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ACCIDENT REPORT OF B52G NEAR SEYMOUR JOHNSON AIR FORCE BASE NORTH CAROLINA

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H. D. Bickelman, 7162-1

February 1961

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Approved by E. H. Draper Jr.
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ABSTRACT

On January 24 through January 31, 1961, a trip was made to Goldsboro, North Carolina, to collect information regarding the nuclear weapon safety hazards in connection with the crash of a B52G aircraft of the SAC airborne alert force. The aircraft was carrying two Mk 39 Mod 2 weapons. There were no detonations of either of the weapons; no radiological safety hazards resulted from the accident. All procedures as outlined in appropriate Air Force manuals for ensuring that weapons of this type are rendered safe were followed by the EOD team on the site.

The two weapons were separated from the aircraft as a result of aircraft breakup; on one weapon the parachute deployed; the other fell in a free-fall trajectory. The safety features of both bombs behaved in a normal manner. No hazard from the weapons resulted. The public relations throughout this incident were handled by the Air Force in a highly competent manner.

THIS DOCUMENT CONTAINS 8 PAGES
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ACCIDENT REPORT OF B52G AIRCRAFT CRASH NEAR SEYMOUR JOHNSON AIR FORCE BASE, NORTH CAROLINA

Introduction

At approximately 12:30 am, EST, the morning of January 24, 1961, a B52G aircraft carrying two Mk 39 Mod 2 weapons crashed near Seymour Johnson AFB, North Carolina. The aircraft was stationed at Seymour Johnson and was on a SAC airborne alert mission over the Atlantic Ocean and the East Coast of the United States. During a refueling operation over the Atlantic, the airmen in the tanker plane advised the Commander of the B52 that he had a fuel leak in his right wing and that the tanker plane was separating from the B52. The B52 pilot immediately contacted Seymour Johnson, reported the fuel leak and that he had complete control of the plane, and requested instructions from Seymour Johnson. He was advised at that time to fly over the ocean and burn up his excess fuel. While in the act of burning up the excess fuel in the aircraft, the hole in the right wing apparently became a major rupture; and it is reported that the aircraft lost 37,000 pounds of fuel in a two-minute time period. Following this action, the aircraft commander still had complete control of the airplane and was instructed by Seymour Johnson to come in over the land and prepare to make a landing. Normal procedure in this situation is for the aircraft to do a simulated landing at approximately 10,000 feet to assure that the aircraft commander has control of the plane. The pilot was making his "stabilization run" when he lost complete control of the aircraft; the aircraft apparently lost a wing or a portion of a wing. The air crew was ordered to bail out, and five of the eight members aboard did get out alive. The other three members were killed. The crew members reported that both Mk 39 Mod 2 weapons were still aboard the aircraft and all the switches were in the normal (Safe) position when they bailed out. Sometime between bail-out of the crew and the crash of the airplane, both Mk 39 weapons were separated from the aircraft. The wreckage of the aircraft was strewn along the flight path for a distance of approximately one and a half miles.

