



*B-29s head out from Guam on a mission against Japanese industrial targets. B-29s dropped 91 percent of all bombs falling on Japan during World War II.*

**The Strategic Bombing Survey authoritatively determined that the B-29 campaign played a decisive role in Japan's surrender.**

# How Bombers Defeated Japan

By Phillip S. Meilinger

**A**merican war plans prior to World War II anticipated a Europe-first strategy. After Pearl Harbor, however, the public demanded action against Japan. As the Army and Navy geared up for campaigns in the Pacific, the US Army Air Forces (AAF) examined ways to hit Japan. B-17s and B-24s did not have range to reach the Japanese home islands, so the AAF needed a bomber with a range greater than 3,000 miles.

The bomber would turn out to be the Boeing B-29 Superfortress.

The first B-29s of XX Bomber Command, a subunit of Twentieth Air Force, were deployed to India in April 1944 under the command of Brig. Gen. Kenneth B. Wolfe. However, logistical problems arose as all supplies had to come over the Himalayas. While flying over "The Hump" was a terrific aerial feat, this requirement added to the difficulties of XX Bomber Command, and bomber operations proceeded slowly.

Gen. Henry H. "Hap" Arnold, the ever impatient AAF Chief, relieved Wolfe in July 1944 and replaced him with Maj. Gen. Curtis E. LeMay. Although performance improved, the problem with the attacks on Japan was in the concept of striking from India. Attempting to operate a successful strategic bombing campaign over such vast distances in a remote theater was simply unrealistic.

The tale is told in the tally: In the 49 combat missions flown by the XX Bomber Command, over nearly 10 months, only 11,000 tons of bombs were dropped—compared to 156,000 tons that would be dropped by XXI Bomber Command from the Marianas. Operations from India were halted in March 1945.

On the upside, some bugs were worked out of the new aircraft, the campaign bolstered Chinese morale, and LeMay gained valuable Pacific and B-29 experience. The Marianas bases were essential for the strategic air campaign against Japan, and it was from the islands of Guam, Saipan, and Tinian that the B-29s would strike major blows.

Targeting has always been a key component of strategic air warfare. So even before the B-29s were deployed, there was a major effort to study the Japanese economy and select the most appropriate targets.

Unfortunately, the intelligence apparatus required to conduct such a study and provide competent targeting advice was limited and faulty. The AAF entered the war deficient in this area, and Japan was a difficult intelligence challenge due to

the closed nature of its society. In many cases, the air planners had to rely on old maps, an occasional tourist report, and prewar insurance data.

Building upon the lessons and experiences of the European theater, air planners identified several key systems in Japan to be targeted. Coke ovens, essential for steel production, were a key system singled out for attack. Other target systems included merchant shipping, oil refineries, the transportation network, and munitions factories, especially aircraft and engine complexes.

### **A Radically Different Tactic**

US Strategic Bombing Survey (USSBS) analysts reinforced these targeting priorities after studying the effects of Allied bombing on Germany.

The commander in the Marianas would have other ideas, however.

The first three months of the XXI Bomber Command's operations based out of the Marianas were not impressive. By January 1945, XXI had dropped a mere 1,500 tons of bombs on Japan. Accuracy was poor, and on half the missions only one out of 50 bombs fell within 1,000 feet of the target. Once again, Arnold ran out of patience.

LeMay was moved from India to Guam to take command in January 1945. He soon lowered bombing altitude by several thousand feet to improve range and decrease the effects of the jet stream at high altitude, which played havoc with accuracy. Intelligence was still an imprecise science, but analysts determined the Japanese economy was organized into "cottage industries," unlike the large factory complexes prevalent in Europe. Half of all workers in Tokyo were employed in factories of less than 100 people.

As a result of these factors, in March 1945 LeMay made a radical change. He lowered the bombing altitude to below 9,000 feet. Because he suspected weak night defenses, he stripped the B-29s of guns, ammunition, and gunners, except for the tail gun.

In a stunning reversal of two decades of air doctrine, LeMay jettisoned the teachings of the Air Corps Tactical School that emphasized high-altitude, daylight precision bombing and ignored most of what he and other combat leaders had learned so painfully over Germany. He launched his B-29s at night in low-altitude area bombing attacks, using incendiaries against Japanese cities.

This was risky, but it worked. The Japanese were unprepared for firebombing, and the results were devastating to the Japanese economy and its military capability. The combination of lower altitude and reduced defensive armament allowed for doubling the airplane's bomb load to six tons.

