<sup>11</sup> Ibid.

## Current and Planned Procurement

In support of the NCA and CINC requirements, the Navy has made an enormous commitment to the future of Tomahawk with a current planned procurement objective of 3,440 Block III and IV Tomahawks at roughly one-million dollars a copy. Current procurement plans also call for the remanufacture of 1,253 Block II TLAMs and TASM (Tomahawk Anti-Ship Missile variant) into Block IV missiles.<sup>12</sup> The Navy is also currently studying the inclusion of the ability to hit moving targets into Tomahawk, incorporating Brilliant Anti-armor Technology or Search and Destroy Armor submunitions, utilizing U.S. Army developmental programs.<sup>13</sup> Additional programs currently under development or under consideration for incorporation into the Tomahawk weapon system include dual 300-400 pound penetrators capable of penetrating 10-15 feet of reinforced concrete.<sup>14</sup> Another possibility for improved accuracy and decreased mission planning time will be the ability to incorporate synthetic aperture radar (SAR) images gathered by reconnaissance satellites and aircraft into cruise missile targeting. Converting photographic images to digital scenes for use in Tomahawk's DSMAC presently takes about six hours according to an aerospace industry official. Decreases in Tomahawk mission planning time increase the attractiveness of this weapon as a tool to be used in a crisis response where time is of the essence.<sup>15</sup> And finally, with plans moving forward on

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<sup>12</sup> John W. Townes III, "Surface Strike: The Powerful Punch of Deterrence," Surface Warfare 22, no. 1 (January/February 1997), 19.

<sup>13</sup> Ibid.

<sup>14</sup> Michael O. Lavitt, "Harder Hitting Tomahawk Warhead," Aviation Week and Space Technology 138, no. 12, 22 March 1993, 13.

<sup>15</sup> David A. Fulghum, "Satellite Radars To Guide Missiles," Aviation Week and Space Technology 145, no. 14, 30 September 1996, 33.

the navy's "Arsenal Ship," in all likelihood Tomahawk will continue to be viewed as the "weapon of choice" for the NCA and theater commanders for the foreseeable future. The Arsenal ship, the Navy's newest surface ship currently under development, will have the ability to carry as many as 500 cruise missiles, almost five times the carrying capacity of a Ticonderoga class guided missile cruiser, which typically devotes a significant portion of its magazine space to carrying surface-to-air missiles. Poised at a safe distance off the coast of a potential "hot spot," the Arsenal ship concept is designed to make maximum usage of smart weapons like Tomahawk and enables the NCA to respond to a crisis with highly accurate and lethal firepower.<sup>16</sup>

All of the incorporated and planned improvements to the Tomahawk weapon system will greatly enhance Tomahawk's utility to theater commanders and the NCA. With improved lethality, accuracy, range, tactical options, and reduced mission planning time and less likelihood of collateral damage, Tomahawk will continue to be the NCA's "weapon of choice" for the foreseeable future. Further developments, like the Arsenal ship concept, will only serve to solidify the preeminence that cruise missiles and cruise missile platforms have attained since the 1991 Gulf War.

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<sup>16</sup> The Arsenal ship concept is also being designed to have an extremely small crew, as compared to today's standards, incorporating the latest in automation and stealth technologies.

### III. THE JANUARY 1993 STRIKE : IRAQ

In the early evening hours of 17 January 1993, forty-two Tomahawk cruise missiles (all TLAM-C), fired from three surface ships in the Persian Gulf and one surface ship in the Red Sea, made their way to the Zaafaraniyah industrial site in a suburb of Baghdad, Iraq -- a facility suspected of containing nuclear weapon component building materials for Iraq's illustrious nuclear weapons program. The Tomahawk strike came following Iraq's refusal to allow UN inspectors to examine the plant and Iraq's failure to ensure the UN inspectors' safety once they were finally permitted to inspect the facility.

The 17 January 1993 Tomahawk strike is significant for several reasons. First, it demonstrated the first use of cruise missiles subsequent to the 1991 Gulf War. Second, the facts surrounding the justification for the Tomahawk strike were widely disputed. Third, the strike came just days before the inauguration of a new American president. And finally, the results of the strike, both political and military, were inconclusive. The Zaafaraniyah Tomahawk strike stands as an interesting example of the continuing evolution of air power, and it marks the dawn of the age of *cruise missile diplomacy*.

According to the International Atomic Energy Agency (IAEA), the Zaafaraniyah facility had been suspected of manufacturing uranium enrichment equipment, used in the construction of nuclear weapons.<sup>17</sup> Zaafaraniyah was not currently producing nuclear weapons components at the time of the strike; however, there had been speculation that the facility would soon return to full production once the economic embargo against Iraq,

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<sup>17</sup> David A. Fulghum, "Clashes with Iraq Continue After Week of Heavy Air Strikes," Aviation Week and Space Technology 138, no. 4, 25 January 1993, 38.



in place since the 1991 Gulf War, was ended.<sup>18</sup> There was no dispute that Zaafaraniyah had at one time been involved in Iraq's nuclear weapons program. Yet, there were substantiated claims that all the equipment at the facility involved in the manufacture of nuclear weapons had previously been destroyed by UN inspection teams during earlier visits to the facility.<sup>19</sup> Without a clear indication that the Zaafaraniyah facility was undeniably a viable facility worthy of a military strike, as would be evident to the international community, the effects of the strike are, therefore, unsurprisingly as equally obscured and inconclusive.

The cruise missile strike on Zaafaraniyah had mixed results, both in terms of damage infliction and international political fallout. Of the cruise missiles that successfully transitioned to cruise-flight, seven missiles missed their intended targets for various reasons. The remaining missiles managed to impact buildings at the Zaafaraniyah facility, their one-thousand pound warheads causing severe damage. One of the errant missiles, apparently damaged by anti-aircraft fire, impacted in the lobby of the Al Rashid hotel in Baghdad, killing two people. Another off-target missile killed one person when it landed in a Baghdad suburb.<sup>20</sup> While potential casualties are always a concern for political and military planners, the killing of innocent civilians in a military strike has more serious ramifications in the international political arena. Civilian casualties draw attention away from the signal that a military strike is intended to give and instead focus negative

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<sup>18</sup> Simon Edge, "Saddam Survives Parting Shot; George Bush's Campaign Against Saddam Hussein During His Last Days of Office," *MEED Middle East Business Weekly* 37, no. 4, (1993), 4.

<sup>19</sup> According to a published report by Rolf Ekeus, the head of the UN commission responsible for the dismantling of Iraq's nuclear weapons manufacturing capability. *Ibid.*

<sup>20</sup> "A Missile Too Many?" *The Economist*, U.K. Edition, 23 January, 1993, 37.

attention on the power inflicting the punishment. The Zaafaraniyah strike was no exception.

The international political fallout from the January 17 cruise missile strike on Zaafaraniyah was less than favorable for the United States. Much of the hesitant and waning support of U.S. action taken against Iraq was a direct result of the doubt surrounding Zaafaraniyah's viability as a nuclear weapon components facility. Additionally, many of the more temperate U.S. allies took issue with what they perceived as a U.S. double standard regarding enforcing UN mandates and resolutions, specifically in reference to Bosnian and Israeli failed compliance.<sup>21</sup>

Given the cloud of uncertainty and doubt surrounding the justification for the 17 January attack on Zaafaraniyah, the real intentions of the cruise missile strike were not readily apparent to the casual observer. If the intention was mere punishment for Iraq's refusal to comply with UN resolutions and failure to guarantee inspectors' safety, then the motive to strike Iraq was shrouded by the fact that there existed significant doubt surrounding the actual and potential capability of the Zaafaraniyah facility. If the U.S. intention was to coerce Iraq into complying with unheeded UN sanctions and mandates, it is impossible to decipher from between the 17 January cruise missile strike and the numerous other attack aircraft strikes that occurred in Iraq during the month of January. Additionally, it is impossible to determine which attacks had the most political impact on the Iraqi government, or even if there was any impact at all.

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<sup>21</sup> Edge, "Saddam Survives..." 5; and "A Missile Too Many?" 53.

