

An Assessment on the Limitations on American Airpower during Operation Rolling Thunder
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Airpower played a significant role in escalating the United States' involvement in the Vietnam War. The first American bombing campaign in Vietnam took place from March 1965 to October 1968, called Operation Rolling Thunder. Rolling Thunder aimed to coerce North Vietnam to stop their support for the Viet Cong (VC) insurgency in South Vietnam. It was hoped that the campaign would boost the morale of South Vietnam and give credibility to the American commitment to contain communism.¹ However, Operation Rolling Thunder was ultimately unsuccessful as it failed to achieve any of its strategic objectives. The aerial campaign did not coerce the North Vietnamese into halting support for the Viet Cong. While the bombings did create complications for the North, they nevertheless were able to move more than an adequate number of supplies and men into the South. Operation Rolling Thunder failed to coerce Hanoi into halting support for the VC due to limitations with doctrine, political restraints, environmental conditions, and pilot training.

The doctrine employed by the United States Air Force (USAF) during Operation Rolling Thunder was ill-suited for a limited conflict in a guerrilla war. This was the doctrine of strategic bombing used by the United States Army Air Force (USAAF) during the Second World War. The idea behind strategic bombing is to destroy the enemy's ability to wage war by attacking their industry. Therefore, air planners designed a campaign that would target the industrial capacity of North Vietnam. It was hoped that the destruction of the North's meager industry would prevent their continued support for the Viet Cong. Targets of this aerial campaign included oil storage facilities, cement and steel factories, and electric power plants. The Air

¹ Robert A. Pape, "Coercive Air Power in the Vietnam War," *International Security* 15:2 (1990): 113.

Force also planned an interdiction campaign against the transportation system to prevent supplies from moving south.² However, the application of this doctrine to the Vietnam War suffered from several limitations due to the asymmetrical nature of the conflict, the underdevelopment of North Vietnam, and an underestimation of the North's will.

Rolling Thunder could not starve the Viet Cong of supplies due to their minimal needs in waging a guerrilla war and their ability to dictate the pace of battle. Of the Communist soldiers in South Vietnam, 245,000 of them were from the Viet Cong. These soldiers intermingled with the general population and did not frequently engage in combat. The totality of supply requirements to wage this kind of war was roughly 380 tons a day, of which only 34 tons were needed from sources outside the South. This roughly amounts to only one percent of the tonnage imported into North Vietnam. In fact, the bombings helped the VC extract more supplies from its allies. Hanoi, by pointing to the bombings, was able to extract more imports from the Soviet Union and China. This only helped to increase the aid North Vietnam could give to support the insurrection in the South.³ Furthermore, because the VC dictated the pace of battle, it allowed them to extract supplies from within South Vietnam. This significantly reduced the degree to which the Southern insurgents relied on the North for supplies. The nature of the conflict in South Vietnam was such that the guerrilla fighters had marginal material requirements, making the strategical objective of starving the VC a futile effort.⁴

Rolling Thunder failed to destroy the economy of North Vietnam because of the North's underdevelopment and external support. The bombing offensive caused extensive damage to the military, transportation, and economic infrastructures of North Vietnam. However, even with all

² Mark Clodfelter, *The Limits of Air Power: The American Bombing of North Vietnam* (New York: Free Press, 1989), 101; 125-7.

³ Clodfelter, *The Limits of Air Power*, 134-5.

⁴ Pape, "Coercive Air Power in the Vietnam War," 128.

this destruction, North Vietnam was not drastically harmed economically. This damage was offset by the external support received by North Vietnam from China and the Soviet Union. The North received these materials along supply routes immune from attacks from the USAF.⁵ Furthermore, attacks on oil storage and electric power plants had a minimal effect on Hanoi's war effort because North Vietnam was undeveloped. Hanoi only required 32,000 tons of oil per year to operate its economy, which was easily fulfilled by its dispersed sites. Powerplants were also non-essential to the economy of North Vietnam, and they could compensate for lost plants with generators.⁶ The American doctrine of strategic bombing was suited to fight a highly industrialized nation like Germany in WWII but ill-equipped for what the Air Force faced in Vietnam. Therefore, while the USAF was successful at destroying the North's industry, it could not harm them economically because of external support and their minimal material requirements.