In July 1945, Eighth Air Force, newly outfitted with B-29s, arrived in theater under the command of Lt. Gen. Jimmy Doolittle. The Eighth was just gearing up in the Pacific when the war ended, but the bombing already had reached a crescendo. B-29s dropped 14,000 tons in March (with 385 aircraft available), and then 43,000 tons in July (with nearly 900 aircraft on hand). Planners anticipated this figure would rise to an astonishing 115,000 tons in September with the combined might of the Eighth and Twentieth Air Forces in full operation.

But before that could happen, on Aug. 6, 1945, a B-29 dropped an atomic bomb on Hiroshima. Three days later, a second atomic bomb hit Nagasaki. After the second bomb, the emperor broke a three-to-three tie at a Cabinet meeting and sued



*B-29s sweep low over the Marianas as a US Navy construction battalion (Seabees) builds a base. XXI Bomber Command would drop 156,000 tons of bombs operating from the chain of tiny islands.*



**Gen. Curtis LeMay radically changed bombing strategies from high-altitude, daylight raids to nighttime, low-altitude raids using incendiaries.**

for peace. What had finally pushed Japan into surrendering?

In his unprecedented radio address to the nation on Aug. 15, the emperor justified surrender by referring to a “most cruel bomb” whose power was “incalculable.” USSBS members, who had deployed to Japan under survey chief Franklin D’Olier shortly after the surrender, interviewed Japanese leaders to find out what brought about capitulation.

The chief cabinet secretary, Hisatsune Sakomizu, said, “The chance had come to end the war. It was not necessary to blame the military side, the manufacturing people, or anyone else—just the atomic bomb. It was a good excuse.”

Kantaro Suzuki, the premier, confirmed this, but stated he needed the right circumstances to overcome the intransigence of the military leaders, and the atomic strikes gave him that opportunity.

The atomic bomb drops continued to cause controversy, and the USSBS added to this debate by asserting that Japan would have surrendered by Nov. 1 without the use of atomic bombs, without an invasion, and without Russia entering the war—implying the bombs were unnecessary.

But the survey’s prediction of a Japanese surrender by November was based on the assumption that the crescendo of bombing just noted would soon begin. With the arrival of Eighth Air Force on Okinawa, the tonnage of bombs dropped on Japan was scheduled to nearly triple beginning in September. The devastation to Japan would have been different, but enormous nonetheless.

What if there had been no bombing at all and no invasion? Would the US Navy’s blockade have been more humane? The

survey revealed that rationing started in 1941, and by 1945, the food situation was “critical.” But how long would a starvation blockade have lasted and how many civilians would have died before the military leaders gave in?

During the war, the Japanese held 558,000 prisoners of war and internees in prison camps. The mortality rate in these camps was around 40 percent—10 times that of the German camps. And millions of Asians under Japanese domination would have continued to suffer under occupation until a blockade played itself out.

Similar to what was done in Europe, the bombing survey conducted an analysis of the Japanese economy and its destruction by the bombing campaign, with interviews, site visits, photographs, and tons of data collected.

The directors would publish 108 reports for the Pacific, some controversial.

### Psychological Warfare

The statistics collected by the USSBS teams were illuminating. The B-29s dropped 91 percent of all bombs falling on Japan, and 96 percent of all tonnage fell in the last five months of the war. Air attacks destroyed hundreds of factories and thousands of “feeder industrial units.”

The Japanese attempted to disperse into underground factories and caves to avert the attacks, but this effort only further dissipated scarce resources. Japanese industrial production dropped between November 1944 and July 1945. In the cities not bombed, production in June 1945 was at 94 percent of its wartime peak, but in bombed cities, production fell to 27 percent of its acme. By July 1945 aluminum production was at nine percent, while oil refining and ingot steel production were at 15 percent of their high points.

The survey concluded that “by July 1945, Japan’s economic system had been shattered. Production of civilian goods was below the level of subsistence. Munitions output had been curtailed to less than half the wartime peak, a level that could not support sustained military operations against our opposing forces. The economic basis of Japanese resistance had been destroyed.”

Eight-and-a-half million people evacuated Japanese cities. This was a quarter of the urban population, although in big cities such as Osaka

and Kobe, more than half fled. One-third of the 8.5 million evacuees were factory workers, evidenced by an absentee rate of 49 percent by the end of the war.

This trend was spurred by LeMay, who in July began dropping leaflets on Japanese cities, stating they would be bombed in the next few days. One Japanese official said these leaflet drops caused panic and contributed to the evacuation of the cities. Of those remaining, hundreds of thousands of people were pressed into service to fight fires, restore utilities, and clear rubble after bombing missions, which further hindered production and attempts to disperse the armaments industry.

