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CASE STUDY
National War College
National Defense University

Fifty Shades of Friction

Combat Climate, B-52 Crews, and the Vietnam War

by Mark Clodfelter



National War College

National Defense University

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Cover

U.S. Air Force Boeing B-52F Stratofortress from 320th Bomb Wing dropping bombs over Vietnam in mid-1960s (U.S. Air Force)

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Combat Climate, B-52 Crews, and the Vietnam War

by Mark Clodfelter

*National War College
Case Study*



**NDU
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September 2016

Dedicated to

WILLIAM F. "B.A." ANDREWS
Colonel, USAF (Ret.)

Fighter Pilot, Hero, Scholar

In war more than anywhere else things do not turn out as we expect.

—Carl von Clausewitz

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Foreword

Dr. Mark “Clod” Clodfelter is an internationally recognized scholar and valued faculty member at the National Defense University. His case study analysis of how B-52 crewmembers in Vietnam dealt with friction—uncertainty, chance, danger, and stress—relies in large measure on responses received from those members via a survey that he created, and thus his account makes a substantial contribution to the historical record of the air wars over Vietnam. Equally significant, his work reveals that political and military leaders alike directly affect the amount of friction faced by those on “the pointy tip of the spear,” and thus those leaders must tailor their decisionmaking accordingly.

Professional military educational institutions, from Service academies through senior Service colleges, should find this case study of merit, as should any academic institution that explores the design and implementation of national security strategy.

A handwritten signature in black ink, appearing to read "Fm Padilla". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

MajGen F.M. PADILLA, USMC
President
National Defense University

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The author is most grateful to Colonel William F. “B.A.” Andrews, USAF (Ret.), Ph.D., for the inspiration that led to this project; this monograph is dedicated to him. The author thanks the 85 B-52 crewmembers who participated in the survey and also thanks all those who provided comments via email, letter, and telephone. The author extends a special thanks to Major John R. Allen, USAF (Ret.), who provided the initial spark of interest in B-52 operations during the Vietnam War and who has remained a lifelong friend; and Captain Kenneth B. Sampson, USAF (Ret.), who sent extensive materials detailing his Vietnam service, to include the essential *We Were Crewdogs* volumes edited by Tommy Towery.

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“Four elements make up the climate of war: danger, exertion, uncertainty, and chance,” wrote Prussian military philosopher Carl von Clausewitz in his seminal *On War*.¹ He observed that collectively, those four elements comprised the notion of *friction*, which he defined as “the only concept that more or less corresponds to the factors that distinguish real war from war on paper.”² Friction has disrupted the implementation of war plans since the dawn of civilization, and despite efforts to minimize its effects, it will continue to do so.

From the Airman’s perspective, friction looms especially large because of the importance of the technology needed not only to fight in the third dimension above the surface of the Earth, but also to live there, or at least to secure a presence in that environment. The possible breakdown of equipment or structural failure of an airframe could heighten stress and danger regardless of whether an enemy attempts to shoot down an aircraft. Additionally, unanticipated weather conditions could have a tremendous impact on aerial operations and their prospects for achieving success, or even occurring at all. Clausewitz remarked, “Countless minor incidents—the kind you can never really foresee—continue to lower the general level of performance, so that one always falls far short of the intended goal.”³

Friction’s impact on achieving the intended goal with airpower has served as a theme in Air Force doctrinal manuals, in particular after the December 1984 publication of Barry Watts’s *The Foundation of U.S. Air Doctrine: The Problem of Friction in War*.⁴ In that important work, Watts examined how instructors at the Air Corps Tactical School during the interwar years developed what they believed to be a war-winning concept of high-altitude, daylight, precision bombing, only to find that friction disrupted their formulaic plans to implement that notion during World War II. He noted, “While the conduct of war clearly involves engineering, it cannot be reduced to engineering.”⁵ Watts maintained that Air Force doctrine in the post–World War II era had continued to stress the merits of a mechanistic approach to applying airpower while ignoring the likelihood of friction. The March 1992 edition of the Air Force’s Basic Doctrine Manual, the first published after Watts’s study, took his emphasis on friction to heart and highlighted the notion throughout its two volumes. Yet the manuals that followed have progressively downplayed the importance of the concept. The current edition of the Air Force’s Basic Doctrine Manual, dated February 27, 2015, acknowledges that friction “can impede” activity in war and can make “even simple operations unexpectedly and sometimes even insurmountably difficult,” but those are the only two occasions where the manual addresses friction and its ramifications.⁶

If the Air Force is to succeed in achieving its mission of “flying, fighting, and winning in air, space, and cyberspace,” it must devote attention to examining how friction affects the individuals charged with actually accomplishing that mission. This guidance seems straightforward,

though Clausewitz would quickly add that “everything in war is simple, but the simplest thing is difficult.”⁷ When war plans go awry, often the apparent reason for failure is the inability of untrained personnel on “the pointy end of the spear” to deal with instances of chance, uncertainty, danger, or stress. Likewise, when war plans succeed in achieving the desired political outcome, those in harm’s way have often overcome episodes of friction that they faced. Such observations are incomplete, however, because the *amount* of friction occurring on some missions stems not only from the happenstance conditions encountered by Airmen on the spear’s pointy edge but also from decisions made by political and military leaders before the missions ever depart the runway. Friction is endemic to any military operation; it can never be completely eliminated. Yet political and military leaders alike can limit its *prospects* by realizing that their orders will likely correlate to the magnitude of friction faced by those who must fly and fight. Accordingly, a renewed emphasis on the importance of friction is essential for future Air Force doctrinal manuals, as well as for the professional military education of future Air Force leaders.

The following case study is an effort to reveal how a specific group of Airmen—the crews flying the B-52 “Stratofortress”—dealt with friction during the course of a single conflict, the Vietnam War. For multiple reasons, the experiences of B-52 crewmembers in Vietnam provide an intriguing case for examining the impact of friction on Airmen. First, the amount of friction encountered in the “in-country air war” that occurred over South Vietnam usually differed from the friction comprising the “out-country air war” transpiring over Cambodia, Laos, and especially North Vietnam. Second, aeronautical engineers designed the B-52 to deliver nuclear bombs, and converting the aircraft into a platform that could deliver conventional ordnance also created additional frictional elements for the crews in Southeast Asia. Third, the B-52 was in fact an aircraft requiring a “crew” to fly. Together, six men made the bomber operational, and the need for “crew integrity” among those six increased friction’s probability.

Equally important “frictional factors” originated from high-level command decisions. The verdict to employ the B-52 in Vietnam not only spurred significant modifications to the airframe but also heightened friction for aircrews trained for nuclear operations in Strategic Air Command (SAC). SAC’s choice of how to send those crews to war further increased friction’s likelihood. Once President Richard Nixon ordered B-52s against targets in the North Vietnamese heartland during Operation *Linebacker II*, the 11-day air campaign in December 1972, the decisionmaking of Air Force commanders profoundly affected the volume of friction encountered by the crews flying those raids. Yet throughout the Vietnam experience, the factor that perhaps most affected the prospect of crewmember friction was the failure of U.S. political and military leadership to articulate exactly *what* the crews needed to do to achieve success. The

absence of a clear definition of *victory* intensified the stress that many crewmembers suffered because they could see no end to the missions that they flew or the war that they fought in. With no way for crews to gauge progress in a seemingly ceaseless conflict, the demons of uncertainty, chance, danger, and stress appeared only to grow in magnitude. Crewmembers thus devised their own measures to determine success, but the ostensible lack of an overall purpose for the war hampered their ability to limit friction's impact.

The case study that follows draws heavily on survey responses received from 85 B-52 crewmembers who flew in the Vietnam War. Those veterans responded to a series of questions addressing such topics as the adequacy of the training that they received, their perception of the threats that they encountered, and their views on the competency of the leadership, both military and political, that directed them. All of the questions related to dealing with friction, and survey participants could choose from among many listed responses that produced computer-tabulated percentages; they could also elaborate on their choices in written commentaries. Many took advantage of that last option, and some used extensive follow-up emails as well as telephone interviews or letters to make their points. Those additional inputs have endnotes associated with them, while the comments provided as part of the original survey do not. All of the contributions received, though, were essential components of this case study.

Besides the survey, other sources provided key information for this work. The firsthand accounts from B-52 crewmembers in the *We Were Crewdogs* series, edited by Tommy Towery, complemented the survey responses, as did primary source documents from the conflict. In addition, the case study relies extensively on four important secondary works: William F. "B.A." Andrews, "To Fly and Fight: The Experience of American Airmen in Southeast Asia" (Ph.D. diss., George Mason University, 2011); James R. McCarthy and George B. Allison, *Linebacker II: A View from the Rock* (Maxwell Air Force Base, AL: Airpower Research Institute, 1979); Marshall L. Michel III, *The Eleven Days of Christmas: America's Last Vietnam Battle* (Encounter Books, 2001); and John Schlight, *The United States Air Force in Southeast Asia: The War in South Vietnam—The Years of the Offensive 1965–1968* (Office of Air Force History, 1968). Of those secondary sources, B.A. Andrews's "To Fly and Fight" was by far the most important and in fact provided the spark that led to this case study. "B.A." was an F-16 pilot and hero in the 1991 Persian Gulf War. He was also a tremendous colleague at the National War College and the Eisenhower School and a dear friend who passed away much too soon. Without his ground-breaking efforts—and inspiration—the following work would not have happened.

Background

Entering the Air Force's Active-duty force in 1955, the eight-engine B-52 "Stratofortress," dubbed "BUFF" by its crewmembers,⁸ was an aerial behemoth with a wingspan almost two-thirds the length of a football field and designed to deliver nuclear bombs. The bomber displayed America's aerial might at the height of the Cold War, with crews alternating between flying airborne alert missions with nuclear ordnance and serving "ground alert" with nuclear-laden bombers capable of takeoff 15 minutes after notification. The airborne alert missions, which had begun in 1960, ended in January 1968, but ground alerts endured throughout the Vietnam War. The B-52 force remained a key component of America's nuclear triad, which also consisted of land-based intercontinental ballistic missiles and nuclear missile-carrying submarines.

A crew of six operated the bomber: a pilot (the aircraft commander) and copilot, both responsible for flying the aircraft and conducting in-flight refueling as needed; a radar-navigator, responsible for bombing and generally the most experienced navigator onboard; a navigator, responsible for guiding the aircraft throughout its mission; an electronic warfare officer, also a navigator and responsible for defending the aircraft from surface-to-air missiles (SAMs) by jamming the signals they received from ground-operated sites; and an enlisted gunner, responsible for defending the aircraft from fighter attack with four .50-caliber radar-guided machine guns located in the tail of the aircraft. In all models of the B-52, the pilot occupied the left seat in the cockpit, while the copilot sat in the right seat, and the electronic warfare officer, dubbed "EWO" or "EW" on most crews, sat facing rearward behind the pilot and copilot. The navigator and radar-navigator sat in a cramped, windowless compartment underneath the cockpit nicknamed the "black hole" and connected to the cockpit above by a ladder. In the F and D model B-52s, employed most frequently in the Vietnam War, the gunner sat 150 feet behind the cockpit in the rear of the aircraft underneath its enormous tail in a small, windowed enclosure; in the G model aircraft, which began flying in war in 1972, the gunner sat facing rearward next to the EWO. An intercom system enabled all members of the crew to talk to one another, and when they communicated, they usually identified themselves by their crew position: "pilot," "copilot," "radar," "nav," "EWO," and "guns." The EWO taped those conversations for postmission debriefs. During lulls in the flights—a mission from Guam to South Vietnam and back took over 12 hours—the EWO or another crewman might play music over the system.

In case of an emergency requiring crew bailout, the pilot, copilot, and EWO had ejection seats taking them out the top of the aircraft, while the radar-nav and navigator had ejection seats taking them out the bottom—which meant that for takeoffs or landings they needed a

minimum of 1,000 feet of altitude to survive. In G models, the gunner had an upward-firing ejection seat; in Fs and Ds, he first had to jettison the gun turret and dive out of the hole created by doing so. If additional crewmembers rode in the aircraft (“jump seats” could appear in the cockpit behind the pilot and copilot), those individuals had to depart the bomber by bailing out through a hole created by the ejection of the radar-nav or navigator.

By 1970, roughly 400 B-52s were in service, and by May 1972 more than half were at Andersen Air Base, Guam, or at U-Tapao Royal Thai Air Base, Thailand, participating in the Vietnam War.⁹ The remainder, based in the United States, served as an alert force for a potential contingency that might require the use of nuclear weapons. Throughout the war, the nuclear mission of SAC had priority over the war in Southeast Asia. Air Force Chief of Staff General John McConnell, who had extensive service in SAC and had replaced General Curtis LeMay as chief in early 1965, reluctantly committed two squadrons of B-52Fs to Andersen Air Base that year after President Lyndon Johnson directed the bombers to attack enemy positions in South Vietnam.¹⁰ McConnell believed that worthwhile targets for B-52s were scarce in such an irregular conflict, plus General William Westmoreland, USA, the commander of Military Assistance Command, Vietnam (MACV), demurred from sending ground troops into areas bombed to determine the amount of damage inflicted. Ultimately, though, McConnell’s Service parochialism trumped his pragmatic views regarding the bomber’s utility in Vietnam. In September 1965, McConnell endorsed continued B-52 bombing in the war “since the Air Force had pushed for the use of airpower to prevent Westmoreland from trying to fight the war solely with ground troops and helicopters.”¹¹

Committing the B-52 to Vietnam required modifying it to carry conventional “iron” bombs while still retaining its capacity to drop nuclear ordnance. Engineers converted the F model’s bomb bay to carry 27 750-pound bombs and added wing pylons for an additional 24 bombs. In 1966, older D model B-52s, modified to carry 82 500-pound bombs or 42 750-pound bombs internally, and another 24 750-pound bombs on the wing racks, replaced the F models on Andersen.¹² Newer G and H models were also available, but SAC commanders reserved those for the nuclear mission. In the early 1970s engineers refurbished the G model to carry conventional bombs.

