

# Recalling the H-Bomb that Almost Backfired

Yang Guoxiang, one of China's top test pilots, tells the story.

**Bob Bergin**

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Courtesy Yang Guoxiang

*When your assignment is to drop a live nuclear bomb, you'd better not return to base with it. But that's just what happened in 1971 to Yang Guoxiang, a pilot with the People's Liberation Army Air Force, who told his harrowing tale to Bob Bergin, a former U.S. Foreign Service officer who writes about the aviation history of Southeast Asia and China. Bergin interviewed Yang in Kunming, China, in early 2009, with the assistance of interpreter Zhao Gang, an instructor at Yunnan University.*

***Air & Space:* You hail from the remote mountains of Yunnan Province. How did you come to be a pilot?**

**Yang:** China was at war with the invading Japanese as I was growing up and trying to get an education. In middle school I came in contact with the underground Communist Party and joined a communist youth group. In November 1948, I participated in an armed uprising against the Kuomintang (KMT) government and had to flee into the mountains, where I became a guerrilla. In 1949 I formally joined the PLA.

In 1949 the People's Republic of China was founded. The People's Liberation Army Air Force (PLAAF) was established the same year. We had few pilots, so the PLAAF set up aviation schools to train them. The start of the Korean War in 1950 accelerated the process. I was serving in Yunnan and was one of 1,000 who signed up to join the air force. Six candidates were chosen, and I was the only one remaining after we six were sent to Kunming for health checks.

I was sent to Beijing in February 1950, and from there to the aviation school at Mudanjiang. Most of our instructors were former Japanese POWs who had volunteered to help the PLAAF after the war, and former KMT who had joined us. Our aircraft were Japanese and American types that remained from the war. Our training lasted just three months before we were sent to operational units. I had 70 flight hours, and was sent to fly ground attack aircraft, the Russian Ilyushin IL-10, a version of the famous IL-2 "Sturmovik" of World War II, the "Flying Tank." I was assigned first to the 22nd Division, and later to the 11th Division, which participated in the Korean war.

We were sent to northeast China and were ready to deploy across the border into Korea when American F-84s destroyed the airport we were to use, and so we did not go. We became witnesses to the Korean War. From our base in China, we could see F-86s in the sky, and knew most of the American pilots had thousands of flying hours, while we had only a few. In terms of experience, we were children. Our only asset was our courage.

After the Korean War we modified the MiG-15 to make it suitable for ground attack. Many of the aircraft the Soviets had given us were abandoned because of the short life of their engines. When Sino-Soviet relations deteriorated in 1958, China decided to develop its own ground attack aircraft.

We were short of aircraft then, and short of fuel. Most of our airplanes stayed on the tarmac for lack of fuel and spare parts. Our pilots could fly only about 40 hours a year, and the recruitment of new pilots was suspended for several years.

**A & S: Describe your role in the development of China's Qiang-5 aircraft.**

**Yang:** It would take years of arduous work, but China would develop its first military aircraft, a supersonic ground attack plane designated the Qiang-5, or Q-5. The chief designer was a former KMT officer, Lu Xiaopeng, who had studied aircraft design in the U.S., but stayed on the mainland after the KMT evacuated to Taiwan. He used the Russian MiG-19 as his model, and adapted its features to create a ground attack aircraft with much greater range than the MiG, but with many changes to the original design. The completed airplane was similar to the American F-4 Phantom.

In 1965 I was one of four pilots chosen to participate in the Q-5 flight tests. I had never flown a supersonic aircraft. To make the transition to the Q-5, I was sent to fly the MiG-19 and then the upgraded MiG-19 attack version. Finally, I was sent to Tangshan city to fly the Q-5. In 1966 and 1967, I made over 200 flights in the aircraft. At the end I prepared a report on the Q-5's strong points and flaws.

In 1967, a meeting was held in Beijing to discuss the feasibility of producing the Q-5. The meeting was the key to implementing the program, and I was asked to speak. I cited the issues that I had covered in my written report, including the Q-5's problems, such as its controls. They were hydraulically activated and responded very slowly to inputs. Hydraulic pressure was too low. That also made it difficult to retract the undercarriage when the airspeed reached 330 kilometers per hour (205 mph).

The meeting led to the production of the Q-5. Despite the turmoil caused by the Cultural Revolution then underway, the CPC Central Committee decided to produce 250 Q-5s. I was appointed Director of the Q-5 test flight panel, and named as Director of the Air Force Scientific Research and Development Department.

Despite our best efforts, the Q-5 program lagged well behind our hopes. It was 1969 before the Q-5 passed all its tests. After I made the last flight in December of that year, the Q-5 was declared operational, and the plant was given formal approval to go into full production. My work with this project was completed. I was named commander of an operational unit, the 19th Division in Shandong.