Lastly, the United States leaders heavily underestimated the will of the North Vietnamese to continue their support for the insurgency in the South. American leaders and the Joint Chief of Staff strongly believed that North Vietnam would crack under the pressure of destruction created by Rolling Thunder. However, these leaders knew nothing about the North Vietnamese intentions nor the extent to which they would carry out the war.⁷ North Vietnam was able to organize a vast labour force of over 300,000 individuals to repair damage to their transportation system. This displayed the firm determination of the North to quickly offset the destruction of the bombings to continue to move supplies south.⁸ Besides counteracting interdiction efforts, the

⁵ Ricky James Drake, *The Rules of Defeat: The Impact of Aerial Rules of Engagement on USAF Operations in North Vietnam, 1965-1968* (Maxwell Air Force Base, Alabama: Air University Press, 1992), 21.

⁶ Clodfelter, *The Limits of Air Power*, 137-8.

⁷ Clodfelter, *The Limits of Air Power*, 140.

⁸ Drake, *The Rules of Defeat*, 21-2.

Northern leaders were able to use the bombing to harden the support of the population for the war in the South. The firm resolve of the North Vietnamese people was a crucial component for continuing the support for the VC in South Vietnam.⁹ Therefore, the firm will of the leaders of North Vietnam and their people limited the effect Rolling Thunder could have on morale. Rather than hurt morale, the bombing campaign hardened the North's determination to continue the war.

Political constraints placed on Operation Rolling Thunder, precisely the control of targets and frequency of attacks, limited the effects of the bombing campaign. President Lyndon Johnson's political controls on Rolling Thunder sought to prevent Soviet or Chinese intervention. Therefore, the USAF was restricted from hitting targets close to the Chinese border or Hanoi and Haiphong unless permitted by the Joint Chief of Staff. These restrictions remained in effect throughout the duration of Rolling Thunder. Furthermore, restrictions were placed on how often strikes could be initiated. Targets were assigned weekly and biweekly to ensure that the campaign would gradually intensify. In many cases, Johnson would halt the campaign completely for both propaganda reasons and negotiations.¹⁰ The USAF could have destroyed all high-value air defence targets early in the war. However, due to political limitations, they were constrained. This allowed the North Vietnamese to expand their air defence system without interference until 1966. The political restraint imposed on the Air Force during Rolling Thunder ensured that gaining complete control of the sky was impossible.¹¹

The air defence system created by North Vietnam with the help of the USSR was an issue for the USAF bombers and complicated the quest for air superiority. With the help of the Soviet

⁹ Clodfelter, *The Limits of Air Power*, 138.

¹⁰ Clodfelter, *The Limits of Air Power*, 119.

¹¹ Brian D. Laslie, *The Air Force Way of War U.S. Tactics and Training after Vietnam* (Lexington, Kentucky: University Press of Kentucky, 2015), 5.

Union, the North Vietnamese were able to construct an air defence system.¹² This air defence system included a combination of Surface-to-Air Missile (SAM), radar, Anti-Aircraft Artillery (AAA), and MiG's. The North had an extensive and effective radar system that was good at detecting American aircraft and coordinating MiG, SAM, and AAA engagements. With so many radars, the Air Force could not jam them all, resulting in untroubled aircraft detection. By 1966, the North Vietnamese AAA defences were alarming for the USAF, estimated at 7,000 guns nationwide. Specifically, the AAAs were heavily concentrated around Hanoi and Haiphong and were comparable to those in WWII around vital industrial areas. As a result, loss rates for attack sorties from 1965-68 were roughly four percent, a significant issue for the Air Force. SAM sites proliferated following 1965 as a response to the increasing American air war. In 1965, North Vietnam fired 180 SAMs, which destroyed eleven American aircraft.¹³

The approach of gradualism taken by Johnson hampered the surprise, flexibility, and concentration of the aerial attacks. Since targets were progressively attacked in Rolling Thunder, the campaign's surprise element was limited. The North Vietnamese quickly realized that the USAF was only targeting specific areas and that these targets expanded slowly as they refused to bend to the Americans. This allowed Hanoi to concentrate its air defences in areas they knew would be attacked. The gradualist approach limited flexibility because of the regimental targeting plan, which forbade improvisation or alterations. Consequently, the Air Force was allowed no room for ingenuity during Operation Rolling Thunder. Lastly, the USAF could not concentrate its forces during the bombing campaign. This resulted from fragmented command

¹² Mark Clapson, *The Blitz Companion: Aerial Warfare, Civilians and the City since 1911* (London: University of Westminster Press, 2019), 157.