January 1993 saw repeated manned attack aircraft strikes against Iraq for Iraq's refusal to comply with allied "no-fly zones" and repeated Iraqi attempts to destroy allied aircraft flying patrols in the "no-fly zones."<sup>22</sup> Why then the decision to use cruise missiles for the Zaafaraniyah strike? "The main purpose of the attack, it seems, was to carry the political and psychological message that Baghdad itself was in danger from Mr. Hussein's defiance."<sup>23</sup>

The selection of cruise missiles over manned attack aircraft to execute the 17 January strike on Zaafaraniyah can not be overstated. Supporting the use of cruise missiles was the fact that the Zaafaraniyah facility was located in a Baghdad suburb. Outside of allied "no-fly zones" and in close proximity to innocent Iraqi civilians, the decision to use cruise missiles could not have been more purposeful. To send manned attack aircraft to destroy such a facility would have put allied pilots at risk and innocent Iraqis at greater risk. Entering Iraqi airspace over Baghdad would have certainly guaranteed an Iraqi attempt at air defense which could have brought down a pilot and an allied aircraft over populated areas. As it was, one of the cruise missiles crashed into the Al Rashid Hotel, apparently a victim of Iraqi anti-aircraft fire, and another impacted in a suburb. While the flight profiles of cruise missiles and attack aircraft are vastly different and a direct comparison can only be hypothesized in terms of what could have or would have occurred had attack aircraft been used instead of Tomahawks in the 17 January

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<sup>22</sup> Two air strikes against Iraqi air defense sites on 13 and 18 January, utilizing more than 100 aircraft from the U.S. Air Force, U.S. Navy, U.K. Royal Air Force, and French Air Force. January, 1993 also saw several engagements between allied aircraft and Iraqi aircraft and SAM sites. John Boatman and Paul Beaver, "Coalition Draws New Line in the Sand," *Jane's Defence Weekly* 19, no. 4, 23 January 1993, 6.

<sup>23</sup> "A Missile Too Many?" 53.

strike, one thing is still certain: the potential fallout, both in terms of negative U.S. and international public opinion or Iraqi exploitation of the situation, from a downed aircraft and captured pilot, would have been far greater than that which was felt by the collateral damage and deaths at the Al Rashid.

Politically and militarily, the 17 January cruise missile strike on Zaafaraniyah is difficult to justify. Internationally, U.S. motivations for the strike were ineffectively supported by U.S. allegations about the capability of Zaafaraniyah to produce nuclear weapon components. The perceived double standard with which the United States enforced UN mandates and resolutions, the month-long barrage of allied aircraft attacks against Iraqi air defenses, and the loss of innocent civilian life also did not fair well with the international community. The implications to be gleaned from the "political debut" of cruise missiles in the January 17, 1993, strike on Zaafaraniyah are far reaching. The Zaafaraniyah strike marked the true dawn of the cruise missile age and gave rise to a new chapter in the evolution of strategic air power.



#### IV. THE JUNE 1993 STRIKE : IRAQ

Just past midnight on 27 June 1993, twenty-three Tomahawk cruise missiles flew to Baghdad, Iraq from two surface ships, one positioned in the Red Sea and the other in the Persian Gulf; their target -- the central intelligence headquarters building of the Iraqi government. The strike was in retaliation for the foiled Iraqi assassination attempt on former president George Bush during his April visit to Kuwait as the honored guest of the Emir of Kuwait. This strike was intended to deliver a political message to the Iraqi leadership and to other would be despots around the world: the United States can and will respond to any act of aggression against the United States, its citizens, and its interests anywhere in the world. There were other options available to the NCA, but none would have delivered the political message as cleanly as the cruise missile option. The June 27 Tomahawk strike is significant for more than the political message it was intended to deliver. This cruise missile attack on Iraq has lasting implications for the strategic use of air power and gunboat diplomacy.

Of the twenty-three Tomahawks fired, sixteen found their targets. Of the seven cruise missiles that missed their targets, three impacted in a nearby residential neighborhood killing at least six civilians.<sup>24</sup> Four of the Tomahawks that missed their intended aim points impacted in and around the Iraqi Intelligence headquarters

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<sup>24</sup> One of those killed was a well known Iraqi artist, Layla al-Attar. Her husband was also reportedly killed in the attack. Robert Marshall "Don't Tread on Us," Maclean's, 5 July 1993, 16.

compound.<sup>25</sup> As a result, the June 27 cruise missile strike only achieved a sixty-seven percent success rate. Yet, by political and military standards the Tomahawk raid was still considered successful.

While only achieving a sixty-seven percent success rate, compared to the eighty-five percent success rate achieved by the earlier Zaafaraniyah Tomahawk raid, the success rate of the Iraqi Intelligence headquarters strike is considered successful for unmanned weapon systems according to U.S. defense officials.<sup>26</sup> In a military strike that is intended to deliver a political message as the June strike was intended to do, what counts most is how such a strike is received by the intended audience. In order to impress upon world opinion the right of the United States to act freely and independently to protect its interests, President Clinton invoked Article 51 of the UN charter, a nation's right to self defense. Additionally, to defend his retaliation, "he reached back to an older and less subtle principle: 'From the first days of our Revolution,' he said, 'American security has depended on the clarity of this message: Don't tread on us.'"<sup>27</sup> This angle on self-defense fared well in America, in the American media, and with U.S. allies.

In order to justify the act of self-defense, the United States had to first prove that there was in fact an assassination plot against former President Bush. As was also the case with the attack on Libya in 1986 when the United States tied the Libyan government to a bombing in a Berlin discotheque targeted at U.S. servicemen, the United States relied

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<sup>25</sup> The missed aim points were later attributed to small measuring errors (imagery misalignment) made during the DSMAC targeting process of mission planning, a CMSA task. David A. Fulghum "Low Tomahawk Kill Rate Under Study," Aviation Week and Space Technology 139, no. 1, 5 July 1993, 25.

<sup>26</sup> Ibid.

<sup>27</sup> James Collins, "Striking Back," Time, 5 July 1993, 20.

on its national intelligence organizations to provide the connection between the Iraqi government and the assassination plot. The evidence was indisputable, tying at least fourteen Iraqis and Kuwaitis to the assassination plot and implicating Iraqi leadership directly. FBI and CIA sources had confirmed the evidence in interviews with those under investigation by Kuwaiti justice officials and through independent FBI and CIA analysis. Politically beset in the United States by economic problems, declining approval ratings, and doubt overseas about his leadership ability, it could be argued that President Clinton was compelled to respond with some form of reciprocity.<sup>28</sup> The president's method of reprisal came in the form of twenty-three Tomahawks. Every effort was made to minimize the possibility of Iraqi casualties and for the most part this was achieved.

International opinion was largely supportive of the U.S. attack. However, an even more important question remains than the question of the often fickle international opinion. Was the cruise missile strike on the Iraqi intelligence headquarters really the best method of delivering the message that the NCA wished to deliver, and as U.S. Secretary of Defense Aspin so directly said concerning Saddam Hussein that "following this man is not good for your health,"<sup>29</sup> or was there a better way of sending a more appropriate political message in light of the circumstances? Is destroying buildings the best method of retaliating against *people* who plot against U.S. leaders? The political message delivered by the Tomahawks had as its intended audience the political elites in Iraq who assist Saddam Hussein's decision making, and as such, its intent was to influence future decisions that those elites may make. No one can say for certain whether or not that

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<sup>28</sup> Marshall, "Don't Tread on Us," 16.

<sup>29</sup> Collins, "Striking Back," 20.



message had its intended impact. Analysts and policy makers can only speculate. But what of the innocent civilians killed during retaliation? In the court of public opinion casualties weigh heavily against retaliation that takes innocent lives, and it is obvious from the time of the strike and the target selection that this maxim was an important gauge of determining what would be an appropriate and tolerable U.S. response to the foiled assassination attempt. A better question to ask might be -- what would the U.S. response have been had the assassination attempt been successful? What target would the U.S. then have chosen? What strategic target (or targets) would the United States then have chosen to destroy? Perhaps the United States would have retaliated by targeting Saddam Hussein himself.

By responding to the assassination attempt with a cruise missile attack on an empty building in the dark of night, the United States has given new meaning to gunboat diplomacy. At the very least, "the Tomahawk strike on Baghdad by surface ships *alone* is the beginning of a new era in naval operations."<sup>30</sup> Yet, more than beginning a new era in naval operations, the June 27 cruise missile strike ushered in a new era in diplomacy, the era of *cruise missile diplomacy*.