Still, its ability to carry 30 tons of ordnance made the modified D model a fearsome aircraft. B-52s flew between 30,000 and 35,000 feet in three-ship “cells,” where the first bomber led the one behind it by 1 mile, and the third bomber was 1 mile behind the second aircraft (with 500-foot altitude variations among the three, and the second and third bombers offset to the right and left, respectively, of the lead).¹³ A formation of two cells could obliterate almost everything

inside a rectangular area five-eighths of a mile wide by 2 miles long.¹⁴ Truong Nhu Tang, the Viet Cong's minister of justice who somehow survived multiple B-52 attacks, described a raid as "an experience in undiluted psychological terror." He recalled, "The first few times I experienced a B-52 attack it seemed, as I strained to press myself into the bunker floor, that I had been caught in the Apocalypse. One lost control of bodily functions as the mind screamed incomprehensible orders to get out."¹⁵ Most B-52 crewmen had little doubt about the ability of their aircraft to cause destruction. EWO Vince Osborne remembered his first sighting of the D model bombers in the paint scheme adopted for Vietnam: "They had new polyurethane black paint on the undersides, and camouflage on the top with the required fuselage markings in deep red. They looked like genuine war machines and I was in love."¹⁶

Many crewmembers found themselves less enamored with the actual job of attacking the Viet Cong and their North Vietnamese allies in the skies above South Vietnam. Once the B-52 campaign known as Arc Light began in June 1965, few crewmen could envision that the effort would continue unabated for almost 8 years with meager results to show for almost *four million* tons of bombs dropped in 126,615 sorties.¹⁷ During that span, the episodes of friction that they faced differed significantly from those that they had prepared to encounter while prepping for nuclear warfare.

Uncertainty, Chance, and Danger Over South Vietnam

Crews who flew the initial Arc Light missions in 1965 braced for a wartime environment, wearing helmets and staying strapped in their seats throughout the flights that lasted more than 12 hours, just as they would have done for nuclear bombing sorties. By the end of the year most refrained from such actions, realizing that the greatest amount of danger that they would encounter came not from enemy action but uncertainty and chance. Many survey respondents characterized the missions over South Vietnam as "milk runs" because the Viet Cong and North Vietnamese in the South had no means of firing at the high-altitude bombers. "We weren't much different than the truck drivers that drove the bombs from the port to the base," remarked navigator Eugene J. Daspit. "We were just the last leg of delivering the bombs to where they were needed on the ground." Pilot Doug Cooper made a similar analogy: "The job had all the excitement of being a long-haul truck driver without being able to stop for coffee."¹⁸ The relative ease of the missions caused one survey respondent to answer the questions anonymously. "The reason why I would not like my name mentioned," the individual stated, "is that in the grand scheme of things during the conflict, especially as compared to the crews who were involved in *Linebacker II*, is because I contributed so little to our cause." Still the Arc Light crews had much to concern them as they

flew the grueling 12-hour missions from Andersen, and that was also true for crews flying from U-Tapao, Thailand, which became operational for B-52s in 1967, and from Kadena, Japan, which briefly served as a B-52 base after the USS *Pueblo* incident with North Korea in January 1968.

Indeed on the first Arc Light mission of June 18, 1965, two B-52s maneuvering at night to refuel with KC-135 tankers collided, and the subsequent explosion killed 8 of the 12 crewmembers. When asked on the survey about the greatest threat to their safety during missions, 18 percent of respondents answered “other” instead of the remaining choices, “SAMs” or “MiGs.” The “other” choice was the clear preference for crewmen who had flown only over South Vietnam. John B. Gordon, an Arc Light participant in 1969–1970, observed that chance often played a major role in his missions. “After getting hit by lightning twice on the third mission and burning [out] three engines over the jungle on the fourth mission I was always concerned that something could go wrong,” he reflected. He added that on one occasion his gunner called out “Bandits!” (the alert for MiGs) instead of “Bogeys!” (the call for aircraft of unknown origin) the first time the gunner saw escorting Air Force fighters on radar, which elevated the fear factor for everyone onboard.

Larry C. Bagley, who flew more than 100 Arc Light sorties, listed midair collisions as his greatest concern, as did Paul Munninghoff, who added “mechanical issues with the aircraft.” Clifford B. Fallon, who flew Arc Light in 1968–1969, listed his greatest fear as “the B-52 falling apart,” while Raymond F. Milberg noted that during his Arc Light service, “We lost one or more crews in accidents due to aircraft age and fatigue.” Another pilot observed that after two aircraft crashed on takeoff from Guam in 1969 due to structural failure, “most of us were concerned that the overused airframes were dangerous. The section K [the listing of needed maintenance for the aircraft] of all the B-52D’s in theater had dozens of pages of ‘deferred maintenance,’ most of it corrosion.” To some extent, the bomber’s extraordinary amount of use—B-52s had flown 112,000 sorties in Southeast Asia by November 1972—caused crews to fly with a “structural” sword of Damocles above their heads, never knowing when the time might come for it to fall.¹⁹ Between June 1965 and October 1972, 12 bombers crashed or were lost due to operational accidents, with half of those losses occurring on takeoffs.²⁰

Besides the uncertainty regarding airframe stability, crews also had to deal with the possibility of friction resulting from carrying conventional ordnance. On the second Arc Light mission, not conducted until July 4, 1965, bombs loaded much earlier fell off the bomb racks of the lead aircraft onto the runway, the result of corroded wiring caused by rain and sea salt. Fortunately, none of the bombs exploded, but Guam’s climate provided continual tests for air and ground crews alike.²¹ For aircrews, determining if all the bombs had fallen from the aircraft during a bombing run presented a frequent challenge; no pilot wanted to land with “hangers,” or

bombs onboard. Poor lateral and rear visibility out of the cockpit windows caused Wing Commander Richard Hoban to raid the dental clinic for dental mirrors to determine if bombs had fallen from the wing racks.²²

Possible hangers in the bomb bay could produce a harrowing experience for the navigator. In those instances, the pilot had to descend to 16,000 feet to allow the crew compartments to depressurize, enabling the navigator to open the door to the deck behind his position. The navigator would first put on his 40-pound parachute, grab an emergency oxygen bottle and flashlight, and then bend down to maneuver onto a tiny crawlway leading to the bomb bay. If he found a bomb remaining in the rack, he had no way to determine whether the fuse had spun to arm the bomb, and a hard landing could cause it to fall out of the rack onto the bomb bay door, possibly with dire results. Navigator Kenneth Sampson, who flew 8 Arc Light tours totaling 363 sorties, recalled that after bomb release on an April 1967 mission, he went to investigate a warning light indicating a hung bomb. The pilot descended to 10,000 feet so that Sampson did not need oxygen, but Sampson neglected to put on his parachute. After determining an absence of hangers, he crawled into the wheel well, where he noticed an intercom station next to one of the aircraft's huge front tires. He plugged his headset into the connection and told the pilot that no bombs were in the bomb bay, but the pilot thought that Sampson had returned to his navigator seat and lowered the landing gear. "I found myself staring down at the blindingly bright, sunlit Gulf of Thailand!" Sampson stated. "I was kneeling on the narrow crawlway holding on to the old fabric rope grip with no parachute." Once the pilot realized his error, he raised the gear and Sampson managed to return to his compartment. "[I] reported to the pilot that I was back in my ejection seat. No more was ever said," he recollected.²³

For crews that encountered hangers either in the bomb bay or on the wing racks, landing was often a frightening affair. John Allen, a captain flying out of Andersen, recalled a mission in which his bomb bay doors would not open, causing him to divert to U-Tapao. He dropped the bombs on the wing racks into the sea but still had to land with a full load in the bomb bay. Meanwhile, the friction increased. Allen found that his left rear landing gear, containing eight tires total, would not extend, plus he was low on fuel. The emergency ground crew at U-Tapao foamed the runway, and Allen remembered his copilot "shaking and sweating" while he did the same, though he managed to land the bomber safely.²⁴

Stress for Aircrews Flying Over South Vietnam

For B-52 aircrews, friction could seemingly appear at a moment's notice, but stress added to the amount produced by uncertainty, chance, and danger. Clausewitz notes that stress comes

in two varieties—physical and mental. Arc Light crews suffered from both types. For crews on Andersen, physical stress resulted from the exertion required to fly missions that frequently exceeded 12 hours in length. Those missions could easily yield a “work day” of over 16 hours, with a minimum of 2 hours of premission planning and preflighting the aircraft, and another couple of hours devoted to postmission debriefing. Simply loading the bomber for a mission proved arduous for crewmembers. They had to carry a multitude of required publications (the basic technical manual for the bomber, known as the “Dash One,” was more than 1,000 pages long), plus cold weather gear in case cabin heat was lost, flight lunches, a cooler for beverages, helmets, headsets, and civilian clothes and extra uniforms in case the bomber had to divert to a different base. Should the aircraft breakdown before takeoff, crews had to unload all those materials and carry them to a spare B-52. On Andersen in particular, many of those dreaded “bag drags” occurred at night and in the rain. As a result of the lengthy sorties and the difficulties preparing for them, Andersen crews usually flew every other day, but the effort often produced intense fatigue. Several instances occurred of entire crews falling asleep during the course of a mission.²⁵

Crews at U-Tapao, who flew roughly 4-hour sorties that led to an 8-hour day after prebriefs and debriefs, generally flew 6 days straight and then had 1 day off. Unlike the Andersen missions, the U-Tapao sorties did not require air refueling because of their closer proximity to targets. Yet that immediacy meant that U-Tapao crews could surge much more readily than those on Andersen. Michael McCarthy, who flew 156 sorties during 3 tours, recalled that “during one twenty-one-day period in May and June of 1970 we flew twenty-one nights in a row. All you had to know was the [aircrew] bus pick-up time.” Clausewitz noted, “Among the many factors in war that cannot be measured, physical effort is the most important.”²⁶ For the B-52 crewmen, that effort sometimes drained their ability to perform at peak proficiency.

Mental stress also took its toll on the bomber crews, and it appeared in many forms. Most crewmen believed that the training that they received to fly in Vietnam was adequate, but 10 percent of those completing the survey did not. Before leaving the United States, crews generally received 2 weeks of training at Castle Air Force Base, California, to prepare them for Southeast Asia missions. Once they arrived in theater, they typically received one or two “over-the-shoulder” missions with an instructor monitoring their performance. Most respondents mirrored the comment of John Filmore Graham, who stated that the ground school segments and three flights that he received at Castle “trained us [for] what to expect in Vietnam. The instructors were extremely competent and experienced in the tactics used in the combat zone.” Howard Rose thought that “one additional week [of training] would have really helped, because

of the complexity and differences between the B-52G I was qualified in and the B-52D we flew in theater.” Ron Blum remarked:

There was a bit of a learning curve in adapting to the Southeast Asia flying environment. For instance, my first over-the-shoulder mission as a newly upgraded radar-navigator in 1972 resulted in a pretty rough bomb run, since I had just graduated from upgrade training at Griffiss Air Force Base, New York, in which there was almost total emphasis on the nuclear mission—not conventional ops as performed in Southeast Asia. Obviously, the SAC upgrade syllabus had not yet caught up with reality.

James D. Harford remembered that he did not get an over-the-shoulder mission, with an instructor-qualified pilot sitting in the jump seat reviewing his performance on an actual mission, when he arrived in Guam as a new aircraft commander in 1972. Harford already had logged 98 sorties as a copilot in 1970–1971, and schedulers deemed him qualified to move from the right seat in the cockpit to the left with no supervision.

Although SAC training contributed to minimal amounts of mental stress for the majority of crewmembers, SAC personnel policies contributed significantly to mental anguish. First, SAC leadership chose not to send crews on year-long assignments during the war, as was the case for Airmen in other commands.²⁷ Those other Airmen got credit for a “Southeast Asia tour” and did not have to fly in the war again unless they volunteered to do so. Bomber crews instead served in temporary duty (TDY) status at Andersen, U-Tapao, or Kadena for 179-day stints—the longest amount of time allowed for TDY deployments—and then returned to their regular stateside bases to pull nuclear alert duty for several months before rotating back to Southeast Asia for another 179-day TDY. Many crewmen repeated this process multiple times, and some survey respondents had six, seven, or even eight B-52 deployments to the war zone. To receive credit for a Southeast Asia tour, crewmembers had to transfer to another type of aircraft, qualify to fly in it, and then do so in Vietnam for a year. Afterward, those Airmen typically returned to the B-52—and the rotation cycle to Southeast Asia began again. Of the 85 survey participants, 80 served only in TDY status in B-52s during the war, while the remainder also had separate assignments as staff officers. Staff assignments were permanent change of station billets typically lasting 2 years that allowed a married officer to bring his family with him.

The SAC personnel policy guaranteed that crews would retain proficiency for the nuclear mission but also wrecked chances for many married crewmen to have a “stable” family life.