While we were still in test flight stage, the Director of the Nuclear Weapon Research Institute had talked with me and I started to sense that the Q-5 might be included in some strategic program. He asked about aircraft that could carry a big bomb, like the H-bomb, which was much bigger than any other bomb we had. I told him it might be possible to use the Q-5.

Later, when Zhou Enlai asked about aircraft appropriate for an H-bomb mission, the Air Force Engineering director recommended the Q-5. That led to the question of a pilot qualified to fly the mission. In a regular bomber like the Tu-22, there was a crew of six, but on the Q-5 there was only one man. He would have to be a highly skilled pilot, totally familiar with the Q-5, and politically acceptable. The Nuclear Weapons Research Institute later requested that I be named as pilot for the mission. At the end of April 1970, I was told that I would drop the H-bomb.

### **A & S: Can you discuss the logistics of this mission?**

**Yang:** I met with the Director of the Nuclear Weapon Research Institute to discuss the Q-5's capability. The Q-5 had limited space inside its fuselage for weapons. The H-bomb was two meters (6.5 feet) long and weighed a ton. We discussed the problem for three days, and in the end decided the bomb could be carried externally, slung under the fuselage, in a semi-recessed bay, on a mounting that was like two hooks. Later we added a device that would push the bomb out so that it could not collide with the aircraft when it was released. This variant of the Q-5 modified to carry a thermonuclear hydrogen or H-bomb was designated the Q-5A. We believed the bomb could be dropped by the end of 1970.

The bomb would not literally be dropped, but "tossed" at the target. The technique we used was to approach the target at an altitude of 300 meters (984 feet) to stay below the capability of most radars of the time, and at a speed of 900 kilometers an hour (560 mph). When the aircraft was twelve kilometers (7.5 miles) from the target, we would start a climb at an angle of forty-five degrees. At precisely an altitude of 1200 meters (3,936 feet), I would release the bomb.

After the bomb separated from the aircraft, it would continue to climb to 3,000 meters (9,840 feet) and then start down. As the bomb climbed, it sped toward the target twelve kilometers (7.5 miles) away. It would take the bomb sixty seconds to reach the target and explode right above it. Meanwhile, as soon as the airplane released the bomb, it reversed course to get well away from the area of the blast.

Our target zone was 200 meters (656 feet) in diameter, which I could usually strike. Once in about ten times I could hit within 50 meters (164 feet) of the center. We had practice bombs that replicated the size and weight of the actual H-bomb, but made of steel and cement. I dropped practice bombs 200 times.

Then, in late 1970, we had a problem with the H-bomb itself. During a test at the Lop Nor test site, the bomb exploded, but the expected atomic reaction did not occur. The H-bomb had failed; the cause would have to be investigated. My work preparing for the Q-5A for the mission came to a halt. I returned to my unit in Shandong.

The next year, in September 1971, a political event occurred that eventually determined the timing of the H-bomb project. Vice Premier Lin Biao was killed in an airplane crash while trying to flee to the Soviet Union after a failed coup attempt. There had been an upheaval in the PLA, and to raise morale, Chairman Mao Zedong decided that we would drop the H-bomb that year.

The date of the mission was kept secret. Once the date was chosen, and Chairman Mao concurred, all of the personnel at the nuclear site were restricted to base.

The director of the nuclear weapons institute took me aside and privately briefed me on what I could expect when the bomb exploded. He assured me that I would not be in any danger. Because of that and the many practice missions I had flown, I did not feel any differently when I carried the live bomb.

**A & S: And on the day of the actual flight?**

**Yang:** On December 30, 1971, weather conditions were good. I took off from the airbase in the late morning and headed toward the target, ground zero at Lop Nor, three hundred kilometers (186 miles) away. I flew at 900 kilometers an hour (559 mph) and an altitude of 300 meters (984 feet), following the procedures we had established. Twelve kilometers (7.5 miles) from the target, I started my 45-degree-angle climb, and exactly at 1,200 meters (3,936 feet) released the bomb.

Nothing happened! The bomb did not separate from the aircraft. The indicators on the panel showed that it was still attached. I turned back toward the target and prepared to do everything again a second time.

We had planned for emergencies. There were three separate release mechanisms, mechanical links to the bomb shackle, of which two were backups in case the first one failed. I tried all three; none worked.

On my second approach I followed the same procedures, and again the bomb failed to release. I turned to try again. I made a third approach, and for the third time the bomb would not release. The situation was now critical. I was running short of fuel.

Before taking off, I had reviewed our emergency procedures. I had three choices: I could abandon the aircraft by parachute and let it crash in a remote area of the vast desert that surrounded the Lop Nor Test site. I could crash-land the aircraft to assure that it was set down in place where it would harm no one. Or I could try to bring the aircraft back to base. I reflected on the time and the effort that went into the H-bomb project, and the great deal of money it cost the Chinese people, and I made my choice. I would try to bring the airplane and the H-bomb back to base.