Cruise missiles offer the NCA the ability to strike militarily with little or no warning and at present with relative impunity to counter-attack. As a result of the Gulf War, Iraq has been without a navy and "no-fly zones" have covered virtually all of Iraq since 1991. As such, Saddam Hussein has not had the ability to strike at Tomahawk

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<sup>30</sup> According to Vice Admiral William H. Rowden, USN (Ret), former Commander Sixth Fleet, Assistant Chief of Naval Operations for Surface Warfare, and COMNAVSEA. Cited in Sabalos, "Weapon of Choice: Surface Warfare Strikes!" 3.

platforms positioned in the Persian Gulf and Red Sea and has been relatively defenseless against cruise missile attacks. For the foreseeable future this U.S. advantage is likely to remain intact, but as most advantages are only temporary, the U.S. ability to deliver cruise missiles with impunity from the security of naval platforms stationed safely off the coast is likely to be only temporary. Certainly with respect to Iraq, at some point in the future the allied air patrols keeping a tight reign on Saddam Hussein's air force will eventually come to an end.

If Iraq had had the ability to patrol its adjacent waters and defend against a naval attack, the stakes in the June strike would have been much different. Down in the polls at home and faced with allies that questioned his ability to lead the free-world, President Clinton had little choice but to respond immediately, even if this meant launching unmanned cruise missiles at empty Iraqi buildings from the security of U.S. Navy ships in the Red Sea and Persian Gulf. The president had no viable alternative. To allow the Kuwaiti justice system time to run its course with the accused would have meant that the U.S. did nothing in response. Attempts to try and impose further economic sanctions on Iraq would have assuredly been hamstrung in the United Nations and would certainly have proved an inadequate punishment as Iraq was still under sanctions imposed as a result of Iraq's 1990 invasion of Kuwait. To deliver more ordnance with manned attack aircraft and attempt to entirely destroy the Iraqi intelligence headquarters would have risked losing American lives and would have created another political dilemma for the president had a pilot been captured. To attack in the middle of the day in an attempt to hit those Iraqis who actually helped mastermind the assassination plot would hardly have guaranteed that

those responsible would have been killed. It would assuredly have resulted in a higher body count than that which occurred during the night time raid. There would have been more Iraqis in the targeted area and an increased susceptibility of the cruise missiles to anti-aircraft fire during daylight hours, as was the case with the missile that impacted into the Al Rashid hotel, which killed two civilians during the 17 January attack on the Zaafaraniyah nuclear fabrication facility.

Given the circumstances and Clinton's reputation as the leader of the free-world at stake, the NCA had no other choice but to launch a cruise missile attack against Iraq. Still, the danger exists that just such an attack will become the norm in future contingencies requiring a swift military response. The United States did not demolish the Iraqi intelligence headquarters as could have been achieved with manned attack aircraft or possibly a much larger salvo of cruise missiles. Instead, the United States delivered a purely symbolic message, but at what cost?

Conventional Tomahawk cruise missiles are being used to hit strategic targets and as substitutes for manned attack aircraft. However symbolic the 27 June Tomahawk strike may have been intended to be to Iraq and the rest of the world, hitting the Iraqi intelligence headquarters was an attempt to hit an Iraqi "center of gravity." It was a strategic use of air power. Like the Zaafaraniyah raid, the decision to use cruise missiles over manned attack aircraft in the 27 June strike should not be overlooked, nor can it be over emphasized in terms of its strategic consequences to the evolution of air power and gunboat diplomacy. Cruise missiles have the potential to make more traditional methods of gunboat diplomacy obsolete. Just the like "the little boy who cried wolf," no longer

will adversaries be affected by the mere presence of naval vessels. Instead, adversaries will come to expect that the presence of cruise missile capable vessels stationed off their coasts as a prelude to attack, and thus perceive them as a continual threat. Some nations already view the manner in which the United States conducts itself in foreign matters as a threat and have begun to take measures that will seriously challenge the way in which the United States conducts future operations at sea and in response to crises.

Iran, for example, has been acquiring diesel submarines in an effort to bolster its naval forces.<sup>31</sup> Such modernization will only serve to better protect Iran's regional interests, ultimately challenging U.S. hegemony in the Persian Gulf.<sup>32</sup> The 27 June Tomahawk strike on the Iraqi intelligence headquarters building was enormously politically successful in the short-term, but at what long-term political and military cost? Saddam Hussein still heads Iraq and continues to defy United Nations mandates and resolutions. Iraq still presents a destabilizing force in the Persian Gulf region, and the United States continually stands poised to launch cruise missiles at Iraq on a moment's notice. A swift military response in the form of cruise missiles may answer immediate short-term political goals, but a quick cruise missile response may also make future political objectives more difficult to attain through military means alone.

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<sup>31</sup> "Third Kilo Delivered to Iran's Gulf Naval Base," *Jane's Defense Weekly* 27, no. 4, 27 January 1997, 16.

<sup>32</sup> Eric R. Jones, "The Proliferation of Conventionally-Powered Submarines: Balancing U.S. Cruise Missile Diplomacy? The Cases of India and Iran" (Master's Thesis, Naval Postgraduate School, Monterey, June 1997).



## V. THE SEPTEMBER 1995 STRIKE : BOSNIA

In the early evening hours on 10 September 1995, thirteen Tomahawk cruise missiles launched from a guided missile cruiser in the Adriatic Sea made their way to Serbian air defense targets in the war torn former Yugoslavia. The cruise missiles were launched as part of a much larger operation designed to destroy the Serbian air defense network which had been firing at NATO aircraft over the Bosnia-Herzegovina theater of operations in the preceding months. The significance of this cruise missile attack is three-fold: first, it was part of a larger air attack (Operation Deliberate Force) that included Navy, Marine Corps, and Air Force attack aircraft, second, the air attack was politically motivated, and third, the selection of targets specifically suited the political utility of cruise missiles.

Operation Deliberate Force had two purposes: to bring the Bosnian Serbs into compliance with the NATO demand to stop shelling UN safe areas, and to bring Serb leaders to the negotiating table. The air attack came on the heels of a Bosnian Serb mortar attack which killed thirty-eight people at an outdoor market in Sarajevo and served as the final straw that broke NATO patience.<sup>33</sup> NATO commanders were selective in choosing Serb targets, avoiding politically sensitive targets, those with close proximity to civilians, or those that would kill large numbers of soldiers.<sup>34</sup> Ratko Mladic, the Bosnian Serb military chief, had refused to withdraw Serb heavy weapons from within twelve miles of

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<sup>33</sup> Suzanne Chapman, "Air Campaign Was 'Stellar Performance,'" Air Force Magazine (November 1995): 15.

<sup>34</sup> "Ratko Refuses to Leave the Sinking Ship," The Economist, 16 September 1995, 57.

Sarajevo, another NATO demand. Speculation was that Mladic was also fearful of losing influence to the Bosnian Serb President, Radovan Karadzic, if he were to withdraw his weapons.<sup>35</sup>

Operation Deliberate Force coordinated the use of a variety of air assets. All told more than eighty U.S. aircraft participated in the air assault in addition to other NATO aircraft. According to Department of Defense officials, more than thirty-two hundred sorties were flown and six hundred precision-guided weapons were used in the attack. Of the precision munitions delivered, ninety percent were carried by aircraft and consisted of one-thousand and two-thousand pound laser guided bombs (LGBs) and AGM-65 Maverick missiles. High Speed Anti-Radiation Missiles (HARM) and Stand-off Land Attack Missiles (SLAM) were also launched against Serb air defense sites. The air attack also involved numerous AC-30 gunships and electronic warfare aircraft.<sup>36</sup> The attack-aircraft were preceded by the thirteen Tomahawks targeted against Serbian radar, communication, and command-and-control facilities. According to NATO and U.S. Defense Department officials, the Tomahawks caused some severe damage to their targets, but not all of the cruise missiles hit their exact aim points.<sup>37</sup> The purpose of using Tomahawks in the initial assault minimized the risk of losing pilots in the early phase of

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<sup>35</sup> Ibid., 57.

<sup>36</sup> Chapman, "Air Campaign Was 'Stellar Performance,'" 15.