“TDYs were killers,” remarked EWO Cornelius Duggan, who flew 201 B-52 missions during the war. Jerry Smith, who flew in Vietnam from 1967 to 1969, agreed, noting, “The SAC mindset was cynical and manipulative with aircrews. TDYs were 179 days to avoid credit for a Southeast Asia tour. Some crews rotated TDY three or four times. While at home, we flew training missions and sat ground alert. During my last 2 years in SAC, I was gone from my wife and child 90 percent of the time.” EWO Tommy Towery observed, “The running joke during my time [in B-52s] was that the three things you got on an Arc Light trip were a Seiko watch, a pair of brass candlesticks, and a divorce.”²⁸ For Paul Munninghoff, the separation became unbearable, so his wife “packed up and went to Guam and U-Tapao so that we could be together.”²⁹ That example was not unique, and Munninghoff estimated that at any one time between 15 and 20 wives had joined their husbands on Guam, though those families could not live in base housing facilities because of the officers’ TDY status. Yet a small number of survey respondents provided a different perspective on the TDYs, reflected by Howard Rose, who flew in 1968–1969: “When no family was around, we could concentrate on our job. If family were around, it would have been a distraction to me.” Because the D model bomber was the only one flying in Southeast Asia from 1967 to 1971, its crews suffered the agony of TDYs that others did not. SAC had 11,520 Airmen during the Vietnam War; of that total, 3,500 to 4,000 flew in Ds.³⁰

Besides the torment of TDYs, another mental stress that crews had to endure was the rigidity of flight procedures endemic to SAC. Created to deliver nuclear destruction, SAC operated according to strict guidelines that placed a premium on safely transporting those weapons and assuring their accurate placement on assigned targets. Despite the conventional character of the Vietnam War, many of the command’s stringent policies designed for the nuclear mission transferred to the conflict in Southeast Asia. When asked on the survey, “How much flexibility did you have in the tactics used to execute the missions you flew?” 44 percent of respondents answered, “None.” Thirty percent more selected the choice, “A minimal amount.” “We had zero flexibility and zero input,” one crewmember declared. Paul Johnson concurred, writing, “No flexibility. We were SAC, remember?” Jon Bisher added, “We were SAC guys and our primary mission was nuclear; those skills were key. That’s why SAC maintained such tight control. They wanted the way you were thinking to be the way they were thinking.” SAC set out to ingrain that mindset at the start of an officer’s career in the command despite the ongoing war in Vietnam. “From Day One, the emphasis was on nuke, nuke, nuke, and you may have to go to Southeast Asia,” Bisher remembered. That emphasis, he claimed, put a premium on preserving the aircraft. “If there was any risk to the goddamn airplane,” he reflected, “don’t do it. We could replace the crews, but not the aircraft.”³¹ Thomas K. Moore, a veteran of six Arc Light tours between

1967 and 1970, observed, “Tactics were not flexible. Rigid SAC procedures with only reactive changes when errors (often fatal) were noted. This rigidity led to the Arc Light 1 midair [collision].” Moore was correct that after the June 18, 1965, midair collision, air refueling procedures changed to allow more time between individual cells of bombers during the refuel process. Yet for the most part, SAC did not alter its nuclear approach to conventional war.

For many crewmembers, SAC’s inflexible policies were a dual-edged sword. On the one hand, they chafed at the rigidity and tried to counter it with small acts of defiance. Many referred to themselves as “crewdogs” or “POGs” (which stood for “prisoners on Guam”), and “Free the POGs” was a popular bumper sticker on vehicles at Andersen. At U-Tapao, crews stopped wearing regulation flight caps and instead wore baseball caps, complete with rank and distinctively colored to identify individual squadrons.³² During missions, rather than speak over the intercom when uncertain about procedures and risk disciplinary action when SAC inspectors played the recorded tapes of aircrew conversations, some crewmembers would pass handwritten notes to one another.³³ EWO Tommy Towery recalled storing his Dash-One in a massive three-ring binder with poor holding power, and placing it in his flight brief case open-end first. Thus, when an inspector opened it to determine if Towery had made the required pen and ink annotations, all 1,000 pages would fall out, preventing the inspector from checking it.³⁴

Many crewdogs were especially chagrined by members of the SAC headquarters staff at Offutt Air Force Base in Omaha, Nebraska, who took advantage of the monthly combat pay policy that awarded the pay based on whether an individual flew over Southeast Asia for at least 1 day during the month in question. “During missions we sometimes had lieutenant colonels and colonels from SAC Headquarters who flew with us to get ‘combat pay,’” Jerry Smith recalled. “They’d fly one mission on the last day of the month and one on the first day of the month and then return to Omaha. While flying, some would criticize my crew on items on which they had no knowledge or expertise.” Paul Johnson added, “Higher ranking non-rated officers flying just to get combat pay were a problem and a nuisance, especially out of Guam. Crewmembers would often find these guys sleeping in our bunk area when we’d try to grab some shut-eye on those 10–12 [hour] round trips out of Guam.”³⁵

On the other hand, crews took pride in adhering to SAC’s rigid procedures. A major reason for the pride was that such adherence was the only measuring stick that they had to determine their contribution to the war effort during much of the conflict. Although 66 percent of survey respondents believed that they “were significantly contributing to the chances for U.S. victory in the war,” 18 percent stated that they were uncertain about how much they contributed, and 16 percent thought they made no contribution. Many of those who felt that they added to the

prospects for American victory could not understand how their actions improved the chance for success. Although crewmen may have known of President Johnson's stated political objective of a "stable, independent, non-communist South Vietnam," many could not fathom how the constant array of Arc Light flights improved South Vietnam's odds for stability, independence, or avoiding communism.³⁶ President Nixon's vaguely stated goal of "peace with honor" proved even more difficult than Johnson's objective for evaluating the results of missions. One navigator stated that his crew bombed "jungle coordinates that seem[ed] to do nothing except put deep holes in the jungle floor." Henry Hoffman III, who flew from 1967 to 1969, agreed, adding, "Mostly we just tore up jungle." Radar-navigator Ron Blum recalled, "We received little to no feedback on the results of specific missions, so we really had no way to gauge our impact on the war." Thomas Herbst, who served in Southeast Asia in 1968 and 1969, stated, "As a crewmember, I don't recall much feedback on the purpose of our bombing results. Consequently, it was difficult to feel that we were making a contribution to the war effort. . . . [We] accomplished the mission assigned, although the mission was not well defined and communicated to the crews." Aside from missions such as Khe Sanh in 1968, in which bomber crews understood that they supported the besieged Marine base, crews rarely knew when their bombing had made a difference. As a result, they determined "success" according to how well they followed SAC procedures, to include how accurately they placed their bombs on the chosen target. "B-52 crews were largely unable to gauge the effects of their attacks, which frustrated them and deprived them of a potential source of motivation," noted B.A. Andrews. "Bomber crews then turned inward for validation of their efforts by judging how precisely they adhered to SAC's standard operating procedures. . . . Until *Linebacker*, SAC crews were not worried about being killed; they were worried about criticism from commanders and their staffs."³⁷

Starting in April 1966, the SAC leadership heightened the frustration of many crewmembers by stripping away a key aspect of crew responsibility for the attacks on targets in South Vietnam—the act of bombing itself. SAC began deploying ground radar systems known as Combat Skyspot, previously used to evaluate training bomb runs in the United States, with modifications that allowed the Skyspot radar operators to direct B-52 bombing against enemy positions with greater accuracy than the aircrew could achieve on its own.³⁸ "After the middle of 1968, all missions were flown using Skyspot," reflected navigator Michael McCarthy. "A guy on the ground told us where to drop the bombs. We did not use the radar bombing equipment at all." Many pilots already flew much of the mission, including the bomb run, on autopilot, while the EWO and gunner had little real work to do on sorties over the South. Combat Skyspot marginalized the utility of the radar-navigator and made missions over South Vietnam more of

simply a routine affair that became ingrained alike among aircrews and SAC leadership. Clausewitz observed that such routine in war is often inevitable: “We recognize in these repetitions a ready-made method [of war], and see that even the highest ranks are not above the influence of routine.” Yet he also warned: “The danger is that this kind of style . . . can easily outlive the situation that gave rise to it, for conditions change imperceptibly.”³⁹ In the case of B-52 crewmembers, wartime conditions would change suddenly and dramatically in 1972. When that transformation occurred, many of the routines established over South Vietnam would prove inadequate for the type of war existing over the North.

In the meantime, crews did what they could to deal with the situations that they encountered. To relieve mission stress—or boredom—67 percent of survey respondents stated that they read books or magazines, 62 percent reported that they drank at a bar or the officers’ club, 56 percent stated they exercised or ran, and 49 percent stated that they wrote letters (respondents could choose multiple responses). One aircraft commander, who served in Southeast Asia from 1967 to 1969, stated that he “mostly drank. A doctor later diagnosed me as ‘self-medicating,’ using alcohol to relieve the tension.” Other survey respondents reported shopping, touring, or going to the beach during their time off, while less than 10 percent stated they telephoned home—doing so was expensive. One crewmember stated, “I telephoned home exactly once, at about \$6.00 per minute from Guam after the birth of my third child.” On the long missions from Andersen, all crewmembers had ample free time to accomplish other tasks. Radar-navigator Ron Blum wrote letters to his wife or played chess with the navigator; another crewmember stated that he worked all the problems in a high school algebra textbook. Thomas L. Webster, a veteran of 4 deployments spanning 244 missions between 1966 and 1970, completed both Squadron Officer School and Air Command and Staff College by correspondence. Samuel J. Roberts studied to become a dentist. Once the bombers began to fly over North Vietnam in 1966, the crews on those sorties found that the increased danger significantly reduced the time available—as well as the inclination—to focus on non-mission-related pursuits.

Uncertainty, Chance, and Danger Over North Vietnam, Laos, and Cambodia

For B-52 crews, the out-country air war—that occurring outside the borders of South Vietnam—began on December 11, 1965, with a mission against the Mu Gia Pass in Laos, a transshipment point near the North Vietnamese border for men and supplies headed south. Four months and one day later, B-52s attacked the North Vietnamese side of the pass, marking the bombers’ first raid on North Vietnamese soil. Mu Gia became a frequent target for B-52s, and

by the end of March 1966 crews had flown more than 400 sorties against it and the associated highways and byways to the south that comprised the Ho Chi Minh Trail.⁴⁰ Attacks on the trail steadily increased, and by October 1970, B-52s flew 27 sorties a day against it.⁴¹ More than a year earlier, beginning in spring 1969, B-52s had also raided targets in Cambodia as a part of President Nixon's "secret bombing." B-52 missions against enemy positions in Cambodia continued until August 1973 and constituted the final U.S. airstrikes of the war.

All out-country missions brought elevated levels of friction with them, with the greatest amount occurring during sorties over North Vietnam or portions of Laos near the North Vietnamese border. Those missions brought crews within range of North Vietnamese air defenses, significantly increasing the element of danger that they encountered; in December 1972 during the *Linebacker II* operations, the spike in danger was exponential. For the crews flying the secret missions over Cambodia, uncertainty and chance caused the greatest concern because the sorties were covert operations requiring precise bomb delivery against targets just inside the Cambodian border and away from civilian populations. Ron Blum, a navigator at the time, recalled for those missions, "The pilots were not briefed as to what countries they would be bombing—only the nav crew [was and] we were required to sign a non-disclosure agreement." Fellow navigator Michael McCarthy remembered that Cambodian sorties in spring 1970 all transpired at night, "so there would be no pictures taken to show where we bombed." Yet for all out-country missions, regardless of whether they occurred over North Vietnam, Laos, or Cambodia, crews still had to deal with the multitude of frictional elements previously confronted on sorties over South Vietnam.

Although the first B-52 mission over the North did not provoke a North Vietnamese reaction, subsequent ones did. Major Alfred Foss remembered that the briefings before initial sorties over North Vietnam's portion of the Mu Gia Pass "left the general impression that a good percentage of the people wouldn't be coming back from this raid." The mission was uneventful, but in September 1966 the North Vietnamese first fired an SA-2 SAM at a bomber, which missed. The appearance of SAMs soon increased. Copilot Joe Peters, who flew in 1966–1967, recalled that "we hung a wingtip over North Vietnam/Laos once or twice [and the] EWO reported SAM signals. Woke us all up." Phil Glenn recalled SAMs fired at his aircraft over Vinh in 1968, and Samuel P. Finch saw his first SAM in 1970. One copilot remembered that his three-ship cell had three missiles salvoed at them in the southern part of North Vietnam "that actually came kind of close. The gunner said that he watched one explode about a quarter mile above and behind us." MiGs also became a threat as the bombers ventured farther north. B-52s evaded MiG attacks in October and November 1971, causing General Bruce K. Holloway, the

SAC commander, to ground the entire B-52 fleet in Southeast Asia because of the apparent failure of fighter escorts to ward off the MiGs.⁴² For survey respondents who flew over the North, 75 percent listed SAMs as their greatest threat, and 8 percent listed MiGs.

Once B-52s began flying outside of South Vietnam, the importance of the EWO, gunner, and radar-navigator to mission success skyrocketed. No longer did the EWO have to relegate himself simply to recording intercom conversations and hauling publications onboard the aircraft; his skills in jamming SAM data-link transmissions to ground radar sites were vital in keeping danger to a minimum. EWO Harold H. Hughes recorded this logbook entry before a *Linebacker II* mission against Hanoi:

*We were going downtown. The big Kahuna. To SAC crews, this was a very frightening experience because they never thought they would fly real combat missions. So here was a real combat mission staring them in the face. Actual combat that could and would get people killed. The crew treated me totally differently after the mission briefing that night. All of a sudden, I was not the secretary any more, but the guy who could make 55 square meters of aluminum disappear, thereby saving our collective butts. I was now an integral part of the crew.*⁴³

Similarly, the gunner now assumed a key responsibility for negating danger by keeping MiGs at bay. Combat Skyspot continued to eclipse the radar-navigator for bombing in Cambodia and southern Laos, where its radar still had the range to direct attacks. Yet for missions deep into North Vietnam—the missions that “counted” most to crews and commanders alike—the radar-navigator was on his own in terms of dropping bombs, and he had to deal with chance occurrences like headwinds or tailwinds, as well as the difficulty of pinpointing specific targets via the aircraft’s radar system. On missions over North Vietnam, Laos, and Cambodia, the value of the navigator’s skill escalated as well.