¹³ William W. Momyer, *Airpower in Three Wars* (Maxwell Air Force Base, Alabama: Air University Press, 2003), 133-4, 136-7.

and control combined with numerous bombing halts.¹⁴ The approach of gradualism coming out of political restraints created significant hurdles for the Air Force to achieve their ultimate objective. The restraints imposed on the USAF during Rolling Thunder ensured that the campaign lacked ingenuity, flexibility, and concentration while allowing Hanoi's air defence system to grow.

The environmental conditions of North Vietnam were a further limitation to the success of Operation Rolling Thunder. North Vietnam is covered with dense vegetation and forests, which allowed for coverage of men and supplies moving into the South. This greatly limited American airmen's ability to locate transportation vehicles in interdiction efforts. The weather in Vietnam was a further environmental limitation to aerial campaigns, specifically during the monsoon season, which arrived in August.¹⁵ This lasted for eight months of the year, covering North Vietnam in rain and fog. With reduced visibility, the accuracy of bombing in Rolling Thunder during these months was erratic. In lousy weather, bombs typically fell 1,500 to 2,000 feet from the target compared to the 400-foot dispersion in good weather. Bombings in bad weather were even more inaccurate when targets were defended with anti-aircraft fire. Naturally, the most important targets in North Vietnam had more anti-aircraft protection, such as urban centers. This meant that bombing strategically important targets during bad weather was largely ineffective.¹⁶

Throughout the Vietnam War, USAF pilots, specifically tactical fighter pilots, were not adequately trained for the missions required of them. The focus of the training was on the needs

¹⁴ Stephen W. Wilson, "Taking Clodfelter One Step Further: Mass, Surprise, Concentration, and the Failure of Operation Rolling Thunder," *Air Power History* 48:4 (2001): 43-4.

¹⁵ Phil Haun, *Tactical Air Power and the Vietnam War: Explaining Effectiveness in Modern Air Warfare* 1st ed. (Cambridge: Cambridge University Press, 2024), 44-5.

¹⁶ Earl H. Tilford, *Setup: What the Air Force did in Vietnam and Why* (Washington, DC: Air University Press, 1991), 113-4.

of the bomber force and did not prepare fighters for combat with enemy planes or defeating enemy air defences. Specifically, one of the significant problems facing fighter pilots in missions over North Vietnam was their lack of experience. Pilots who trained with one aircraft type were thrown into a short replacement training unit to fly fighters. However, this training was usually lacking, which was a common complaint among pilots in the USAF. For example, pilots received no basic training in fighter maneuver concepts like ‘barrel roll attack’ and ‘high-speed yo-yo.’ Therefore, pilots were not appropriately trained to employ the full potential of their aircraft, which limited the protection bombers received from fighters during Rolling Thunder. As a result of poor training, the Air Force suffered heavy losses from a country with inferior military capability. In total, the Air Force lost 1,737 aircraft, of which 1,443 were lost to ground fire, and MiGs shot down 67. These losses strained the Air Force’s ability to train and deploy tactical air squadrons. Therefore, training time for pilots was cut from twenty-six weeks to six weeks, which exaggerated training problems.¹⁷ Ultimately, fighter pilots’ poor training made bombers more susceptible to the North’s anti-aircraft defense system.

Operation Rolling Thunder failed to coerce North Vietnam to stop their support for the VC due to the limitations of doctrine, political constraints, environmental conditions, and training. The doctrine employed by the USAF in Rolling Thunder was unsuitable for a guerrilla conflict against an enemy with primitive industry. Therefore, the strategic objective of stopping Hanoi from being able to support the insurgency in the South was unrealistic. Despite the American interdiction efforts, the VC had marginal supply needs that the North could easily fulfill. On the other hand, Hanoi was not reliant on petroleum or energy and could exceed its requirements with Chinese and Soviet support. Political restraints and the gradual approach of

¹⁷ Laslie, *The Air Force Way of War U.S. Tactics and Training after Vietnam*, 2-4, 10-1, 13.

Rolling Thunder limited when and where bombers could attack and allowed the North Vietnamese air defence system to grow. The environment in Vietnam created difficulties for the USAF in finding transportation routes and hitting targets during the monsoon season, which resulted in poor accuracy. Training tactical fighter pilots ensured that pilots did not know the potential of their aircraft, which resulted in increased losses. These difficulties ensured that airpower was misused in Vietnam and that the Air Force was unprepared for the challenge they faced in Operation Rolling Thunder.

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