<sup>37</sup> Craig Covault, "Precision Missiles Bolster NATO Strikes," Aviation Week and Space Technology 143, no. 12, 18 September 1995, 22.

the attack.<sup>38</sup> In the 1991 Gulf War, Tomahawks were fired in the opening minutes of Operation Desert Storm for the same purpose.<sup>39</sup>

Also of importance is the fact that Mladic's headquarters was one of the selected Tomahawk targets. During the 1991 Gulf War, Saddam Hussein's presidential palace was targeted as part of the effort to destroy Iraq's ability at command and control of its war effort. To destroy an adversary's command and control capability by decapitation is no small matter. Decapitation strikes at the epicenter of an adversary's war fighting "center of gravity." At the time of Operation Deliberate Force, Mladic was a significant obstacle to achieving a cease fire and lasting peace in Bosnia. To cut off the head of the Bosnian Serb military would have seriously undermined Bosnian Serb efforts at stalling the peace process. Diplomatic efforts were in full swing, diplomats making every effort to bring the warring factions together and to attain a peaceful solution to the Bosnian civil war. Operation Deliberate Force was NATO's latest effort at coercing the warring factions to accept the diplomatic process and find a peaceful solution to the Bosnian conflict.<sup>40</sup>

Even though Mladic survived the 10 September attack, Operation Deliberate Force was successful in persuading the Serbs to cooperate and heed NATO demands.

Ultimately, the warring factions did agree to negotiate, and so began the arduous peace process that finally became the Dayton Peace Accord.

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<sup>38</sup> Ibid.

<sup>39</sup> During the first press conference on 17 January 1991, according to General Colin Powell, the Chairman of the Joint Chiefs of Staff, "Sea-launched [Tomahawk] cruise missiles were used against targets that required the most accurate targeting and against targets that posed a heavy anti-air threat to strike aircraft. For these, unmanned cruise missiles were the best choice and we are extremely pleased with Tomahawk's performance." Cited in LT Mark D. Phillips, USN, "Tomahawk Strikes!," Surface Warfare 16, no. 2 (March/April, 1991): 9.

<sup>40</sup> "Ratko Refuses to Leave the Sinking Ship," 57.



Tomahawks played a small but significant role in the 10 September air strike in Bosnia. Tomahawks were instrumental in leading the larger and more powerful air assault that followed the thirteen cruise missiles. In a conflict in which NATO could not afford the political liability that a captured pilot would present, Tomahawks were the logical weapon of choice to initiate the attack. Yet, while they did cause severe damage to their targets, there were some apparent misses by the missiles, which raises an important question. Is the political sensitivity of a target, in this case the location of the Tomahawk targets firmly under Serb control, more important than the assured destruction of a target? The Clinton Administration took severe criticism for the degrading dragging of a downed U.S. helicopter pilot's body through the streets of Mogadishu, Somalia in 1993. This horrific image had a lasting impact in the American media and public, and it is safe to bet that the administration did not want to risk a repeat of events. A well known fact in the Bosnian civil war, war atrocities occurred on a regular basis, and a captured American pilot paraded as a prisoner of war would not have served the Administration's interests well.

While Tomahawks were a small, tactical part of Operation Deliberate Force, they served a much larger political objective. The United States and NATO intended to send a clear and unequivocal message to the Bosnian Serb leadership in as clean and politically unencumbered method as possible: stop shelling UN safe areas and seek a negotiated settlement to the civil war in Bosnia. That message was delivered as the surgical air strike on 10 September 1995.

## VI. THE SEPTEMBER 1996 STRIKE : IRAQ

Dubbed Operation Desert Strike, fourteen Tomahawk cruise missiles launched from two surface ships in the Persian Gulf and thirteen air-launched cruise missiles (CALCMs) dropped from two B-52 strategic bombers made their way to numerous air defense sites in southern Iraq at dawn on 3 September 1996. The following day seventeen more Tomahawks were launched against Iraqi air defense sites in southern Iraq from three surface ships and one fast-attack submarine on patrol in the Persian Gulf. The second strike resulted from the need to hit targets not incapacitated in the first volley of cruise missiles.<sup>41</sup> The decision to use cruise missiles over manned attack aircraft for Operation Desert Strike has lasting political and military implications.

Confronted with a defiant Saddam Hussein in a U.S. presidential election year, the purpose of the two-day U.S. cruise missile strikes was two-fold: to punish Saddam Hussein for Iraqi troop transgressions against the Kurdish population in the northern Iraqi city of Irbil, and to destroy Iraqi air defense capabilities as a prelude to expansion of the southern "no-fly zone." In the preceding weeks, Saddam Hussein had amassed a large force of Iraqi troops in the northern Iraqi city of Irbil. Iraqi troops attempted to influence the outcome of feuding between factions of the Kurdish population in the area in and around Irbil, despite U.S. warnings to Iraq not to interfere in the Kurdish feud. These

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<sup>41</sup> David A. Fulghum and Paul Mann, "No Clear Winners Emerge From U.S.-Iraq Clash," Aviation Week and Space Technology 145, no. 11, 9 September 1996, 35.

Iraqi troop incursions into northern Iraq were viewed by the West as an act of further Iraqi defiance of UN and coalition mandates.

Immediately following the 1991 Gulf War, safe-havens, areas off-limits to Iraqi troops, had been set up in northern Iraq to protect the Kurdish population from Iraqi troops. Additionally, the allied coalition, led by the United States, set up "no-fly zones" in northern Iraq to help protect the Kurds from Saddam Hussein's capability to further oppress the Kurdish people living in northern Iraq.

The Clinton Administration used the Iraqi incursions in northern Iraq to justify Operation Desert Strike, calling the strike punishment for Saddam Hussein's behavior. President Clinton insisted that Saddam Hussein "pay a price for the latest act of brutality."<sup>42</sup> Significant, however, is the selection of targets for the strike -- air defense sites in southern Iraq as opposed to the Iraqi troops in northern Iraq that were the advertised problem.

By attacking air defense sites in southern Iraq that had previously threatened allied war planes in the southern "no-fly zone" instead of the Iraqi troops that were the source of the problem in northern Iraq, the Clinton Administration intended to deliver a political message to Saddam Hussein with as little bloodshed as possible. In his own words President Clinton explicitly expressed his message to Saddam Hussein, "Our missiles sent the following message to Saddam Hussein: When you abuse your own people, or threaten your neighbors, you must pay a price."<sup>43</sup>

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<sup>42</sup> Cited in Terence Hunt, "Iraq Must 'Pay a Price,' for Aggression, Clinton Declares," Charleston Gazette, 4 September 1996, 1A.

<sup>43</sup> Cited in Julian Beltrame and Norma Greenaway, "U.S. Strikes Again: 17 More Missiles Launched at Iraq," Calgary Herald, 4 September 1996, A1.

Caught in the apparent disjunction, however, between the selection of air defense targets in southern Iraq as opposed to the Iraqi troops in northern Iraq, the Administration claimed that Operation Desert Strike was intended to deter Saddam Hussein from bolder military moves that might threaten more strategic interests in the south. When questioned at a Pentagon briefing about the selection of targets, Secretary of Defense William Perry commented, "Our concern is that if Saddam Hussein is emboldened by what he would see as a success in the north, he might strike out in areas which are of greater strategic importance to him."<sup>44</sup> Secretary Perry also indicated that the target selection was intended to minimize loss of life and to give greater protection to planes patrolling the expanded southern "no-fly zone."<sup>45</sup>

The Administration's claimed intent was to coerce Iraq into ceasing hostilities aimed at the Kurds in northern Iraq, at allied warplanes over southern Iraq, and to deter Iraq from threatening its neighboring countries to the south. Never the less, it could be argued that calling the strikes retaliation for Iraqi troop actions in northern Iraq was really just an attempt to further justify the cruise missile attacks and to exploit Saddam Hussein's actions in northern Iraq as cover for expanding the southern "no-fly zone." Moving the northern limit of the southern "no-fly zone" northward sixty miles from the 32nd to the 33rd parallel provided better protection for U.S. aircraft overlooking U.S. strategic interests in Kuwait and Saudi Arabia. Targets included SAM sites and air defense

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<sup>44</sup> Cited in Brian Knowlton, "White House Calls for Long Delay in Resumption of Iraqi Oil sales," International Herald Tribune, 4 September 1996.