To the crews flying the *Linebacker II* missions between December 18 and 29, 1972, the danger that they encountered was unlike anything they had seen before. B-52s had attacked targets in Haiphong only once during the war, in April 1972, but had never flown against Hanoi—widely viewed as the world’s most heavily defended city—until the operation’s first missions on the night of December 18. The men who did so found it an unforgettable experience. Richard L. Jones, who would fly three *Linebacker II* missions, counted 56 SAMs fired at the formation that he led on the operation’s first night. “We had 30 SAMs launched at us,” recalled John Filmore Graham regarding that night. “Our target was Phuc Yen Airfield and we had to accomplish a

combat turn over downtown Hanoi.” Reflecting on the December 18 raid, Bruce Woody later wrote, “Many SAM calls, with [our] gunner calling two. New levels of fear being explored. Job getting done, despite being scared out of one’s wits.”⁴⁴

Flying in cell formation as they had over the South, the bombers attacked in three waves on the first three nights, striking targets at 7:45 pm, midnight, and 5:00 am local time. A total of 129 B-52s, comprising 54 B-52Gs and 33 B-52Ds from Andersen and 42 D models from U-Tapao, made the assault on December 18.⁴⁵ Sixteen cells—48 aircraft—comprised the first wave, and roughly 40 aircraft flew in both waves two and three. Targets consisted of the Kinh No storage complex, the Yen Vien rail yard, and three airfields surrounding the city. All three waves attacked the same targets, flying the same altitudes and flight paths to them. North Vietnamese SAMs downed three bombers and severely damaged two others. For the next 2 nights, crews repeated the template flown on the first night, with 93 B-52s attacking the Thai Nguyen thermal powerplant and Yen Vien rail yard in three separate waves on December 19, and 99 bombers in three waves raiding Yen Vien, Thai Nguyen, and the Kinh No and Hanoi oil storage areas the following night. A multitude of SAMs once more threatened the bombers, while MiGs also roamed the skies. On the second night, SAMs damaged two B-52s but scored no kills, seemingly vindicating the repetitive routing. Yet the next night, SAMs downed six bombers and damaged a seventh—the greatest losses suffered on a single night during the campaign.

Chance and uncertainty contributed to the losses in many ways. First, on December 18, crews turned into a 100-knot jet stream after releasing their bombs that reduced their ground speed from 600 knots to 350 knots.⁴⁶ “That left us in the lethal SAM zone an extra 17 minutes,” John Filmore Graham stated. The winds were nearly 20 miles an hour stronger and differed from the direction projected by the forecast, and they dispersed the chaff corridor that support aircraft had provided to help protect the bombers from SAMs.⁴⁷ The winds remained strong on nights two and three. Second, SAC headquarters dictated that since crews would face a high-intensity combat environment similar to that expected for attacks against the Soviet Union, pilots would make a 45-degree turn to the east after completing the bomb run. The post-target turn was a holdover from SAC’s nuclear mission, in which pilots were to make a hard turn after releasing ordnance to escape the nuclear blast effects. Doing so during *Linebacker II*, however, inadvertently blacked out the radar emitters on the underside of the aircraft, preventing the EWO from jamming the data-links used to guide SAMs. While the post-target turn and repetitive routing significantly heightened the amount of friction that aircrews encountered, those measures also removed much of the uncertainty faced by North Vietnamese SAM operators. Now knowing the precise path that bombers would take to target, the North Vietnamese dispatched MiGs to

determine the bombers' altitudes and then fired many of their SAMs ballistically, nullifying the jamming capability that the B-52s had before making the turn off-target. Richard Jones believed that the North Vietnamese fired most of their SAMs in that manner, a sentiment shared by many survey respondents.⁴⁸

A third reason for significant amounts of uncertainty stemmed from the radar-jamming systems available to EWOs onboard the various models of B-52s. D model bombers possessed the ALT-6B Unmodulated ECM [electronic counter measures] Transmitter, the newest jamming system developed. G model bombers, which had deployed to Guam and U-Tapao for the first time in the war in spring 1972, had not all received the latest jamming equipment. Only 57 of 98 deployed G models possessed the ALT-6B; the remainder had the older ALT-22 Modulated Transmitters.⁴⁹ Lieutenant General Gerald Johnson, the Eighth Air Force commander at Andersen, tried to get the G model jammers upgraded before *Linebacker II*, but SAC headquarters refused, claiming that the ALT-22s were equally effective.⁵⁰ "What we didn't know was that our ALT-22 Modulated ECM Transmitters could be countered by SAM crews," navigator Robert G. Certain wrote.⁵¹ Certain's crew would discover that deficiency too late, as SAMs downed his aircraft over Hanoi on December 18. "The G model ECM equipment was never modified as the D was for high-level operations and as such was almost useless in many situations," stated Howard Evans, who flew B-52Gs from Andersen during *Linebacker II*.⁵²

By the night of December 20, the G model's jamming problems were well known, yet incredibly SAC headquarters scheduled six Gs in the second wave to bomb Hanoi's Yen Vien rail yard alone while 21 B-52Ds attacked other targets away from Hanoi. General Johnson telephoned the SAC commander, General J.C. Meyer, in Omaha expressing concern, telling Meyer that time remained to recall the Gs. In turn, Meyer called Admiral Thomas H. Moorer, the Chairman of the Joint Chiefs, and Air Force Chief of Staff General John D. Ryan, asking for advice. They replied to Meyer that the decision was up to him. Meyer determined that prudence should prevail, recalling the six G models minutes before they started their bomb runs.⁵³ Amazingly, Meyer refused to use the same logic to cancel four cells of G models slated to attack Hanoi's Kinh No storage complex in the night's third wave. Members of the SAC staff convinced General Meyer that the command would lose credibility if it continued to limit raids, and the third wave flew as scheduled.⁵⁴ As a result, SAMs downed two B-52Gs in the third wave, killing 9 of 12 crewmembers.

The first three nights' losses caused Strategic Air Command Headquarters, which had planned the routes of flights for the B-52s in North Vietnamese airspace (the Eighth Air Force staff at Andersen planned the remainder of the routing), to trim the numbers of B-52s that flew

the next 3 nights to 30 each evening, a number that U-Tapao alone could handle. Ultimately, SAC transferred responsibility for planning the entire mission to General Johnson and Eighth Air Force after a 1-day bombing pause for Christmas. Yet even with the reduced number of flights between December 21 and 24, North Vietnamese defenses remained a danger, and SAMs claimed two B-52s on December 21. On December 26, General Johnson brought Andersen's bombers back into the war along with those of U-Tapao, dispatching 120 B-52s against Hanoi and Haiphong to strike 10 different targets in 15 minutes. Four waves totaling 72 aircraft simultaneously attacked Hanoi from four directions, while concurrently, two waves of 15 bombers each struck Haiphong from the east and south, and 18 B-52s bombed the Thai Nguyen rail yard north of Hanoi.⁵⁵ The innovative routing confused the North Vietnamese, who had used the Christmas pause to restock their missile supply, though they still managed to down two B-52s with SAMs. Two more bombers fell to SAMs on December 27, the last bomber losses of the campaign.

Throughout *Linebacker II*, crews tried desperately to overcome friction and survive the lethal environment. Despite receiving orders not to maneuver on the bomb run to avoid SAMs, many pilots and copilots did what they believed was necessary to escape enemy air defenses. "Shortly after the EWO had notified us of the SAM radars looking at us the copilot said, 'Two SAMs at 1130,' and I started maneuvering the airplane in a 20-degree, 40-degree corkscrew, which was the only approved and totally ineffective maneuver that B-52 were to use to avoid SAMs," recalled pilot Wade Robert regarding his December 19 mission against the Hanoi rail yard. As a result of the failure of that technique, Robert "stood the B-52 on one wing with near 90 degrees of bank and missed a SAM that was glued to [his] windscreen."⁵⁶ EWO Cornelius Duggan knew of one pilot who flew the gargantuan bomber upside down to evade missiles.⁵⁷ EWO Don McCrabb's pilot maneuvered so violently on the December 21 mission that the bomber, number three in the cell, ended up in the number two position and was fortunate to avoid a midair collision.⁵⁸ Ron Blum's pilot banked 60 degrees in his post-target turn after attacking the Haiphong rail yards on December 26, similarly separating his bomber from the rest of his cell.⁵⁹ Glenn Russell reflected, "It was not uncommon for cell integrity to be broken in the process of avoiding SAMs after bomb release."⁶⁰

Many crewmembers blamed SAC for the repetitive routing that made such maneuvers necessary. "We were like ducks in a carnival," John Filmore Graham stated, describing the first 3 days of *Linebacker II*. "Same heading, same altitude, precise timing between cells. We also made 45-degree bank post-target turns which took ECM off of the targeted defenses." Ron Blum agreed: "It was unconscionable that the first sorties of *Linebacker II* were straight and

level high-altitude bomb runs by three-ship cells, the same tactics that were used in unopposed bombings in South Vietnam.” Blum further remarked:

*The nuclear mindset of SAC undoubtedly played a role, although this late in the war, that should have been no excuse for not immediately employing imaginative tactics in a high-altitude bombing campaign against targets defended by SA-2s. But SAC was used to planning the SIOP [Single Integrated Operational Plan, the plan for nuclear attack against the Soviet Union], in which you took the plan off the shelf and flew it “as briefed.”*⁶¹

One navigator and *Linebacker II* veteran observed, “Whoever was responsible for the first phase route planning should have been fired. Obviously, they had no skin in the game. They must have all been comfy and warm in their homes in the States. I’ve often wondered if any of them had any real combat experience.” Jon Bisher concurred, expressing the perspective of many survey respondents: “Real field mission planning, no matter how screwed up, is always going to be better than some headquarters guy that doesn’t have a horse in the race. One can become damn innovative if it is your ass on the line.”⁶²

Feelings of fear followed by helplessness consumed many crewmembers as they entered the combat zones over Hanoi and Haiphong. Pilot Jerry Wickline saw more than 100 SAMs and noted that at least 30 came within 1 mile of his airplane on his December 27 mission against the Hanoi rail yard. “My mouth was so full of cotton I could barely talk, and the whole time I thought I would be dead the next second. . . . Several times I was blinded by a near missile detonation or from the brilliant glare of their rocket trail as they went past me. The B-52 right behind me was shot down.”⁶³ D model gunner Karl Nedela, sitting beneath the tail of the giant bomber and watching the “fireworks” to the rear of the aircraft, checked his emergency equipment, peered in his radar looking for MiGs, and said simply, “You’ve got it, Lord.”⁶⁴ EWO Vince Osborne recorded the interphone and radio transmissions from his second *Linebacker II* mission and recalled the point where the copilot said he has counted 26 SAMs and will now stop counting. “For a long time after that flight, I would get chills when I listened to the tape—literal chills with the hair on my arms standing up.”⁶⁵ Richard Jones stated the 100-millimeter antiaircraft artillery (AAA), which could reach above 30,000 feet:

was more frightening than the SAMs. I could see the SAMs, and tell that they were not guiding on us, but one could not see the AAA shells coming up. I could

*see the bright, instantaneous flashes, like a strobe light or flashbulb, when they did explode—some fairly near our aircraft. I have to admit, I flinched a few times when one exploded that close. I was careful not to say anything about that to the rest of the crew who had no windows to look out of—no need to make the situation worse.*⁶⁶

Osborne's comment mirrored that of many crewmembers who emphasized camaraderie to counter the danger, uncertainty, and chance in the skies over North Vietnam. Crewmembers were less than thrilled by the environment that they had entered, but realized that to survive it, all six men would have to work together, and they trusted everyone to do his job despite the fear. That mindset carried over to perspectives on other crews as well. "The mission over Hanoi on December 27, 1972, was a nightmare I will not soon forget," stated Jerry Wickline. Yet he added, "I found out on that mission I was not a coward. I begged for an excuse to turn that airplane around and not fly through those missiles, but I was more afraid of being branded a coward than of dying."⁶⁷ The *Linebacker II* sorties were all "press on" missions, meaning that crews could not abort even if they had degraded equipment, to include radar, remembered pilot Ed Petersen, who flew six sorties from U-Tapao during the campaign.⁶⁸ EWO Cornelius Duggan, who flew three *Linebacker II* missions from Andersen, referred to them as a "maximum effort."⁶⁹ The tense nature of the raids tightened the bonds that naturally existed among the crewmembers, creating a "band of brothers" mentality not unlike what World War II infantryman and philosopher J. Glenn Gray found during his combat service. "Loyalty to the group is the essence of fighting morale," Gray wrote, and the collective joy of survival not only strengthened relationships among crewmembers but also gave them hope that they could make it through another such ordeal.⁷⁰ Pilot John Allen, a veteran of three *Linebacker II* missions from Andersen, remembered, "When we were no longer under the threat of SAMs and MiGs, and you could see the flashing of the rotating beacons now turned on from other B-52s heading east across the Pacific, the joy was indescribable. Our EWO patched the Doobie Brothers' 'Listen to the Music' into the interphone system and we played it over and over on the way back to Guam while we all sang along."⁷¹

The euphoria of survival consumed most crews who evaded the gauntlet of North Vietnamese fire—as well as the crewmen ordered away from the target area by the G model Wave Two recall on December 20. "My reaction to the recall was unabated elation," reflected radar-navigator Ron Blum, who flew in bomber *Ivory 3* that evening. He added:

I had no burning desire to go to downtown Hanoi. Our cell (actually a 6-ship wave) received the coded recall word when we were maneuvering toward the IP [initial point for the bomb run]. The [navigator] and I decoded the message and concurred that it spelled out "Recall." But then an interminable period of time went by, presumably in discussions aboard Ivory 1 [the wave's lead aircraft], where the Mission ABC [Airborne Commander] resided. We were getting closer and closer to the IP, and we were concerned that the ABC was not going to make the right decision, based on the message. But then, Ivory 1 finally came up on the interplane and declared the recall, and our cell broke off from the rest of the bomber stream. I don't remember much chatter among the crew after the recall, but speaking for the [navigator] and myself, we were delighted to be guaranteed to see another sunrise.⁷²

The crewmen ordered to turn back felt no shame in doing so; indeed, they viewed themselves as complying with the directions of higher headquarters. While many Airmen were not thrilled by the prospect of flying into the teeth of North Vietnamese air defenses, almost all did as ordered, though the deadly combat environment heightened stress levels throughout the campaign.