Morale plummeted. Polls taken by survey teams indicated that in June 1944, only two percent of the Japanese population thought they would lose the war. By December, it was 10 percent; in June 1945 it was 46 percent; and by August it had climbed to 68 percent.

As for reasons for surrender, more than 50 percent said it was due to air strikes and some 30 percent blamed it on military losses.

The Navy had played a supporting role in the defeat of Germany, but felt it had enjoyed a dominant role in the Pacific. The Navy therefore insisted on writing a series of reports detailing the history of naval operations in the theater, including amphibious operations in the South Pacific and central Pacific areas. For the Navy, these operations were essential preludes to the bomber offensive beginning in November 1944 from the Marianas. Clearly, it was looking ahead to peacetime, when the major issue of a separate Air Force would be decided.

As in Europe, there were synergies in the industrial collapse, and the Navy’s unrestricted submarine warfare campaign was important in reducing the

***These leaflets were dropped on 35 Japanese cities, including Hiroshima and Nagasaki, on Aug. 1, 1945. On the reverse side, written in Japanese, was a warning for civilians in these possible target cities.***



supply of raw materials to the home islands. B-29 air bases were won by the combined efforts of the Army, Navy, and AAF. The bombers then struck Japanese aircraft factories, but these factories were already low on aluminum supplies due to the blockade. However, even when aircraft were built, there were no engines to power them because bombing had destroyed the power plant factories. Even if engines had been available, there was no petroleum to fuel them because of the blockade. If there had been petroleum, oil refineries had been destroyed from the air—limiting gasoline production. The Navy's strangulation blockade was greatly assisted by the B-29 campaign that mined inland waterways and plastered Japanese airfields where kamikaze pilots took off.

The Japanese food situation was also precarious. As the war progressed, more and more farmers had to leave the land to fight or to work in the factories, thus causing food shortages. Submarines cut sea lines, and aerial mines sown by B-29s lowered imports. The bombing of factories cut fertilizer production, reducing crop yields. The need to rebuild bombed factories pulled more farmers off the land, and by the end of the war, more than one million acres of arable land were abandoned. There were many such examples that demonstrated a vicious and ever tightening downward spiral from which Japan could not recover. Japanese leaders were presented with multiple catastrophic failures they could not handle; one or two of the above might be managed, but not all of them.

Overall, at least 330,000 Japanese civilians were killed by the air attacks, about the same total as in Germany, although the losses occurred in much less time and with only one-tenth the tonnage. In addition, about 2.5 million homes were destroyed in the air attacks, and more than 600,000 others were pulled down by the government to build firebreaks.

The air campaign was not, however, a total success. The biggest strategic error made by the planners, according to the survey, was that B-29s should have struck railroads and inland waterways sooner. Such attacks would have thoroughly disrupted internal transportation, as well as significantly curtailed reinforcements to the island of Kyushu—the site of the proposed invasion in November 1945.

The B-29s played a decisive role in the defeat of Japan. Aerial bombardment reinforced the naval blockade that disrupted the economy of the country as a whole, but primarily it made ultimate victory seem



***B-29s fly over USS Missouri during the surrender ceremony aboard the battleship in Tokyo Bay on Sept. 2, 1945. If not for the bombers, Japan could have held out for months longer against the naval blockade.***

utterly hopeless to the Japanese and their leaders. No doubt Japan could have gone on for months—perhaps years—if the only threats were the starvation blockade and the slow but inexorable creep of Allied armies toward the home islands.

As Premier Suzuki phrased it, “Merely on the basis of the B-29s alone I was convinced that Japan should sue for peace.” More specifically, the psychological effect of the atomic bombs created a climate within the Japanese leadership allowing the emperor to overrule his hard-line military advisors.

The overwhelming authority of the USSBS is unassailable. Nothing like it has ever been attempted after a war. The mountain of evidence obtained, the

thousands of interviews conducted, the painstaking measurements taken, are simply too massive to refute.

More importantly, the USSBS provided airmen in the immediate postwar years the unimpeachable evidence they needed to carry on the fight for institutional independence. The survey's reports, and especially the concise and readily obtainable summary volumes, were widely circulated and quoted in the years to follow.

There is still much to be gained from these documents. For airmen today, the hundreds of detailed surveys still provide a rich and deeply authoritative mother lode of information regarding the effectiveness of the AAF's World War II bombing effort. ■

*Phillip S. Meilinger is a retired Air Force pilot with 30 years of service and a doctorate in military history from the University of Michigan. He is the author of eight books and more than 80 articles on military affairs. His latest book is Into the Sun: Novels of the US Air Force. His most recent article for Air Force Magazine, “The USSBS' Eye on Europe,” appeared in October.*