<sup>45</sup> Ibid.

command and control facilities.<sup>46</sup> Following the strikes, Air Force General Joseph Ralston, Vice Chairman of the Joint Chiefs of Staff, told reporters, "The reason for the strike was to take out those air defenses that would threaten the coalition aircraft [enforcing the expanded southern 'no-fly zone']."<sup>47</sup> Accordingly, Secretary Perry also stated,

Our national interests are not tied to which party prevails in this conflict in northern Iraq. The issue is not simply the Iraqi attack on Irbil. Saddam Hussein has demonstrated once more his willingness to use military power recklessly, and we must demonstrate once more our willingness and capability to check that power and deter him from being the regional bully.<sup>48</sup>

Another Pentagon official stated, "We could have easily hit targets in Baghdad or Irbil with the cruise missiles. Instead, we picked targets that play to our strength."<sup>49</sup> That "strength" was the coalition capability to further control the skies over Iraq with coalition aircraft located at Saudi Arabian air bases and U.S. Navy aircraft aboard aircraft carriers in the Persian Gulf.

Operation Desert Strike had mixed results. After the cruise missile attacks, Iraq moved more than twenty-five aircraft north of the 33rd parallel and shifted approximately 29,000 troops south of the 36th parallel, the southern limit of the northern "no-fly zone." This move shifted elite troops away from the Kurds in northern Iraq, but left some 19,000 troops still in the area. Despite this modest accomplishment, British and French aircraft

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<sup>46</sup> Barbara Starr, "Clinton's Line in the Sand Puts Pressure on DoD," *Jane's Defence Weekly* 26, no. 11, 11 September 1996, 4.

<sup>47</sup> Cited in Patrick J. Sloyan, "Restraint Shown in Missile Attack," *Newsday*, 4 September 1996, A33.

<sup>48</sup> *Ibid.*

<sup>49</sup> *Ibid.*

initially refused to fly in the additional air space created by the expansion of the southern “no-fly zone,” and the French announced altogether that they would no longer participate in the enforcement of the Iraqi “no-fly zones.”<sup>50</sup> This meant that the United States would effectively have to unilaterally enforce the “no-fly zones” over northern and southern Iraq.

Yet, the United States had to conduct the strikes against Iraq’s air defense system unilaterally as well. All of the U.S. Persian Gulf allies declined participation in Operation Desert Strike, necessitating the need to use cruise missiles for the action against Iraq. In addition, although Saudi Arabia supported the expansion of the Southern “no-fly zone,” the Kingdom did not allow U.S. aircraft to use Saudi air bases in the attacks. This prevented AWACS and tanker aircraft from participating in the strikes and forced the two Air Force B-52s to fly thirty-six hour round trip missions from the U.S. air base on Guam.<sup>51</sup> The B-52 flights were reminiscent of the long flights required of Air Force F-111 attack aircraft in the 1986 air strikes against Libya.<sup>52</sup>

Operation Desert Strike is important because it demonstrated the freedom of action with which the United States operates when the NCA determines unilateral military action necessary to achieve U.S. political goals. Politically, the United States had no military option other than using cruise missiles to conduct the September 1996 strikes against Iraq. The cruise missile strikes on the Iraqi air defense system in southern Iraq offered the NCA the unilateral capability to inflict damage on Iraq without attack aircraft, minimizing Iraqi bloodshed and avoiding U.S. casualties altogether.

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<sup>50</sup> Starr, “Clinton’s Line in the Sand Puts Pressure on DoD,” 4.

<sup>51</sup> Sloyan, “Restraint Shown in Missile Attack,” A33.

<sup>52</sup> In that mission the F-111s were required to fly extremely long round trips between their bases in England and their Libyan targets due to territorial overflight restrictions.



## VII. CONCLUSIONS

The Tomahawk cruise missile has become the "weapon of choice" for the U.S. NCA in the years subsequent to the Persian Gulf War. The January and June 1993 strikes in Iraq, the September 1995 strikes in Bosnia, and the September 1996 strikes in Iraq provide telling examples of why the United States has come to rely almost exclusively on the Tomahawk cruise missile as *the primary military instrument* to achieve U.S. political goals when force is deemed necessary by the NCA. Yet, more importantly, these cases also provide clues as to the likely political and military repercussions of the future employment of Tomahawk cruise missiles.

An often utilized asset of the NCA and theater commanders in recent years, Tomahawk cruise missiles have demonstrated political utility when employed as instruments in the execution of U.S. foreign policy. That utility has primarily taken two forms subsequent to the 1991 Gulf War: as a means of avoiding casualties to U.S. military personnel and U.S. adversaries, and as a means of destroying military targets.

### **The Political Price of Casualties**

Avoiding civilian casualties has been a matter of U.S. policy.<sup>53</sup> Avoiding any unnecessary loss of life has always been a maxim of the United States when exercising the military option. In recent years, however, that maxim has been warped into a false

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<sup>53</sup> Secretary of Defense Richard Cheney (1989-93), Telephone Interview with Lieutenant Timothy F. Sparks, USN, 30 April 1997.



misperception -- that the United States must avoid virtually all risk of casualties, whether in the form of downed pilots or bloodshed, when employing military force in a conflict.

In an age where television pictures can instantly display the graphic images of armed conflict into homes throughout the United States and around the world, horrific scenes of military casualties can have a profound negative effect on the viewing public, both domestic and international. Such pictures have the ability to influence public perception regarding the value of U.S. intervention overseas and can thus influence events in the present tense. This is not meant to imply that graphic scenes of death and destruction are a new phenomenon, only that the speed with which they can now be viewed in relation to how recently an event occurred now has the ability to influence events as they occur.<sup>54</sup> According to former National Security Advisor and Chairman of the JCS General Colin Powell, "Television and instant second-guessing makes it more imperative that the cost of casualties is worth the cause."<sup>55</sup> Precision-guided weapons like the Tomahawk cruise missile play to this influence to the NCA's advantage.

The four instances of Tomahawk cruise missile employment since the 1991 Gulf War demonstrate the overriding influence that this phenomenon has had on NCA decision making when using military force to achieve political objectives. In all four strikes, minimizing the risk of casualties was a primary concern of the NCA.

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<sup>54</sup> Graphic images of the "highway of death" during the 1991 Gulf War and the dragging of a downed U.S. helicopter pilot's body through the streets of Mogadishu, Somalia in 1993 had the profound effect of hastening the conclusion of those military actions.

<sup>55</sup> Letter dated 28 May 1997 from General Colin Powell, USA (Ret) to Lieutenant Timothy F. Sparks, USN. See APPENDIX C.

In the January 1993, Zaafaraniyah strike, forty-two Tomahawks struck in the early evening hours in an attack intended to deliver a political message to Saddam Hussein. Located in a Baghdad suburb, the Zaafaraniyah facility was not under the cover of coalition "no-fly zones." Using Tomahawks meant that no U.S. pilot could be killed or captured in the strike, and subsequently used as leverage against the United States.<sup>56</sup> Additionally, the time of the attack helped to minimize the number of possible Iraqi casualties.

In the June 1993 Iraqi intelligence headquarters strike, twenty-three Tomahawks struck at just past midnight in another attack intended to punish the Iraqis and deliver a political message to the Iraqi leadership. Also located in Baghdad, out from under the cover of coalition "no-fly zones" and out of the reach of possible search and rescue efforts, using Tomahawks meant, once again, that no U.S. pilot could be killed or captured in the strike. And like the Zaafaraniyah strike, the time of the attack minimized the number of possible Iraqi casualties.

In the September 1995 attack on Bosnian Serb air defense sites, the utility of Tomahawks was somewhat different than the Zaafaraniyah and Iraqi intelligence headquarters strikes. As previously discussed, Tomahawks were utilized tactically as part of a much larger air operation, minimizing the SAM risk to NATO pilots, much as they had done during the 1991 Gulf War.

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<sup>56</sup> In the 1983 conflict in Lebanon a captured U.S. pilot was used as leverage against the United States. Secretary of Defense Richard Cheney (1989-93), Telephone Interview, 30 April 1997.

In the September 1996 strikes on Iraqi air defense sites, cruise missiles were again chosen for their political utility to avoid U.S. casualties. Despite having no other military option than a cruise missile strike, the result of no Persian Gulf ally being willing to participate in Operation Desert Strike, cruise missiles fulfilled NCA political objectives regardless. Cruise missiles enabled the NCA the capability to avoid the political risk of a dead or captured U.S. pilot, and they also served the greater U.S. strategic interest of reducing the SAM threat to coalition aircraft enforcing the "no-fly zones" over Iraq.