Stress for Aircrews Flying Over North Vietnam, Laos, and Cambodia

For B-52 crewmen flying the out-country missions, uncertainty, chance, and danger increased significantly the closer that sorties got to the North Vietnamese heartland surrounding Hanoi and Haiphong, and that knowledge took its toll on the men slated to fly in those areas. On missions to Cambodia and southern Laos, the crewmembers facing the most mental stress were the navigators and the radar-navigators, though the availability of Combat Skyspot for many of those sorties kept anxiety to a minimum. All crewmembers realized the danger posed by North Vietnamese defenses, which became evident once the North Vietnamese first fired a SAM at bombers in September 1966. As the missions inched northward, the likelihood that a SAM or MiG might find its mark intensified, and the notion of chance began to appear more as a probability rather than a random occurrence. After numerous near-misses and several damaged bombers, SAMs finally claimed a B-52 on November 22, 1972.

By that time, more than 12,000 personnel crowded Andersen—a base designed for 3,000—with the influx of flight crews and maintenance personnel in response to President Nixon's order in early 1972 to put more than half the B-52 fleet in Southeast Asia.⁷³ Many aircrews jammed

into barracks, with all six crewmembers living together in two connecting rooms with a single bathroom in between. The cramped conditions often produced turmoil. Jon Bisher recalled that his crew had one small locker and one refrigerator, with everyone getting one-sixth of the space available in each. When the radar-navigator removed the copilot's peanut butter from the refrigerator to replace it with beer, hard feelings ensued. Bisher further remembered a paucity of furniture in the quarters, and that crews made up for the shortage by taking furniture from the rooms of crews that had been shot down.⁷⁴ On December 16, 1972, 2 days before the start of *Linebacker II*, all crewmembers received orders to stay on base, including those married TDY crewmen who had brought their wives to Guam with them and had lived away from Andersen. That edict heightened the tension that crews already felt before the campaign began.

The apprehension surrounding *Linebacker II* increased as word of an impending major operation began to spread. On December 16, the staffs of the various wings stationed at Andersen and U-Tapao learned of the missions. The next day, aircraft commanders—including those scheduled to return to the United States on December 18—found out “that they should be prepared to fly a series of maximum effort missions on the 18th” although they did not receive specific target information.⁷⁵ Finally, at 11:00 a.m. on December 18 at Andersen—after a 1-hour delay in start time—Colonel James R. McCarthy, the 43rd Strategic Wing Commander, pulled back a curtain in the large Arc Light Center briefing room on base and declared, “Gentlemen, tonight your target is . . . Hanoi!”⁷⁶ The crew reaction was “dead silence,” EWO Vince Osborne reflected. “While I’m sure many of us had long thought that the correct military approach to this war was to try and win it, we also must have understood the true danger of flying a huge airplane into the most strongly defended airspace the world had seen to that point in history.”⁷⁷ Wade Robert thought the scene resembled one from the movie *Twelve O’ Clock High*: “The curtain flew open and we saw the big map of North Vietnam that had a big red bull’s-eye with HANOI written across it. What a surprise! The briefing room remained totally silent and I’m sure cheering was expected similar to the reaction of General Savage saying ‘BERLIN,’ but on balance the crews sat there with very serious looks on their faces and mentally screaming, ‘Oh, shit!’”⁷⁸

The crews on Andersen had additional reasons to be apprehensive. Before the briefing, McCarthy had given aircraft commanders letters threatening court-martial to anyone who took evasive action to avoid enemy defenses during a bomb run over North Vietnam; in his briefing, he repeated the restriction on maneuvering.⁷⁹ SAC headquarters provided the impetus for that declaration. It had forbidden bomb run evasive maneuvering, requiring bombers to stabilize flight for approximately 4 minutes prior to bomb release.⁸⁰ “The first time I had the opportunity to use my proficiency training in order to accomplish the mission and defeat enemy reaction,

I was prohibited under threat of court-martial,” noted Richard Jones.⁸¹ At U-Tapao, “we were briefed not to maneuver on the bomb run,” navigator Eugene Daspit recalled, but that was the extent of the message there. “I heard from friends that flew missions out of Guam that they were threatened with court-martial if they took evasive action on the bomb run even though we had been trained to do that in our normal SAC training.” Crewmembers at Andersen were further discouraged after learning that no search and rescue aircraft would support the mission.⁸²

The tension in Andersen’s Arc Light Center rose to a fever pitch at the end of the December 18 briefing. At that point, a chaplain offered to provide last rights for Catholics, an occurrence that became a ritual at the conclusion of all *Linebacker II* mission briefs. “That made it difficult to keep my crew motivated,” Jon Bisher remembered. “The gunner was Catholic and all I know was it seemed pretty final to me and the crew. If you were not concerned before, you were after this event and certainly after Day One carbon copy missions were briefed. That put the fear of God into you then. Before, no one had thought of coming back from nuclear missions; [it] felt similar for *Linebacker II*.”⁸³ Vince Osborne recalled that chaplains came out to chat with crews on the flight line before takeoff: “If we had ever thought that this was going to be a routine mission, that thought began to dissipate as this singular departure from normal events occurred.”⁸⁴ After the chaplains’ flight line appearances, Osborne loaded his .38 for the first time before a sortie. John Allen reflected, “The chaplain would get up and pray for us all—and that just got worse. The more we flew, the worse it got. After the thing rolled for a while, as a grown man, you could hear the sobbing. . . . I hate to even talk about it—it was that bad. It was—it was that bad.”⁸⁵

The seeming finality of the *Linebacker II* missions—in terms of the prospects for personal survival—elevated crew stress throughout the 11-day ordeal. “There is little of the play element about combat, however much there may have been in training for it,” Glenn Gray writes. “Instead, for most soldiers there is a hovering inescapable sense of irreversibility. ‘This is for keeps,’ as soldier slang is likely to put it.”⁸⁶ Airmen viewed the *Linebacker* campaign the same way. John Allen, whose first *Linebacker II* mission came on the night of December 20, remembered:

*There wasn’t a whole lot of time devoted during the briefing to the intelligence aspect of what your target was. All you knew was that you were going “Downtown,” and that you might not be coming home. If they had told you that the world was made of green cheese, you wouldn’t even have heard it—all you were thinking about was, were you going to make it back or were you not . . . and what about the guy sitting next to you.*⁸⁷

EW Cornelius Duggan, who, like Allen, flew his first of three *Linebacker II* missions from Andersen on December 20, recalled, “We were in shock—we lost so many planes and friends.”⁸⁸ Seeing commanders and chaplains visiting the wives of downed crewmembers heightened the stress for Airmen on Guam.⁸⁹ Richard Jones recalled that Katie Turner learned outside by the Andersen officers’ club pool that her husband did not return from a sortie.⁹⁰ EW James Rash, who also flew from Andersen, observed that the physical exhaustion of the continual missions added to the mental stress of losing comrades. “It was a 13- or 14-hour mission for 20 or 30 minutes over hostile airspace,” Rash stated. “[That’s] a long time to sit in dread of a few minutes and later a long time to relive those minutes, all of which is very fatiguing and uses up a man’s reserves of energy if done every other day for two weeks or so. In fact, flying without combat on that schedule would take a very strong man not to suffer.”⁹¹

Such perspectives mirrored those of many crewmembers, though other Airmen provided somewhat different views. Pilot Robert D. Clark, a major at the time, led the third wave of bombers from Andersen on December 18. He recalled that “everybody got cranked up. I was ready to do it; my nav was just absolutely terrified; my gunner was a hawk. My EW was horribly curious about whether his equipment was going to work—he was excited but scared.”⁹² Navigator Eugene Daspit, who flew six *Linebacker II* missions from U-Tapao, thought that SAC training and general crew competency would enable him to survive. He wrote on his survey:

I think that I had a concern [for personal safety] but never felt that I would be the one to get shot down. I had a mission to do and just went out and did it. I don’t think I had much more concern than on an everyday training mission. I had a lot of confidence in the ability of the EW to do his job to protect the aircraft as well as the pilot team’s ability to handle any situation. I actually flew with substitute EWs for my first four Linebacker II missions as our crew EW was on emergency leave. I had just as much confidence in them as our crew EW.

Daspit’s outlook resembled that of many survey respondents who were either young or unmarried during the air campaign. Les Dyer commented that he was not concerned for his personal safety on any missions: “I was young, bulletproof, and invulnerable.” Paul Munninghoff agreed. “When you’re 26 you’re so full of yourself that you don’t appreciate the danger,” he reminisced. “I was never anxious except slightly over North Vietnam during *Linebacker II*—but then you always assume that the bad things will happen to somebody else—and they did.”

The apparent certainty of “bad things happening” produced a multitude of reactions from crews. “We immediately viewed it as bad form to keep sending bombers over Hanoi in a single file at the same altitude, airspeed, and heading so that even the least competent North Vietnamese antiaircraft crews could become fairly efficient. Add to that the prohibition on taking evasive action, and you had a formula for unhappy crewmembers,” Munninghoff recalled. Most Airmen appreciated that once the campaign progressed, SAC replaced the 4-minute restriction on maneuvering during the bomb run with simply a requirement for “straight and level” at bomb release;⁹³ crews also welcomed the change in tactics initiated by General Johnson in the December 26 mission that relied on multiple axes of attack in simultaneous assaults to minimize exposure to enemy defenses. Still, as Warren Dixon noted, “even when the run-in headings were changed the post-target turn tactic was not. Unnecessary losses were still incurred.”

Many Airmen at Andersen were further dismayed to learn that wing commanders waived the mandated hours of crew rest between missions for some crews because insufficient numbers of flying personnel were available. At the start of the air offensive, Eighth Air Force scheduled more than 70 B-52Gs from Guam to fly each evening. “We had 144 aircrews and had to refly some of the crews starting the second night without the required 12 hours of crew rest,” recollected Howard Rose, an Arc Light veteran from 1968–1969 who served at Andersen as a G model scheduler during *Linebacker II*. He continued, “Almost every day we had to waive crew rest for one or more crews in order to get crews for the last cell or two. . . . Starting with the second or third day, we had to show how many *Linebacker II* missions each crew had flown and prove that we had an equitable distribution for each crew.” Following that direction was difficult, Rose observed, because “the commanders wouldn’t tell us which crews were downed. We only found out when we put them on the schedule and were then told they were not available.”⁹⁴ D model schedulers went through similar machinations with their crews. Yet after the December 20 raids, which were the last for Andersen until December 26, Eighth Air Force dispatched 22 Andersen-based D model crews to U-Tapao so that crews assigned there did not have to fly every day during the campaign.⁹⁵

The stress produced by consistently flying on short notice in a lethal environment, the restrictions on maneuvering, the requirement for the post-target turn, and, for the first 3 days, repetitive routing to targets caused some crewmembers to report to sick call rather than endure the agony over Hanoi and Haiphong. Howard Rose remembered that Andersen’s DNIF (Duty Not Including Flying) rate was about 12 to 15 per day before *Linebacker II* began. Once the operation started, it edged up to the low twenties, and then “slowly crept up to about three times the normal (or about 36–45 per day).”⁹⁶ The increased DNIF rate led to more crews sac-

rificing crew rest to fly the sorties required. Paul Munninghoff described the heightened sick call numbers as a “strike,” a term used by other crewmembers, while some referred to it as a “mutiny.” “The ‘strike’ consisted of some number of B-52 crewmembers choosing to get ‘sick’ and temporarily on DNIF status to avoid what seemed to be an unacceptably high risk of being shot down and maybe killed because of the brain freeze at Omaha,” Munninghoff reflected. “I personally knew of two friends who went on strike and heard second-hand of several others. Oddly enough, there was no immediate push-back from management and no hint of their being ostracized by other crewmembers—they were understood to have moral qualms about the tactics, and nobody at the time seemed inclined to criticize them.”⁹⁷ Pilot Ted Hanchett, who flew four *Linebacker II* missions, stated:

*I can attest to crew desertions, and why the mindset was set to do so. . . . The mindset was a combination of two things. One would be the impatience of lonely wives at home, and the [other was] the frustrated desire of “warriors” to finish this war. This impatience was manifested in the longevity of the conflict. We kept putting our lives at risk when we could end this quickly if our leaders wanted to do so.*⁹⁸

Other Airmen downplayed the “strike” and its impact, stressing instead the commitment of crewmembers to completing the missions assigned. “The expected danger was not considered a reason not to go among most crews,” Jon Bisher recalled. “Being sick or toasted was also not considered a valid reason not to fly.”⁹⁹ Navigator Eugene Daspit observed, “I know much has been said about crews threatening mutiny. That is totally untrue.” He continued:

I know there were a couple of individuals that refused to fly and I am sure a few who went on DNIF to avoid flying. My pilot was DNIF for our last mission and he said he would have done anything to go and the waiting for us was worse than the flying. Also our EW came back early from his emergency leave when he learned what was happening. Most of the talk of mutiny was probably just Crewdogs bitching about the tactics. We didn’t like them but we were going to fly anyway. If you told us that was the sun, we would probably have argued that it was the moon. SAC Crewdogs always had to have something to bitch about but when it came time to do what they were trained to do, they did it.