There was a great risk in doing this. There were 10,000 people on the airbase, although only a few knew about the mission I was on. If anything went wrong, thousands would lose their lives. The bomb under the fuselage would be hanging just ten centimeters (four inches) above the ground as I landed.

All radio stations in northwest China had been shut down during my flight, and all flights in the area were banned. I radioed the tower of my decision to return, and asked that everyone on the base be evacuated into the tunnels that were dug underneath the base. It was Zhou Enlai himself who gave the order to evacuate.

**A & S: Was there a possibility that the bomb could explode if it contacted the runway on landing?**

**Yang:** There were five “safeties” that had to be deactivated to enable the bomb to explode. When the bomb was mounted to the airplane, the first safety was released. Fifteen minutes after the aircraft took off, the second safety was released; the third when the aircraft reached the target zone. When the pilot decided to drop the bomb, he released the fourth. The fifth and final safety released automatically sixty seconds after the bomb was dropped, an instant before it exploded.

No one could be sure whether or not the bomb would explode if it touched the runway, but I was confident that I could set the airplane down gently. So I landed with the H-bomb hanging under me. It was a perfect landing. When I shut down the engine, there was total silence; I was completely alone. The airfield was deserted. All 10,000 personnel were sitting in tunnels under the ground. I could not leave the cockpit: there was no ladder for me to climb down from the fuselage that was high above the ground.

I called the tower and asked for help. The tower told me to work my way back to the tail and jump. The people in the control tower were angry; in their eyes I had put 10,000 lives at risk,

And I had caused a big mess. When I notified the tower that I was returning with the bomb, the evacuation siren went off. It was lunchtime at the airbase; everyone was sitting down and eating. They had to rush out, put on gas masks and scramble into the tunnels. A big rice cooker caught fire because there was no one left to take care of the kitchen. Everyone there then still remembers my name: I could have brought them their Judgment Day.

It took a long time for anyone to come near my aircraft. Our procedures for dealing with the H-bomb meant we had to wear rubber shoes and clothing that would not create static electricity. No metal was allowed in the area of the bomb. In the nuclear weapons storage bunker, all steel columns were wrapped in copper. Now that I had unexpectedly brought the H-bomb back, there were no service vehicles equipped with the required shielding. I sat out on the field for a long while.

### **A & S: What had caused the hang-up?**

**Yang:** We sent the release devices to Beijing for analysis. It was determined that one reason the shackle malfunctioned was that the mechanism was carefully kept in a heated area until just before it was mounted on the aircraft. This was not the usual procedure, but as this was the first release of a live bomb, everyone was being especially careful. When the aircraft took into the cold air, it was possible that

the sudden temperature change affected the tolerances on parts of the mechanism that caused its failure to release. The shackles and release mechanism were modified so this could not happen again.

**A & S: So you were not concerned on your second attempt?**

**Yang:** The decision was to go again on January 7, 1972. Wind conditions were optimal. Weather at the Lop Nor site was good, but there was a cold front moving in. It was snowing at the airbase when I took off.

This time there was no problem. I followed procedures, and when I released the bomb, it separated from the aircraft as it was supposed to. As soon as the bomb was gone, I reversed course to get far away from the blast zone and activated shields that would protect me in the cockpit. Then I saw the flash, a very big flash. The bomb exploded in the air, at a pre-determined height above the ground. I felt the shockwave—it rocked me like a small boat in the ocean—and then I saw the mushroom cloud rising up into sky. By that time I was already 20 kilometers (12.4 miles) away from ground zero.

Watching the mushroom cloud from the air, I could see how different layers of clouds inside the mushroom were connected to one another, just like smoke from a chimney. At that moment I felt very happy. The test had been successful! And then I had to face my new concern: how to land safely on a runway covered in snow.

After I landed, I found little excitement at the airbase. Because of the heavy snow, no one there saw anything, not the great flash of light, nor the mushroom cloud that the people near ground zero saw.

At a ceremony celebrating the project's success, I was cited for my contribution to China's nuclear development. Zhou Enlai had said that bringing the bomb safely back after the first attempt was a miracle. At that time everything was top secret. My name was kept secret for another two decades, until I was formally acknowledged in 1999, at a conference commemorating the 50th anniversary of "Two Bombs and One Satellite," meaning the A-bomb, the H-bomb, and an artificial satellite, the most important projects undertaken by the PLA after the founding of the People's Republic of China.

*Yang continued to fly the Q-5 until he retired at age 50. He moved back to Yunnan Province, and now lives in the provincial capital at Kunming. The Q-5A in which Yang flew the H-bomb tests, Number 11264, is on display at China's National Air Museum*



*near Beijing. Many other Q-5s continue to serve with the PLAAF, 40 years after its introduction.*