### **Strategic vs. Tactical**

Since the conclusion of the 1991 Gulf War, the use of Tomahawk cruise missiles has fluctuated between employment as strategic and tactical weapons. In the 1993 strikes on the Zaafaraniyah nuclear weapon components manufacturing facility and on the Iraqi Intelligence headquarters, the employment of Tomahawks was strategic in nature. In the 1995 attack on the Bosnian Serb air defense system, Tomahawks were employed tactically. In the 1996 strikes on the Iraqi air defense system, the employment of Tomahawks was both tactical and strategic in nature.

With recent developments to the Tomahawk weapon system improving and expanding all aspects of the cruise missile's performance, the evolution of Tomahawk indicates that the Tomahawk will become more tactical in the coming years. The most significant development to push Tomahawk in this direction is the shortening of mission planning time, the time it takes to transfer a requirement by the NCA or a theater

commander into a Tomahawk mission and load the mission into the missile.<sup>57</sup> What used to take days, now takes a matter of a few hours, and will ultimately take a few minutes. As new technology has been incorporated into the Tomahawk weapon system, Tomahawks have continued to become more of an invaluable asset to the NCA and theater commanders. Every indication points to a future that will continue to see Tomahawk cruise missile technology and employment proceed in this direction.

### **Deterrence and the Changing Face of Gunboat Diplomacy**

Another foothold in the conducting of U.S. foreign policy for the future has been secured by the recurring employment of Tomahawk cruise missiles in the 1990s. That foothold has firmly been established by the platforms that launch cruise missiles, specifically navy ships and submarines. Although thirteen air-launched cruise missiles (CALCMs) were used in the September 1996 strikes on Iraq, their contribution to the continuing evolution of strategic and tactical air power has been minor. Strategic bombers do not loiter nor do they cover on a continual basis most points on the globe as do navy Tomahawk cruise missile platforms. The traditional argument about which service, navy or air force, best provides the United States with global presence and conducts diplomacy on a regular basis is manifested in the four cruise missile strikes since 1991, and even more so in the September 1996 cruise missile restrike. Forced to restrike less than twenty-four hours after the initial cruise missile attack, navy Tomahawks were the weapons of choice.

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<sup>57</sup> Phillips, "Tomahawk Strikes!" 12.

## Implications

Much of the preceding evidence does point to the fact that Tomahawk cruise missiles have supplanted more traditional methods of military force as the primary means of delivering a military punch to achieve political gain -- a result of their seemingly politically risk-free nature. Critics argue that the utility of seemingly risk-free weapons like Tomahawk is really a "fallacy." According to Edward Luttwak of the Center for Strategic Studies, "the irresistible attraction of using force with no political or casualty risk has perverted this weapon. It's being presented as comparable to bombardment, when it's not."<sup>58</sup> The truly important point, however, is not how the weapon system is being presented, but rather, how it is being employed and whether or not that is a good or bad thing.

Critics argue that this "perversion" of Tomahawk, using Tomahawk in situations where it might be better to use manned attack-aircraft, will mislead the American public into believing and expecting that future uses of limited military power need not result in U.S. casualties. In an interview I conducted with former Secretary of Defense Dick Cheney, Secretary Cheney reasoned:

What do you want to do, get people killed? That's a crazy argument. You use the force you need to achieve your objective, and obviously you want to minimize U.S. casualties. And if I can do that without getting any of our people killed, I'm damn happy about it, so I don't have any tolerance for somebody who would argue to the contrary. We'd be damned fools if we didn't take advantage of our capabilities and use our technology to the maximum extent possible. Why would you want to get somebody killed if you don't have to? That's a nice esoteric argument for people who don't have to make those decisions. If we can prevail in a conflict by imposing

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<sup>58</sup> Cited in Richard J. Newman, "Cruise Missiles-The Fallacy of 'No Risk' Strikes," U.S. News and World Report 121, no. 12 (23 September 1996): 59.

maximum damage on the enemy at a minimal cost to ourselves, I can't think of a better way to pursue.<sup>59</sup>

The point is not whether or not manned attack-aircraft could have gotten the job done at less "cost" or more efficiently than cruise missiles in the four cases previously discussed.<sup>60</sup> The point is that cruise missiles *did* fulfill roles that previously would have been reserved for more traditional methods of military force prior to the 1991 Gulf War. General Powell answered the same critical arguments about recent Tomahawk employment and responded:

There are critics of everything. Many purport to speak for the 'American People' without ever leaving their critic's desk. The American people can sustain casualties if they believe in the cause. We proved that repeatedly over the course of our history. We didn't understand that in Vietnam. At the beginning of Desert Storm, the American people were ready for a war that 'critics' and 'experts' said would produce thousands of casualties...Critics and analysts love to create patterns and precedents that don't hold up. You use the best weapons to achieve the military and political objectives that are established. In the September 1996 case, a restrike was directed. Do you believe the implied assumption that with attack aircraft, restrikes are not needed? I've ordered many of them.<sup>61</sup>

If cruise missiles and similar unmanned "smart weapons" can be employed so as to achieve the same political objectives as attack aircraft, then they should be used, regardless of whether or not it takes multiple missile salvos. No guarantee exists that manned attack aircraft will accomplish a specific mission with any more political success or military effectiveness than will be accomplished by the employment of cruise missiles.

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<sup>59</sup> Secretary of Defense Richard Cheney (1989-93), Telephone Interview, 30 April 1997.

<sup>60</sup> The dollar cost of Tomahawks has steadily diminished over the years, due in part to the large number procured and reconfigured. The cost of a single missile has diminished from close to 3 million dollars a copy at the beginning of the 1980's to less than one million dollars a copy today.

<sup>61</sup> General Powell, letter dated 28 May 1997.

This is not to suggest that cruise missiles and other “smart weapons” can and will replace all other military instruments in the accomplishment of political objectives. Just as strategic air power has not replaced the need for combat troops and naval forces as once was envisioned, cruise missiles will not completely replace all other military means of accomplishing political objectives. This point is demonstrated by the September 1995 Bosnian strike, where Tomahawks participated in a supporting role, and by the presence of U.S. ground forces in Bosnia helping to enforce the Dayton Peace Accord.

### **Policy Recommendations**

The Department of the Navy and Department of Defense should aggressively pursue the continued procurement and future development of the Tomahawk weapon system and its evolutionary deep-strike descendants. Budget cuts, however, seriously hamper the ability of DOD to fund this weapon system at levels that can sustain the number of vertical launch cells currently available and expected in the future.<sup>62</sup>

Additionally, policy makers should continue to consider the strategic value that Tomahawk capable platforms have on the capability to impact regional events and provide political leverage on a continual basis. However, policy makers also need to maintain the patience necessary for diplomatic efforts to run their course before resorting to using military leverage to attain political goals. The ability to use military force with seemingly risk-free weapons runs the danger of becoming an easy solution for resolving conflicts. Diligence and leadership must continue to be exercised to keep the American public

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<sup>62</sup> As the Navy pursues new VLS platforms, like the Arsenal ship and SC-21 concepts, to fulfill its deep-strike mission.

apprised of the true costs and risks involved in using any military force. The ability to strike at adversaries with ostensibly risk-free weapons like Tomahawk does not relieve U.S. leadership of its awesome responsibility to the American public to explain the reasons behind and justification for using military force to achieve political objectives. Precisely because of the speed of modern day telecommunications and "instant second-guessing," the NCA must be ever the more tenacious in its pursuit of worthy political objectives and its assurance to the American public of its justification for using military force to attain those political objectives.

Despite their recent uses as strategic weapons, Tomahawk cruise missiles are tactical weapons and should maintain their tactical weapon status, at the disposal of theater commanders for use in tactical, as well as strategic, situations. Tomahawk employment by the NCA in the 1990s has had strategic implications for the future of U.S. regional deterrence. As tools of persuasion, Tomahawk-capable surface combatants and submarines have been elevated to a status-level previously reserved only for the venerable aircraft carrier. Since the end of the 1991 Gulf War, Tomahawk-capable platforms have demonstrated that Tomahawk cruise missiles are the NCA "weapon of choice" and the primary means of delivering a military punch to achieve political gain. In time of crisis, no longer is the question, "where is the nearest carrier," but instead "where are the Tomahawks?"