Nevertheless, the stress of combat ultimately caught up with many Airmen at both U-Tapao and Andersen, and crewmembers released that anxiety in a variety of ways. The officers' clubs at both bases filled with Airmen trying to cope with their experiences. Bill Beavers remembered that he frequented the U-Tapao officers' club for "several rum and coke drinks (six to eight per visit) after almost every B-52 sortie."¹⁰⁰ At Andersen, crewmen were not allowed in the main part of the officers' club and instead had to eat and drink in the back of it in a "casual bar." Robert Clark described the casual bar's atmosphere as "uninteresting" and "desultory" before the operation began. "By the second day [of *Linebacker II*], Clark remembered, "you would walk in there and you could smell the fear. Guys were hanging on each other and just revalidating the fact they're still alive, and they were getting all that fear out in the open."¹⁰¹ Jon Bisher noted that fights often occurred in the casual bar, and crewmen once walked through the formal section of the club with tampons on forks.¹⁰²

Some crewmen were especially rambunctious on holidays. During the Christmas Day bombing pause, some Andersen crewmembers took over the base radio station and then moved on to the officers' club, throwing its Christmas trees into club's swimming pool. On New Year's Eve at U-Tapao, a group of B-52 gunners went to the facility of the Red Horse Engineers and stole their mascot, a small horse, which they then took to the officers' club and paraded across the dance floor, in full view of the commanding general there.¹⁰³ Meanwhile at Andersen that evening, permanent party personnel scheduled an event in the main part of the club, prohibiting TDY aircrews from attending. The Airmen took exception. One crewman took a survival kit out of a bomber and put sea marker die in the swimming pool, fired pen-gun flares over the golf course, and placed a life raft into the middle of the dance floor, pulling the tab in the middle of the celebrating crowd, which was pushed in all directions when it inflated.¹⁰⁴ Bisher provided an explanation for such actions—and the lack of repercussions for them: "If you're a prisoner on death row, you're pretty free to do what you want. . . . The attitude was they can't do anything to you—they're not going to send you home—they needed the crews."¹⁰⁵

One of the most significant displays of crew emotion occurred on January 3, 1973, when SAC Commander General Meyer visited Andersen to address its crews. By then *Linebacker II* had ended, yet Airmen still flew against North Vietnamese targets south of Hanoi and Haiphong, and the environment remained lethal—on that day, SAMs claimed another B-52. Meyer's first visit to the base had occurred in spring 1972, after Nixon's buildup of the bomber force on Guam was in full swing. The general brought his family with him on that trip, angering many Airmen who had been away from their families for extended periods. During a question-and-answer session with crewmembers, one Airman noted the stress that frequent

deployments produced on marriages, and Meyer reportedly answered that “some marriages weren’t meant to last.”¹⁰⁶

On January 3, those crewmembers not flying assembled in the Arc Light Center briefing room, where they first watched Meyer pin the Air Force Cross on Colonel McCarthy, who had flown two missions during the operation. Meyer then addressed the Airmen in the audience, and his message was blunt. The general elaborated on the need for cell integrity in the missions over North Vietnam, remarking that tight formations provided the greatest chance to thwart the SAM threat by using the combined jamming capability of three bombers to defeat the data-links guiding the missiles. He then stated that aircraft commanders were not to maneuver during the bomb run and repeated the court-martial threat that they had previously received at the start of *Linebacker II*. At that moment, the briefing room became totally silent—all whispered conversations stopped, the normal coughing that typically comes from any audience halted, and no one moved. Then, suddenly, roughly half the Airmen in attendance stood up and walked out, “like a herd of cattle,” John Allen remembered.¹⁰⁷ Many of those were chagrined that McCarthy had flown only two missions, plus that he had done so from the jump-seat of G model aircraft, though qualified only in D models.¹⁰⁸ Allen described what came next:

Of the roughly 200 that remained, 75 to 80 people just went crazy. They picked up whatever was nearby and threw it at the stage—flight computers, briefing books, Coke cans, folding chairs, you name it. It was like if you had ever been to a burlesque house, where they’d throw tomatoes and apples at a bad act, it was just like that. It couldn’t have lasted more than 13 seconds, the assault, but [Meyer] got hit a bunch of times. I saw a Coke can bounce right off his head. I was just frozen in my tracks—I couldn’t do anything—it was mob action. He went down on a knee, and a bevy of colonels picked him up and helped him off stage. Meanwhile, the guys jumped up on stage and physically chased him down to the flight line. There were a bunch of guys running after him, including the guys that were “gone” and the others of us that just wanted to see what would happen. He was in his staff car, heading toward his airplane, a shiny silver and white VC-135. They chased him down to where they now have the B-52 [Arc Light Memorial] up on a pedestal. They ran down and they threw chunks of gravel that were next to the road, just pelting his staff car and the power cart [used to start engines], and continued to pelt him as he went up the ramp. Then off he went and we never heard anything more from CINC [commander in chief] SAC.¹⁰⁹

Others recalled the briefing. “J.C. Meyer got a less-than-enthusiastic welcoming,” EWO Cornelius Duggan stated.¹¹⁰ Ed Petersen, who was stationed at U-Tapao at the time, remarked that word soon reached Thailand about the “unusual show of respect for a four-star general.”¹¹¹ James A. Rash, an EWO assigned to Andersen, recollected:

I do distinctly remember General Meyer came to Andersen [Air Force Base] and did hold a briefing. He was definitely booed and treated without courtesy—in fact—I was at the time, and still am embarrassed by the memory of the discourtesy and anger expressed by crewmembers for their commander. It was a disgrace. General Meyer could not finish his comments due to the discourtesy of the crews and left the stage and shortly left the base. Most of these crews had spent too many hours in the air in a hostile environment over the past two weeks. They had first-hand intelligence on the effectiveness of evasive maneuvers in counteracting SAMs. . . . And a good many of us had friends who we were living in close comradeship with a few days ago and now they were dead (some captured). . . . Probably about 90 percent of the SAMs in North Vietnam were shot in the first three or four nights of those raids, and the other 10 percent were fired as maintenance got them ready. So, by the time the general was talking to the crews there weren’t many SAMs to evade, but the nights the sky was full of them was still alive in the crewmembers’ minds, along with the confusion, fear, darkness, and desire to stay alive! Indescribable [emphasis in original].¹¹²

Rash believed that Meyer’s comments were not the only motive for the reaction of the disorderly crewmembers. “Many crews felt their missions were poorly planned and when local personnel were questioned, their excuse was, ‘orders from SAC.’ [That was] another reason that the SAC Commander may have been a figurehead for the aircrews’ disgruntlement,” Rash contended.¹¹³

For many bomber crews, Rash’s assertion doubtlessly rang true; they believed that the heightened friction they had experienced during *Linebacker II* stemmed directly from actions taken by SAC. And in many respects, they were correct. General Meyer had served only one tour in Strategic Air Command before becoming the commander. He had made his name as a fighter pilot and had been one of America’s leading aces in the European theater during World War II. He often deferred to his staff for key decisions, as he demonstrated regarding the third wave of G models attacking from Andersen on December 20, and he did so as well regarding the initial routes to target for the first 3 days of *Linebacker II*. For that planning, Meyer and his

staff had surmised in August 1972 that the President might order a major attack on the North Vietnamese heartland with B-52s. SAC headquarters requested a plan from General Johnson and the Eighth Air Force staff for the possible raids and received a proposal with multiple axes of attack in a minimum time span, similar to the attacks that actually occurred on December 26.¹¹⁴ On December 14, President Nixon gave the order for *Linebacker II* to begin 4 days later, and Meyer determined that SAC—rather than Eighth Air Force—would plan the assault. SAC planners initially developed a design mirroring what Eighth Air Force had submitted. Yet when the SAC Deputy Chief of Staff (DCS) for Operations, Major General Peter Sianis, who had an extensive SAC background, reviewed the initial proposal, he balked.

According to Colonel Frederick J. Miranda, SAC's logistics representative on the planning staff, General Sianis saw the map prepared by staff officers that showed routes of flight for the operation, with "several different routes leading to Hanoi." Miranda related what next occurred:

General Sianis walked out of his inner office, took a look at the map, and said, "That's not the way we do it!" Then he removed the colored tape showing the Andersen B-52 routing from the map and rerouted that bomber stream to a route over South Vietnam into Laos and forming up with the U-Tapao bomber stream. He also changed the post-target exit routing to one requiring all aircraft to make a right turn after dropping bombs and stated, "One way in and one way out!" He then instructed his staff to go make those changes and come back with the briefing. I will never forget how the map looked after General Sianis made changes. The colored tape was hanging loosely and the general made a comment, "You guys probably have a lot of tape, don't you?"

This was a significant last-minute change resulting in replanning, additional poststrike refueling, and the now infamous "post-target turn." He essentially took the planning function away from the majors and lieutenant colonels and straitjacketed them with the "one way in, one way out" directive. No one questioned the SAC DCS/Operations.¹¹⁵

The action of Sianis—and the failure to act by Meyer—in no way excuses the crew reaction that Meyer received on January 3, but it does show that a commander's failure to take friction into account can have serious ramifications not only for the survival chances of the crewmembers who must implement the plan designed, but also for the morale and discipline of the crews who must do the job. The way that Sianis and Meyer orchestrated *Linebacker II* significantly

increased the friction that crews would encounter. “As far as we were concerned,” one member of the Eighth Air Force planning staff remembered, the plan received from SAC “was a new plan” that bore little resemblance to what Andersen’s officers had submitted.¹¹⁶ General Johnson quickly realized that SAC’s plan would subject his crews to maximum doses of danger and futilely demanded that SAC change the B-52 routes to target. “By the time [word of *Linebacker*] got to me the decision to go had already been made,” Johnson lamented, remarking that he could make only *recommendations* regarding the size of the force, tactics to be employed, altitudes to be employed, and the like.¹¹⁷ “General Johnson just blew his cork when [SAC] wouldn’t change the axes of attack,” stated an officer at Eighth Air Force Headquarters. SAC had projected a 3 percent loss rate for the attacking force, but some loss rate estimates at Andersen went into double digits. One Andersen staff officer reflected, “When I saw the map [showing the flight path to target], I realized two things: that the weight of effort would be very large, and that it was not going to be a turkey shoot—unless you were on the ground up there.”¹¹⁸

After Meyer departed Guam, the chaos stemming from his visit dissipated as crews returned their focus to flying missions against North Vietnam, and Eighth Air Force commanders directed them to do what was necessary to stay alive in accomplishing the mission.¹¹⁹ Meyer also briefed crews at U-Tapao, and although he received a “frosty” reception there, it did not approach the hostility displayed at Andersen.¹²⁰ For the crews at both U-Tapao and Andersen, the war continued, with uncertainty that *Linebacker II* would spur the North Vietnamese to negotiate an end to the war at the Paris Peace Accords that had restarted in early January. On January 14, 1973, North Vietnamese SAMs claimed their final B-52 of the conflict, shot down over Vinh. Less than 2 weeks later, American, North Vietnamese, and South Vietnamese representatives signed the peace accords, ending America’s active engagement in the war in North and South Vietnam. Yet for most B-52 crews, that event did not signal an end to America’s combat role. The bombers continued to attack communist Khmer Rouge forces in Cambodia until August 15, 1973, when the Senate voted to cut off funds for the operation.

Despite the stress resulting from uncertainty, chance, and danger, many crewmembers expressed disappointment when *Linebacker II* ended and the bombing of North Vietnam came to a halt, though they were proud of what they had accomplished. “I felt we just stopped when we were winning and that was a big mistake,” reflected navigator Eugene Daspit. John Allen’s view typified the perspective of many Airmen:

After the tenth day [of Linebacker II] there were no missiles, there was no AAA, there were no MiGs, there was no threat. . . . But all of the sudden Nixon declared

*to the world that we would stop, and we stopped. . . . And that was the biggest frustration—after losing your buddies, busting your ass, and going through what you had to go through, all of the sudden, with all the intel indicating that it was almost over, and we stopped. I just can't understand it; I can't.*¹²¹

Allen was correct that the North Vietnamese had fired most of their SAMs by the end of *Linebacker II*, creating a combat environment that was less dangerous than when the operation had begun on December 18. His viewpoint further revealed that—as was the case with many crews flying Arc Light in South Vietnam—they had no real appreciation for the air offensive's political objective, and thus they determined their own “measure of merit” to justify the losses suffered. Many *Linebacker II* crewmen translated Nixon's political goal of “peace with honor” into the return of American prisoners of war (POWs). “Getting our POWs back was the only thing that gave us a sense of purpose,” gunner Jack Cortel wrote on his survey. George Thompson concurred, stating: “*Linebacker II* worked. North Vietnam came back to the Paris talks and the POWs came home shortly thereafter.” Jon Bisher was proud of the role he had played in helping to free American prisoners, and noted that afterward many had thanked him at reunions of Vietnam veterans. “The POWs knew from the bombing that they were going home. At the time we were just in it. Now you know that you did something that was worth something,” he remarked.¹²²

Still, the way that the war against North Vietnam concluded for the United States—with the January 1973 Paris Peace Accords ending its combat role against the North and securing American POWs, while permitting almost 100,000 North Vietnamese troops to remain in South Vietnam to help topple the Saigon regime in April 1975—put a bad taste in the mouths of many B-52 crewmembers. When asked if his efforts contributed to the U.S. chance for victory in Vietnam, Richard Jones responded, “It's not my opinion that matters. I trust the comments made by the POWs whose release, according to them, was directly attributable to our B-52 missions. We forced NVN [North Vietnam] back to serious negotiations at Paris, where they agreed to return our POWs. ‘Victory’ in the context of Vietnam was politically not achievable at that time. We abdicated the South Vietnamese government to get our POWs back.” Charles E. Hale, Jr., went further in his assessment, writing, “I lost many friends needlessly.” Richard Jones observed that he felt “joy at seeing POWs come home, but sad for all the losses that gained the U.S. nothing.” “I refuse to visit the Vietnam Memorial,” Jones opined. “Nothing heroic about that, a wall of losses, for no gain, due to political reasons.” One navigator who preferred to remain anonymous presented a harsh critique of America's entire war effort:

I've not consented to having my name used in a written study because even though I'm proud to have served as a B-52 crewmember, I've spent the last 40+ years trying to forget that damned war. As far as I'm concerned, that war was a useless waste of time, money, and human capital. And then, at the end of that whole effort, our political leaders tuck their tails and run, abandoning the very people to whom we made so many promises. Just the thought of that makes me physically ill.

The deepest fear of my war years, one still with me, is that these happenings had no real purpose," J. Glenn Gray wrote after his service in World War II,¹²³ and the survey results from B-52 crewmembers reflect that attitude as well. "Any fighting unit must have a limited and specific objective," Gray insisted, "and the more defined and bounded it is, the greater the willingness, as a rule, on the part of soldiers to abandon their natural desire for self-preservation."¹²⁴ For Airmen struggling to overcome friction in a war that seemingly had no overarching goal, Gray's words rang especially true.