## APPENDIX A

### THE BRITISH TOMAHAWK SALE

In October 1995 the United States agreed to sell conventional Tomahawk land-attack cruise missiles to the United Kingdom. These deep-strike, precision weapons will be backfitted onto British Royal Navy nuclear fast-attack submarines over the next several years. The British will also receive the software and hardware necessary for complete targeting and mission planning for the cruise missiles.<sup>63</sup>

As a continued effort of modernization and as a consequence of the 1991 Gulf War, the British Ministry of Defense conducted a study and "identified the need for a long-range precision strike weapon designed to hit strategic targets with the minimum of collateral damage,"<sup>64</sup> and concluded that the conventionally armed Tomahawk land attack cruise missile (TLAM) was the answer to the void in British deep-strike capabilities.

The British Royal Navy that exists today is an extremely capable force, but now finds itself in a time of limited resources desperately searching for a new mission to justify its continued existence. According to Geoffrey Till, a noted author on naval strategy, "British sea power is only valuable if it is relevant and capable of producing appropriate force at the right time and place."<sup>65</sup> So, the question then becomes, what is relevant and constitutes appropriate force in today's uncertain world political climate? The British desire to obtain Tomahawk cruise missiles from the United States is the logical answer to this question. U.S. Tomahawk strikes over the last five years, the fact that the British suffered heavy losses in their Tornado squadrons during the Gulf War, and fiscal

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<sup>63</sup> Richard Scott, "UK Tomahawk's Tight Schedule on Target," Jane's Defence Weekly (6 March 1996): 45-6.

<sup>64</sup> *Ibid.*

<sup>65</sup> Geoffrey Till, The Future of British Sea Power, (Annapolis: Naval Institute Press, 1984), 126.

constraints further amplify the British need to field a long-range precision strike weapon at relatively low cost.

Subsequent to the Ministry of Defense strategic study, the United Kingdom agreed in October 1995 to purchase 65 conventionally armed Tomahawk land attack cruise missiles from the United States for slightly more than 140 million dollars. In addition to the cruise missiles themselves, the sale includes all of the related hardware, software, parts, and technical support needed to fully implement the Tomahawk weapon system into the Royal Navy.

The Tomahawk sale includes the following:

- 65 Submarine Tube Launched Block III C Tomahawk Cruise Missiles
- 4 Trial Test Firings (2 Telemetry Tomahawks and 2 Live War Shots)
- Mission Planning Center Equipment and Software
- Tomahawk Weapon Control Equipment and Software
- Support and Test Equipment
- Parts Supply Support
- Technical Assistance

Total Estimated Cost: \$ 140,142,991.

The missile delivery schedule will commence with the first two missiles to be delivered in the third quarter of calendar year 1997 and will conclude with the last two missiles to be delivered in the third quarter of calendar year 2000.<sup>66</sup> The first British Trafalgar class nuclear fast-attack submarine armed with Tomahawks is scheduled to be operational in late 1998.<sup>67</sup>

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<sup>66</sup> Navy International Programs Office, "Letter of Offer and Acceptance," Serial No. 04A13/5U4A3169, (Washington, D.C., 16 October 1995), 2, 5.

<sup>67</sup> Scott, "UK Tomahawk's Tight Schedule on Target," 45.

The version of Tomahawk that the British are receiving is the latest model of Tomahawk currently available to the U.S. Navy, the Block III. The significance of Block III Tomahawks is that they are vastly superior weapons compared to the Block II's, which are still found in significant numbers throughout the U.S. fleet but are slowly being replaced with Block III missiles.



## APPENDIX B

### SECRETARY CHENEY INTERVIEW

The following questions and answers were taken from a telephone interview I conducted with former Secretary of Defense Dick Cheney on 30 April 1997.

1. There are critics who feel that the American public is being led into a false sense of security by the use of weapons like cruise missiles because they pose very little risk to U.S. personnel. What are your thoughts on this?

Secretary Cheney: *"What do you want to do, get people killed? That's a crazy argument. You use the force you need to achieve your objective, and obviously you want to minimize U.S. casualties. And if I can do that without getting any of our people killed, I'm damn happy about it, so I don't have any tolerance for somebody who would argue to the contrary."*

2. There are also some critics that believe that the American public might come to expect and accept nothing less in the future than zero casualties. Do you think that is a valid statement?

Secretary Cheney: *"That's really an issue of leadership...I think that no one should assume that that is necessarily going to be the kind of war we're going to fight in the future. Clearly, the American people are always going to lean in the direction of as few casualties as possible. We've got ample history of this country, going back over 200 years, of taking very, very significant casualties as was required by our national interests. I think that's a mistake. You get into trouble if you're military leadership conveys the notion...The military understands this better than anyone else, but they need to remind everybody else periodically, at least in terms of casualties."*

3. Do you feel there is any downside to using precision-guided weapons like cruise missiles? If the use of standoff weapons like cruise missiles continues to be the norm in future military operations, do you feel there are any possible long-term repercussions for the United States politically or militarily?

Secretary Cheney: *"We'd be damned fools if we didn't take advantage of our capabilities and use our technology to the maximum extent possible. Why would you want to get somebody killed if you don't have to? That's a nice esoteric argument for people who don't have to make those decisions. If we can prevail in a conflict by imposing maximum damage on the enemy at a minimal cost to ourselves, I can't think of a better way to pursue."*

4. Do you feel, as there are some that argue, that it will drive other, less industrialized, nations to pursue other means of retaliation and defense?

Secretary Cheney: *"Well, it's always possible. You get the arguments that they'll resort to terrorism or get into weapons of mass destruction of some kind. I think that's always a possibility. I don't know that our reliance on precision-guided munitions is going to force them in that direction any faster... Clearly, in terms of our capabilities in the Gulf, it caused a lot of reassessment, if you will, in defense ministries all over the world. There isn't anybody out there today who can hold a candle to us in terms of our conventional capabilities. What we've been able to do, obviously, is to take what used to be a strategic weapon for us, nuclear weapons, and push them aside with great consequence. We can't get rid of nuclear weapons, but we are now able, in effect, to put conventional warheads on precision-guided munitions and launch a strategic strike and shut down a country, something we could only contemplate previously."*

## APPENDIX C

### GENERAL POWELL RESPONSE

The following are questions I sent to General Colin Powell, former National Security Advisor and Chairman of the Joint Chiefs of Staff, and the response he sent to me in a letter dated 28 May 1997.

1. How did the following factors, risk to U.S. air crews, collateral damage, and possible civilian casualties, affect NCA decisions to use Tomahawk cruise missiles in place of attack-aircraft armed with precision-guided munitions in the January 1993 Zaafaraniyah strike and the June 1993 strike against the Iraqi Intelligence headquarters?

2. There are critics who feel that the American public is being led into a false sense of security by the increasing use of what critics call "no-risk" strikes by the use of weapons like cruise missiles and that the American public will come to expect and accept nothing less than zero casualties in future military responses to regional conflicts. What are your thoughts on this?

3. There are also critics who feel that cruise missiles are being used primarily because they pose little risk to U.S. forces when attack aircraft would do a better job of destroying a target -- the example being the September 1996 strikes on Iraqi air defense sites when a restrike had to be ordered because the initial missile salvo did not complete the job. What are your thoughts on this argument?



**GENERAL COLIN L. POWELL**  
909 NORTH WASHINGTON STREET, SUITE 764  
ALEXANDRIA, VIRGINIA 22314

May 28, 1997

Lt. Timothy F. Sparks, USN  
499 Spencer Street  
Monterey, CA 93940

Dear Lt. Sparks:

I am afraid I am drowning in a sea of hundreds of requests for interviews, book comments, articles and research studies and I will not be able to talk to you.

With respect to your three questions:

1. All the factors you list were taken into account. We wanted to punish the Iraqis and not get involved in a protracted exchange. Cruise missiles would not result in POWs or casualties. They did not require penetration of an air defense system, however weak, and they don't have accidents which cause friendly losses. It seemed to me then and it seems to me now that we used the cruise missiles for the purposes we developed and bought them.

2. There are critics of everything. Many purport to speak for the "American people" without ever leaving their critic's desk. The American people can sustain casualties if they believe in the cause. We proved that repeatedly over the course of our history. We didn't understand that in Vietnam. At the beginning of Desert Storm, the American people were ready for a war that "critics" and "experts" said would produce thousands of casualties. Television and instant second-guessing makes it more imperative that the cost of casualties is worth the cause.

3. Each situation is different. Critics and analysts love to create patterns and precedents that don't hold up. You use the best weapons to achieve the military and political objectives that are established. In the September, 1996 case, a restrike was directed. Do you believe the implied assumption that with attack aircraft, restrikes are not needed? I've ordered many of them.

I think you run the risk of trying to create a thesis on a narrow base. Cruise missiles are a weapon, not a foreign policy or even a determinant of foreign policy.

Best of luck,

Sincerely,



## BIBLIOGRAPHY

- 1997 National Security Strategy (Washington, D.C.: The White House, 1997).
- "A Missile Too Many?" The Economist, U.K. Edition (23 January, 1993).
- "Australia Reviews Tomahawk," Jane's Defence Weekly, vol. 26, no. 11 (11 September 1996).
- Anderson, Edmund R., Jeffrey J. Barratt, and Craig R. Welterlen, "TSTAR: Tomahawk Stops The Attacking Regiments," Surface Warfare, vol. 21, no. 2, (March/April, 1996).
- Bailey, Kathleen C., "Responding to the Threat of Biological Weapons," Security Dialogue vol. 26, no. 4 (1995).
- Baxter, Lieutenant Commander Kevin, USN, "Tomahawk: Better Than Ever," Surface Warfare, vol. 19, no. 3 (May/June, 1994).
- Baxter, Lieutenant Commander Kevin, USN, "Tomahawk: What We Don't See," Surface Warfare, vol. 19, no. 4 (May/June, 1994).
- Beltrame, Julian, and Norma Greenaway, "U.S. Strikes Again: 17 More Missiles Launched at Iraq," Calgary Herald (Southam Inc., 4 September 1996).
- Boatman, John, and Paul Beaver, "Coalition Draws New Line in the Sand," Jane's Defence Weekly, vol. 19, no. 4 (Jane's Information Group Limited, 23 January 1993).
- Cable, James, Gunboat Diplomacy, 1919-1991 - Political Applications of Limited Naval Force (New York: St. Martin's Press, 1994).
- Chapman, Suzanne, "Air Campaign Was 'Stellar Performance,'" Air Force Magazine (Air Force Association, November 1995).
- Cheney, Richard, Secretary of Defense 1989-93, Telephone Interview with Lieutenant Timothy F. Sparks, USN, 30 April 1997 [APPENDIX B].
- Collins, James, "Striking Back," Time (The Time Inc. Magazine Company, 5 July, 1993).
- Command and Control Program Cruise Missiles Project (CMP), "Stand Up Plan" (Washington, D.C.: 3 May 1995).
- Command and Control Program Cruise Missiles Project (CMP), "Statement of Work" (Washington, D.C.: 15 March 1996).

Covault, Craig, "Precision Missiles Bolster NATO Strikes," Aviation Week and Space Technology, vol. 143, no. 12 (McGraw Hill, 18 September, 1995).

Cruise Missiles Command and Control Program (PMA-281) of the Program Executive Office, Cruise Missiles Project (CMP) and Unmanned Aerial Vehicles Joint Project (PEO(CU)), "Integrated Logistics Support Plan (ILSP)" (Washington, D.C.: 3 May 1995).

Department of the Navy, Forward from the Sea (Washington, D.C.: Department of the Navy, 1994).

Edge, Simon, "Saddam Survives Parting Shot; George Bush's Campaign Against Saddam Hussein During His Last Days of Office," MEED Middle East Business Weekly, vol. 37, no. 4, (United Kingdom: EMAP Business Information Ltd., 1993).

Fulghum, David A., "Clashes with Iraq Continue After Week of Heavy Air Strikes," Aviation Week and Space Technology, vol. 138, no. 4 (McGraw Hill Inc., 25 January, 1993).

Fulghum, David A., "Low Tomahawk Kill Rate Under Study," Aviation Week and Space Technology, vol. 139, no. 4 (McGraw Hill Inc., 5 July, 1993).

Fulghum, David A., and Paul Mann, "No Clear Winners Emerge From U.S.-Iraq Clash," Aviation Week and Space Technology, vol. 145, no. 11 (McGraw Hill Inc., 9 September 1996).

Fulghum, David A., "Satellite Radars To Guide Missiles," Aviation Week and Space Technology, vol. 145, no. 14 (McGraw Hill Inc., 30 September, 1996).

Hunt, Terence, "Iraq Must 'Pay a Price,' for Aggression, Clinton Declares," Charleston Gazette, 4 September 1996.

Harknett, Richard J., "Integrating Tomahawk into a Conventional Deterrence Strategy: Inherent Flaws, Blunt Solutions" (paper presented at the Conference on Conventional Deterrence in the Post-Cold War Era, Naval Postgraduate School, Monterey, California, 13-14 August 1992).

Institute for National Strategic Studies, Strategic Assessment 1996: Instruments of U.S. Power (Washington, D.C.: National Defense University, 1996)

International Institute for Strategic Studies (IISS), Strategic Survey, 1995-1996 (London: Oxford University Press, 1996).

Jones, Eric R., Master's Thesis entitled "The Proliferation of Conventionally-Powered Submarines: Balancing U.S. Cruise Missile Diplomacy? The Cases of India and Iran" (Monterey, California: Naval Postgraduate School, June 1997).

Knowlton, Brian, "White House Calls for Long Delay in Resumption of Iraqi Oil sales," International Herald Tribune, 4 September 1996.

Lavitt, Michael O., "Harder Hitting Tomahawk Warhead," Aviation Week and Space Technology, vol. 138, no. 12 (McGraw Hill Inc., 22 March 1993).

Lehman, John, Making War (New York: Charles Scribner's Sons, 1992).

Luttwak, Edward N., Strategy: The Logic of War and Peace (Cambridge: Harvard University Press, 1987).

Malloy, Todd Webster, Master's Thesis entitled "Why the United States Should Negotiate a Ban on Naval Tactical Nuclear Weapons" (Monterey, California: Naval Postgraduate School, 1991).

Mandelbaum, Michael, The Nuclear Future (Ithaca: Cornell University Press, 1983).

Marshall, Robert, "Don't Tread on Us," Maclean's (Maclean Hunter Limited, 5 July, 1993).

National Defense University, "Instruments of U.S. Power," Strategic Assessment, 1996 (Washington, D.C.: National Defense University Press, 1996).

Navy International Programs Office, "Letter of Offer and Acceptance," Serial No. 04A13/5U4A3169 (Washington, D.C.: 16 October 1995).

Newman, Richard J., "Cruise Missiles-The Fallacy of 'No Risk' Strikes," U.S. News and World Report, vol. 121, no. 12 (23 September 1996).

Phillips, Lieutenant Mark D., USN, "Tomahawk Strikes!," Surface Warfare, vol. 16, no. 2 (March/April, 1991).

Powell, General Colin, USA (Ret), Letter to Lieutenant Timothy F. Sparks, USN, dated 28 May 1997 [APPENDIX C].

"Ratko Refuses to Leave the Sinking Ship," The Economist (The Economist Newspaper Ltd., 16 September, 1995).

Robinson, John, "Tomahawk Breaks Submarine Silence," Defense Daily vol. 192, no. 47 (5 September 1996).

Sabalos, Nicholas Jr., "Weapon of Choice: Surface Warfare Strikes!," Surface Warfare, vol. 18, no. 5 (September/October 1993).

Schelling, Thomas C., Arms and Influence (New Haven: Yale University Press, 1966).

Schissler, Joseph C., "ATWCS: A Step Into The Future," Surface Warfare, vol. 21, no. 5 (September/October, 1996).

Scott, Richard, "UK Tomahawk's Tight Schedule on Target," Jane's Defence Weekly (6 March 1996).

Sloyan, Patrick J., "Restraint Shown in Missile Attack," Newsday, 4 September 1996.

Starr, Barbara, "Clinton's Line in the Sand Puts Pressure on DoD," Jane's Defence Weekly, vol. 26, no. 11 (Jane's Information Group Limited, 11 September 1996).

Tangredi, Sam J., "Are We Firing Tomahawks Too Easily?" Proceedings vol. 122, no. 12 (December 1996).

"Third Kilo Delivered to Iran's Gulf Naval Base," Jane's Defense Weekly, vol. 27, no. 4 (January 27, 1997).

Till, Geoffrey, The Future of British Sea Power (Annapolis: Naval Institute Press, 1984).

Townes, John W., III, "Surface Strike: The Powerful Punch of Deterrence," Surface Warfare vol. 22, no. 1 (January/February 1997).

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