Conclusions and Considerations

In his seminal study *The Face of Battle*, John Keegan alluded to the role that friction plays in warfare:

*What battles have in common is human; the behavior of men struggling to reconcile their instinct for self-preservation, their sense of honor and the achievement of some aim over which other men are ready to kill them. The study of battle is therefore always a study of fear and usually of courage; always of leadership, usually of obedience; always of compulsion, sometimes of insubordination; always of anxiety, sometimes of elation or catharsis; always of uncertainty and doubt, misinformation and misapprehension.*¹²⁵

Keegan's analysis aptly defines the conditions encountered by B-52 crewmen who flew over Southeast Asia during the Vietnam War. At the level of the individual as well as for individual crews, notions of self-preservation blended with honor and camaraderie in efforts to overcome anxiety, uncertainty, doubt, misinformation, and misapprehension. Most crews adopted a "band of brothers" mindset to combat friction, yet many also realized the amount of friction that came their way often stemmed from the directives they received from political and military leaders.

To many crewmembers, America's political leaders were responsible for much of the friction leading to the deaths of their comrades. When asked, "How did you feel about America's political leadership during the war?" 56 percent of survey respondents rated political leaders "not competent," while 29 percent rated them "somewhat competent." Only 1 percent of crewmembers rated political leaders "highly competent," with 9 percent rating them "competent"; 5 percent were "uncertain." "The military knew what to do; the politicians would not let them," stated Louis G. Hatch, who flew in 1968–1969. Charles E. Hale, who flew 225 sorties between 1967 and 1971, offered a similar assessment: "When the war is won, as in Vietnam, don't give away the victory by not staying the course." Some Airmen wrote that politicians handcuffed the air war and that military leaders should have resigned in protest of the political leadership's direction. "I was among those who at the time felt that the U.S. political leadership did not have victory as a goal," stated Thomas K. Moore, who flew in six Arc Light deployments. "I did my assigned duties as well as I could, but had no illusion that we would experience victory." Ted Hanchett, who flew two *Linebacker II* missions, added, "The soldier and the American citizen are often as intelligent as the leaders elected to 'represent' them. When the leaders of this country, using their *prideful* beliefs of superior intelligence falter, and fail to include the *main objectives* among the rank and file, then no good can be celebrated by either" (emphasis in original).¹²⁶

Survey respondents focused much of their wrath on National Security Advisor Henry Kissinger, Nixon's chief negotiator with the North Vietnamese at the Paris peace talks, and on President Johnson's Secretary of Defense, Robert McNamara. To many crewmembers, Kissinger was responsible for sacrificing the "victory" secured by *Linebacker II*. "I always felt that I won the war, but Kissinger lost it," commented Hanchett. Geoffrey Engels stated, "The joke was that the two best generals the North Vietnamese had were named McNamara and Kissinger." McNamara, a key architect of the "graduated response" approach to bombing North Vietnam during the Johnson administration, did indeed lose faith in the ability of airpower to achieve success, and beginning in late 1966 he advised Johnson to limit air raids on the North.¹²⁷ For Thomas Herbst, "Too much of the war was directly run from the President's office without apparent regard for sound military objectives. Secretary McNamara was more concerned with his image as an intelligent leader than as a sound strategist." Warren Dixon stated that he "had wished for far more effective choices of targeting. The whole concept of 'graduated response' was garbage. You fight a war to win, not tie. . . . I was proud of my crew, but disgusted with political leadership." *Linebacker II* veteran Les Dyer added a refrain echoed by many survey respondents: "Civilian control of the military is a given and desirable precept but civilian micromanagement of

operations is a recipe for disaster. Current Airmen must resist to the best of their ability.” Many respondents believed that if President Johnson had “unleashed” airpower over North Vietnam in an operation such as *Linebacker II*, it would have not only eliminated much of the friction encountered by B-52 crews but also won the conflict in short order.

Most B-52 crewmembers thought that America’s military leaders provided superior guidance when compared to their civilian chiefs, though many Airmen also condemned SAC commanders for amplifying friction throughout the conflict. In assessing military leadership, 17 percent of survey respondents rated it “highly competent” and 35 percent regarded it “competent.” Yet 29 percent rated it “somewhat competent,” 14 percent designated it “not competent,” and 5 percent rated it “uncertain.” Much of the dissatisfaction resulted from SAC’s direction of *Linebacker II*, especially the repetitive routing that increased danger for crewmembers. Noted one Airman, “SAC’s refusal to allow local commanders to make immediate operational changes to reflect the unexpected combat environment unnecessarily cost aircrew lives. Flying the same altitudes and ingress/egress routes repeatedly at the same targets at regularly scheduled times reflected incompetence at the highest levels and a betrayal by our leadership. This was inexcusable.” After reading Frederick Miranda’s account of the SAC Deputy Chief of Staff for Operations, Major General Peter Sianis, selecting the same bomber routes to target for *Linebacker II*’s initial phase, Paul Munninghoff remarked:

*If Miranda’s story is accurate then Pete Sianis is responsible for many aircraft losses and aircrew deaths, injuries, and captures. The tactics so casually rejected by General Sianis were later adopted (after many losses) and worked well. I am thoroughly dismayed by this revelation and hope that General Sianis goes (or has gone) to his grave burdened with the knowledge that he killed a lot of good men—men better than him.*¹²⁸

Henry Hoffman III called SAC leadership “awful” and bemoaned the selection of targets in Omaha rather than in-theater, a view shared by many survey participants. Hoffman further noted that “the legacy of stupidity at the staff level was denied, so I don’t know if we learned anything there.” Reflecting on his Arc Light experiences, Hoffman related that he had once made a suggestion not to refuel bombers flying from Okinawa, which would have saved thousands of pounds of gas—and dollars—each day. The refuel missions continued, however, because a general told Hoffman that he (the general) did not want to lose the tanker “sortie count.” To many commanders, the total number of sorties flown each day had become a warped measuring stick

to evaluate success in a war that often relied on quantification to indicate progress—and determine promotions.

E. Paul Johnson contended that “some of the higher ranking non-flying personnel definitely did not fall into the competent/highly professional category,” and many respondents blasted the careerism that they noticed among commanders and senior staff officers. “I considered many (but not all) of the lower levels of leaders (squadron and wing) competent. Third Air Division and Eighth Air Force were sometimes okay and at other times unfocused, but above that level I had no reason to suspect anything but political pandering,” stated Thomas K. Moore. Les Dyer wrote that “empire building was as big an issue in that day as it continues to be. My speculation is [regarding *Linebacker II*] that some colonel (or more than one) at Offutt said, ‘Why the hell should they get all the credit? We have the big picture and we’ll plan the show from here.’”¹²⁹ In a 2001 interview, pilot George Thatcher voiced the visceral discontent with his wing staff that mirrored the perspective of some survey respondents: “Most of the line flying troops didn’t have a lot of respect for the upper echelons of wing staff, who we always thought were a bunch of ass-covering careerists, who wouldn’t change anything because they’d be afraid they’d make a mistake and let themselves in for criticism while they were covering themselves with glory and making their promotions.”¹³⁰

To preclude political and military chiefs from discounting friction in the decisionmaking process, those leaders must first have a clear understanding of precisely what they are trying to achieve by combat—and the ability to communicate it in an understandable manner to their subordinates. Clausewitz noted that “the first, the supreme, the most far-reaching act of judgment that the statesman and commander have to make is to establish . . . the kind of war on which they are embarking; neither mistaking it for, nor trying to turn it into, something that is alien to its nature. That is the first of all strategic questions and the most comprehensive.”¹³¹

One might add that a second strategic question closely follows: Do those charged with actually fighting the war understand the kind of conflict that they will have to fight? Clausewitz further stated, “No one starts a war—or rather, no one in his senses ought to do so—without first being clear in his mind what he intends to achieve by that war and how he intends to conduct it.”¹³² Once more, those on the pointy end of the spear as well as those who design the strategy must understand—and agree upon—the answers to those questions.

Many B-52 crewmen never understood how their constant Arc Light missions translated into “victory,” or what the definition of victory was in a war that seemed to have no end. Although the prospects of danger from enemy action over South Vietnam were virtually nonexistent, uncertainty, chance, and stress were continual fiends that the Airmen faced again and

again in 179-day doses. The “routine” nature of Arc Light, without an apparent rationale for it, in aircraft susceptible to “hung” ordnance and other malfunctions made the possibility of friction more of a probability for aircrews. The professionalism displayed by Airmen was a major reason that most crews overcame the instances of friction that occurred. Indeed, for many crews, the determination of mission success was how well they adhered to SAC procedures in flying their assigned sorties.

For the political and military leaders who develop strategy, those individuals must pay special attention to Clausewitz’s admonition about knowing *how* they intend to conduct a particular conflict. They should have an understanding of—and an appreciation for—the intricacies of combat operations, and they should not only allow for friction but also expect that it will occur as a matter of course. They should further understand that increased complexity could heighten the prospects for friction, yet they should also know that straightforward and simple does not necessarily reduce friction’s likelihood. General Sianis’s repetitive, routine approach to targeting during the first 3 days of *Linebacker II* exponentially multiplied friction for bomber crews. In contrast, the complex assault by 120 B-52s attacking targets in Hanoi and Haiphong from multiple directions on December 26, 1972, significantly reduced danger for the Airmen. Colonel McCarthy’s prohibition on maneuvering—amplified by the threat of court-martial—heightened stress for crewmembers already concerned about flying into the teeth of North Vietnamese defenses. Once more, the skill and professionalism displayed by crewmembers enabled most of them to survive the friction encountered, though commanders could have limited it much more than they did.

Yet for political and especially military leaders, knowing the *kind* of war that exists and *what* it aims to achieve at the start of the conflict, as well as *how* to conduct it, is not in itself sufficient to reduce friction for those who must implement strategy in harm’s way. The political and military chiefs must also realize that both the type of war fought and its objectives may well *change*, especially for the United States in today’s era of modern limited war. Clausewitz observes, “the original political objects can greatly alter during the course of the war and may finally change entirely, *since they are influenced by events and their probable consequences*” (emphasis in original).¹³³ The realization that the initial goals are unachievable or the desire to achieve additional objectives can transform war aims—and in turn modify *how* the new aims must be accomplished. Many American generals and admirals in Vietnam failed to see a difference between President Johnson’s objective of a stable, independent, noncommunist South Vietnam and Nixon’s goal of “peace with honor,” perhaps because Nixon’s objective was so vaguely stated. In actuality, Nixon aimed to end America’s involvement in Vietnam, intending to obtain

the release of American POWs and establish a “decent interval” for South Vietnam’s survival in the process. Nixon also wanted to achieve those goals at a minimum cost. The loss of a large number of B-52s, America’s mightiest warplane and an essential component of its nuclear triad, would send the antithesis of the signal of strength and resolve that he wanted to convey to North Vietnamese leaders. Yet the total destruction of North Vietnam’s warmaking capability, which many crewmen sought at the end of *Linebacker II*, was not on Nixon’s list of objectives. His goals were far easier to obtain than Johnson’s, especially after the North Vietnamese launched their March 1972 Easter offensive that converted an infrequently waged guerrilla conflict into a fast-paced conventional war of movement that required vast logistical support and made it susceptible to bombing targets like rail yards and storage areas.

The savvy commander must be able to discern when such a change in political goals has occurred, and how achieving them could affect the magnitude of friction encountered. Clausewitz remarked that a keen intellect is an essential component of a competent commander, especially if that commander is to deal successfully with friction:

War is the realm of uncertainty; three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty. A sensitive and discriminating judgment are called for; a skilled intelligence to scent out the truth. . . . If the mind is to emerge unscathed from this relentless struggle with the unforeseen, two qualities are indispensable: first, an intellect that, even in the darkest hour, retains some glimmerings of the inner light which leads to the truth; and second, the courage to follow this faint light wherever it may lead.¹³⁴

Clausewitz labeled the first quality with the French term *coup d’oeil*, while he described the second quality as *determination*. A commander must indeed possess both to reduce the friction encountered by those in harm’s way. Sadly for B-52 crewmen during *Linebacker II*, both qualities were in short supply in SAC headquarters.

A key component of how SAC fought the war was its personnel policy. Survey respondents provided a nearly unanimous call for abolishing the 179-day TDY process that was a hallmark of their Vietnam service. Twenty-first-century U.S. military leaders have had great difficulty heeding that plea because an all-volunteer force in an era of constant war limits the options available. As was the case with many B-52 crewmembers, thousands of U.S. military personnel today suffer from the stress of recurring family separations provided by rotating TDYs to Afghanistan or Iraq. Commanders must take that stress factor into account in planning opera-

tions; more importantly, political leaders must make it a high priority consideration when “establishing the kind of war on which they are embarking”—and whether, given the likely friction involved—war is indeed a viable option.

Many survey respondents commented that realistic training was the best way for Airmen to eliminate friction. “Do the absolute best you can during your training because the next sortie may be for real,” Jon Bisher cautioned. “Saddle up when the klaxon sounds. Train hard while waiting,” remarked Joe Peters. Clausewitz would agree with such advice. Although he states that “combat experience” is the best “lubricant that will reduce the abrasion [of friction],” he also contends:

*To plan maneuvers so that some of the elements of friction are involved, which will train officers’ judgment, common sense, and resolution is far more worthwhile than inexperienced people might think. It is immensely important that no soldier, whatever his rank, should wait for war to expose him to those aspects of active service that amaze and confuse him when he first comes across them. If he has met them even once before, they will begin to be familiar to him.*¹³⁵

Such training is essential as well for military and political chiefs at the highest level. To have the best chance of reducing friction, those leaders—and their closest advisors—must participate in simulations that offer ample amounts of friction during the course of the exercises. More importantly, leaders need to see first-hand how their decisionmaking could increase—or decrease—friction for the men and women charged with applying force against an enemy, and who also must defend themselves from the force that the enemy sends in their direction.

In the final analysis, to minimize the impact of friction, those in harm’s way—and the military and political leaders who design war plans for them—must have the same understanding of why they are fighting and what it takes to secure “victory.” Combatants and leaders must share a specific definition of that term that all comprehend in the same manner, and all must have the ability to gauge whether they are on the desired path to achieving that goal. For U.S. Airmen in particular, who are likely to play a significant role in waging modern limited wars of seemingly unlimited duration with considerable sums of technology, those who fly and fight will always confront friction. Vietnam illustrated how political and military leaders affected the amount of friction encountered by the crews manning the most powerful weapon of that conflict, the B-52, and how those crewmen dealt with uncertainty, chance, danger, and stress for 8 long years. A common understanding of what the bomber efforts sought to achieve—by crewmen, com-

manders, and their political masters—would likely have reduced the friction encountered and saved American lives. Such a common understanding in current and future conflicts will go far toward decreasing friction, and will likely save American lives as well.

Notes

¹ Carl von Clausewitz, *On War*, trans. and ed. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 104.

² Ibid., 119.

³ Ibid.

⁴ Barry D. Watts, *The Foundations of U.S. Air Doctrine: The Problem of Friction in War* (Maxwell Air Force Base, AL: Air University Press, 1984).

⁵ Ibid., 108.

⁶ *Basic Doctrine*, vol. I (Washington, DC: Headquarters Department of the Air Force, February 27, 2015), 9, 39, available at: <<https://doctrine.af.mil/download.jsp?filename=Volume-1-Basic-Doctrine.pdf>>.

⁷ Clausewitz, 119.

⁸ The acronym stood for “Big Ugly Fat Fuck.”

⁹ Drew Middleton, *Air War–Vietnam* (New York: Arno Press, 1978), 115–125.

¹⁰ John Schlicht, *The United States Air Force in Southeast Asia: The War in South Vietnam—The Years of the Offensive 1965–1968* (Washington, DC: Office of Air Force History, 1968), 83.

¹¹ Ibid., 82.

¹² William F. Andrews, “To Fly and Fight: The Experience of American Airmen in Southeast Asia” (Ph.D. diss., George Mason University, 2011), 321–325; Charles N. Brown, “Vietnam and Linebacker II,” in *We Were Crewdogs*, vol. I, *The B-52 Collection*, ed. Tommy Towery (Memphis, TN: Instantpublisher, 2005, 2006), 114.

¹³ Marshall L. Michel III, *The Eleven Days of Christmas: America’s Last Vietnam Battle* (San Francisco: Encounter Books, 2002), 37.

¹⁴ Neil Sheehan, *A Bright Shining Lie: John Paul Vann and America in Vietnam* (New York: Random House, 1988), 618.

¹⁵ Truong Nhu Tang, *A Viet Cong Memoir* (New York: Vintage, 1985), 167–168.

¹⁶ Vince Osborne, “Becoming a Crew Dog,” in *We Were Crewdogs*, vol. I, 33.

¹⁷ Raphael Littauer and Norman Uphoff, eds., *The Air War in Indochina* (Boston: Beacon Press, 1972), 11, 168–172; Earl H. Tilford, Jr., *Crosswinds: The Air Force’s Setup in Vietnam* (College Station: Texas A&M University Press, 1993), 109; Carl Berger, ed., *The United States Air Force in Southeast Asia 1961–1973* (Washington, DC: Office of Air Force History, 1977), 167.

¹⁸ Doug Cooper, “Memories of a Former Crew Dog—Bored and Lonely,” in *We Were Crewdogs*, vol. III, *Peace Was Our Profession*, ed. Tommy Towery (Memphis, TN: Instantpublisher, 2007), 99.

¹⁹ Andrews, 362.

²⁰ Ibid., 324, 367.

²¹ Peter Seberger, “Early Arc Light,” in *We Were Crewdogs*, vol. IV, *We Had to Be Tough*, ed. Tommy Towery (Memphis, TN: Instantpublisher, 2008), 158.

²² Andrews, 194.

²³ Kenneth Boone Sampson, “The B-52 Bomber Wheel Well Door,” personal account sent to author, January 2, 2016. See also Vince Osborne, “The Door Rester,” in *We Were Crewdogs*, vol. I, 125.

²⁴ John Allen, telecom with author, January 15, 2016.

²⁵ See Seberger, 156; J.J. Parker, “Guam Moments,” in *We Were Crewdogs*, vol. III, 104–106; Kenneth Boone Sampson, “A B-52 Bomber Mid-Winter’s Night Dream,” in *We Were Crewdogs*, vol. III, 82–83.

²⁶ Clausewitz, 115.

²⁷ For fighter pilots flying over North Vietnam, the tour length was 100 missions.

²⁸ Tommy Towery, “A Seiko Watch, a Pair of Brass Candlesticks, and a Divorce,” in *We Were Crewdogs*, vol. IV, 209.

²⁹ Paul Munninghoff, email message to author, November 10, 2015.

³⁰ Andrews, 386.

³¹ Jon Bisher, telecom with author, November 20, 2015.

³² Andrews, 379–380.

³³ *Ibid.*, 376–377.

³⁴ Tommy Towery, “The Aircraft Bible—The Dash One,” in *We Were Crewdogs*, vol. I, 49.

³⁵ Paul Johnson, email message to author, November 9, 2015.

³⁶ On March 17, 1964, President Lyndon Johnson signed National Security Action Memorandum 288, which stated that the United States sought “an independent non-Communist South Vietnam [which] must be free . . . to accept outside assistance as required to maintain its security.” See Neil Sheehan et al., *The Pentagon Papers* (New York: Bantam Books, Inc., 1971), 283. Secretary of Defense Robert S. McNamara added in a March 1964 speech: “When the day comes that we can safely withdraw, we expect to leave an independent and stable South Vietnam, rich with resources and bright with prospects for contributing to the peace and prosperity of Southeast Asia and the world.” Quoted in Townsend Hoopes, *The Limits of Intervention* (New York: David McKay, 1969), 19.

³⁷ Andrews, 324–325.

³⁸ *Ibid.*, 352–353.

³⁹ Clausewitz, 154.

⁴⁰ Berger, 105.

⁴¹ Earl H. Tilford, Jr., *Setup: What the Air Force Did in Vietnam and Why* (Maxwell Air Force Base, AL: Air University Press, 1991), 180.

⁴² U.S. Oral History Interview of General John D. Lavelle by Lieutenant Colonel John N. Dick, Jr., McLean, VA, April 17–24, 1978, K239.0512-1036, Air Force Historical Research Agency (hereafter, AFHRA), Maxwell Air Force Base, AL, 593–596; Message, General Creighton Abrams to Admiral John McCain, MAC 11312, 1028Z, December 1, 1971, quoted in Lewis Sorley, *A Better War: The Unexamined Victories and Final Tragedy of America’s Last Years in Vietnam* (New York: Harcourt, Brace, and Company, 1999, 2007), 314.

⁴³ Captain Harold Hilliard Hughes, logbook entry, December 26, 1972, quoted in Arthur Craig Mizner, “Maneuver! Maneuver! Three SAMs—Six O’ Clock—Closing Fast,” *We Were Crewdogs*, vol. II, 235–236.

⁴⁴ Bruce Woody, “Your Target for Tonight,” in *We Were Crewdogs*, vol. III, 127.

⁴⁵ James R. McCarthy and George B. Allison, *Linebacker II: A View from the Rock* (Maxwell Air Force Base, AL: Airpower Research Institute, 1979), 41.

⁴⁶ Wade Robert, “A Night on the Town,” in *We Were Crewdogs*, vol. IV, 179.

⁴⁷ Michel, 92. “Chaff” consisted of thin metal strips designed to hide the radar returns of aircraft so that radar-guided defenses, such as surface-to-air missiles and antiaircraft artillery, could not attack them.

⁴⁸ Richard L. Jones, email message to author, January 27, 2016.

⁴⁹ Michel, 33.

⁵⁰ Ibid.

⁵¹ Robert G. Certain, “IP Inbound—The Final Minutes of Charcoal 1,” in *We Were Crewdogs*, vol. I, 135.

⁵² Howard E. Evans, email message to author, November 11, 2015.

⁵³ Michel, 154.

⁵⁴ Ibid., 156–157.

⁵⁵ McCarthy and Allison, 121–123.

⁵⁶ Robert, 175, 177.

⁵⁷ Cornelius Duggan, telecom with author, August 18, 2015.

⁵⁸ Don McCrabb, “A Birthday Trip to Remember,” in *We Were Crewdogs*, vol. II, 243–244.

⁵⁹ Ron Blum, email message to author, November 6, 2015.

⁶⁰ Glenn Russell, “Don’t Shoot Three—It’s Two,” in *We Were Crewdogs*, vol. IV, 169.

⁶¹ Blum, survey comments and email.

⁶² Bisher, telecom.

⁶³ Jerry Wickline, “Bailout,” in *We Were Crewdogs*, vol. I, 130.

⁶⁴ Karl Nedela, “Who’s Got It?” in *We Were Crewdogs*, vol. II, 245.

⁶⁵ Vince Osborne, “Linebacker II: A Personal Perspective,” in *We Were Crewdogs*, vol. I, 124.

⁶⁶ Richard L. Jones, email message to author, January 28, 2016.

⁶⁷ Wickline, 130.

⁶⁸ Ed Petersen, email message to author, November 11, 2015.

⁶⁹ Duggan, telecom with author.

⁷⁰ J. Glenn Gray, *The Warriors: Reflections on Men in Battle* (New York: Harper and Row, 1973), 47.

⁷¹ John Allen, telecom with author, April 20, 2016.

⁷² Ron Blum, email message to author, November 18, 2015.

⁷³ McCarthy and Allison, 12.

⁷⁴ Bisher, telecom with author.

⁷⁵ McCarthy and Allison, 40–41, 44–45.

⁷⁶ Michel, 71–72; Robert, 171–172.

⁷⁷ Osborne, “Linebacker II, A Personal Perspective,” 122.

⁷⁸ Robert, 171–172.

⁷⁹ Richard L. Jones, survey comment; Michel, 73.

⁸⁰ McCarthy and Allison, 46–47.

⁸¹ Richard L. Jones, email message to author, January 27, 2016.

⁸² Certain, 40.

⁸³ Bisher, survey comment and telecom.

⁸⁴ Osborne, “Linebacker II, A Personal Perspective,” 123.

- ⁸⁵ John Allen, interview with author, September 22, 1981, Osan Air Base, Korea.
- ⁸⁶ Gray, 51–52.
- ⁸⁷ Allen, interview with author.
- ⁸⁸ Duggan, telecom with author.
- ⁸⁹ Robert, 172.
- ⁹⁰ Jones, email message to author, January 27, 2016.
- ⁹¹ James A. Rash, letter to author, August 15, 1982.
- ⁹² Robert D. Clark, interview by author, January 6, 1983, Robins Air Force Base, GA.
- ⁹³ Michel, 136.
- ⁹⁴ Howard Rose, email message to author, November 15, 2015.
- ⁹⁵ McCarthy and Allison, 110–111. Marshall Michel states that 11 Andersen crews went to U-Tapao. See *Eleven Days of Christmas*, 156.
- ⁹⁶ Rose, email message to author.
- ⁹⁷ Munninghoff, email message to author.
- ⁹⁸ Ted Hanchett, crew survey comment and email to author, November 11, 2015.
- ⁹⁹ Bisher, telecom with author.
- ¹⁰⁰ Bill Beavers, “Story of the Chili Donut, U-Tapao, 1972,” in *We Were Crewdogs*, vol. II, 223.
- ¹⁰¹ Clark, interview with author.
- ¹⁰² Bisher, telecom with author.
- ¹⁰³ Karl N. Nedela, “A Few Shots from the Gunners,” in *We Were Crewdogs*, vol. I, 152.
- ¹⁰⁴ Tommy Towery, “Fading Memories, Odds and Ends, and Bar Stories,” in *We Were Crewdogs*, vol. I, 164–165.
- ¹⁰⁵ Bisher, telecom with author.
- ¹⁰⁶ Michel, 220.
- ¹⁰⁷ Allen, interview with author.
- ¹⁰⁸ Michel, 220; John Allen, letter to author, February 6, 1983.
- ¹⁰⁹ Allen, interview with author.
- ¹¹⁰ Duggan, telecom with author.
- ¹¹¹ Petersen, email message to author.
- ¹¹² Rash, letter to author.
- ¹¹³ Ibid.
- ¹¹⁴ McCarthy and Allison, 26.
- ¹¹⁵ Colonel Frederick J. Miranda, USAF (Ret.), Letter to the Editor, *Air Force Magazine*, December 2015, 6.
- ¹¹⁶ Major George Thompson, USAF (Ret.), interview with author, October 27, 1982, Omaha, NE.
- ¹¹⁷ USAF Oral History interview of Lieutenant General Gerald W. Johnson by Mr. Charles K. Hopkins, April 3, 1973, Andersen Air Force Base, Guam, AFHRA, file number K239.0512-831, 6–7.
- ¹¹⁸ Colonel Clyde E. Bodenheimer, interview by author, January 7, 1983, Maxwell Air Force Base, AL.
- ¹¹⁹ Allen, interview.
- ¹²⁰ Michel, 220–221.

- ¹²¹ Allen, interview.
- ¹²² Bisher, telecom with author
- ¹²³ Gray, 28.
- ¹²⁴ Ibid., 50.
- ¹²⁵ John Keegan, *The Face of Battle: A Study of Agincourt, Waterloo, and the Somme* (New York: Vintage Books, 1977), 297–298.
- ¹²⁶ Hanchett, email message to author.
- ¹²⁷ Mark Clodfelter, *The Limits of Air Power: The American Bombing of North Vietnam* (Lincoln: University of Nebraska Press, 2006), 99–100, 107–111.
- ¹²⁸ Paul Munninghoff, email message to author, December 16, 2015. Sianis died February 6, 1988.
- ¹²⁹ Les Dyer, email message to author, November 11, 2015.
- ¹³⁰ George Thatcher, interview by Jonathan Bernstein, November 15, 2001, Vietnam Archive Oral History Project, Texas Tech University.
- ¹³¹ Clausewitz, 88–89.
- ¹³² Ibid., 579.
- ¹³³ Ibid., 92.
- ¹³⁴ Ibid., 101–102.
- ¹³⁵ Ibid., 122.

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