Investigation Parties and Activity

A group left Kirtland Air Force Base at approximately 8:30 am, MST, the morning of January 24, 1961, via C-47 aircraft, to advise on matters of nuclear safety. The group consisted of two teams: Team 1, representing the Directorate of Nuclear Safety Research (DNSR), consisted of Col. Charles Malitz, Lt. Col. Francis Smith, Lt. Col. Ernest Stuart, and Capt. Barry O'Grady. In addition, Capt. George Martin from AFSWC was in the party. Team 2, representing the AEC, was made up of Mr. Ross Speer, ALO, Mr. Theodore Scolman and Mr. David Smith from Los Alamos, and Mr. H. D. Bickelman, Sandia Corporation. These teams arrived at Seymour Johnson Air Force Base at approximately 10:15 pm, EST, the night of January 24, 1961. Upon arrival at Seymour Johnson, Col. Malitz reported to Col. O. V. Jones, Commander of the 4241st Strategic Wing at Seymour Johnson, and to Brig. Gen. A. H. Moore, Commander of the Fourth TAC Wing at Seymour Johnson. Already on the scene were Lt. Gen. Sweeney, Commander of the Eighth Air Force from Westover Air Force Base, and Col. John Kline, Chief of the Disaster Control Team for Eighth Air Force, and Gen. Sweeney's personal representative. Col. Kline remained on the scene throughout the investigation. EOD personnel on the scene included the EOD officer of the 53rd Munition Maintenance Squadron (MMS) at Seymour Johnson AFB, an EOD team from Wright-Patterson AFB, the EOD officer of the Fourth Tactical Wing at Seymour Johnson AFB, and an EOD officer from Eighth Air Force, Westover AFB, Mass. At the time of the arrival of the teams from the Albuquerque area, no work was taking place at the accident site.

The following morning at approximately 8:15, the teams were briefed by Lt. Col. K. B. King, the safety officer of the 4241st Strategic Wing and Major R. E. Manley, the Commander of the 53rd MMS at Seymour Johnson AFB. In this briefing we were advised that weapon No. 1, serial No. 434909, which was in the after bomb bay of the B52, had been found essentially intact in a vertical position with its nose penetrating some 18 inches of North Carolina sandy soil shortly after the crash. The parachute pack on this weapon had operated successfully and the weapon had been disarmed by the EOD team, disassembled, and returned to the 53rd MMS Inspection and Storage Building. We were also advised at that time that a hole had been found which apparently was caused by the second weapon. The crater was 5 feet deep and approximately 9 feet in diameter. The first

assumption by the people on the site was that there had been a one-point detonation of the HE in the second weapon which caused this crater. The serial number of the second weapon is 359943.

Immediately following this briefing, the members of the teams from the Albuquerque area departed for the crash site and spent the balance of the morning looking over the area, speculating as to whether or not there had been a one-point detonation of weapon No. 2 and, in general, searching out the area looking for any signs that could be of interest to us in our investigations.

A detailed examination of the components in weapon No. 1 was made the afternoon of January 25, 1961 and the morning of January 26, 1961. Weapon No. 2, serial number 359943, was not definitely located until late Friday afternoon of January 27, 1961, and due to working difficulties (weather, surface water in the crater which was restricting the digging operation, and similar occurrences), weapon components were not available for examination until the morning of January 28, 1961.

The personnel from Sandia Corporation, ALO, and Los Alamos Scientific Laboratory remained at the crash site until the morning of Sunday, January 29, 1961. Mr. Speer, ALO, and Mr. Bickelman proceeded to Washington, D. C., and briefed Brig. Gen. A. W. Betts and Col. S. Goldenberg at DMA, and Gen. Loper, Office of the Assistant to the Secretary of Defense for Atomic Energy, on the results of our investigation.

Aircraft Wreckage

A sketch of the area of the aircraft accident, Figure 1, shows that the aircraft had broken into several pieces in the air. The major wing area and the crew compartments were found in an inverted position, severely burned, and completely demolished. Whether this inverted position was the result of one wing-over or a continuous gyrating action, no one is sure. As indicated in the sketch, one portion of the aircraft, the tail section, was found one mile from the location of the wing and crew compartment of the aircraft. Break-up of the aircraft, it was assumed, occurred in the vicinity of 9,000 feet altitude. Those parts of the aircraft which impacted on the ground showed, except for the tail section, signs of severe burning. The rear truck and bomb bay area especially showed signs of a severe fuel fire. This aircraft was equipped with a T-249 Aircraft Monitor and Control Unit and a T-380 Readiness Switch. These were not recovered.

Weapon Wreckage

The B52G carried two Mk 39 Mod 2 weapons. These weapons were being flown on airborne alert under safety rules which have been approved by the Headquarters, United States Air Force, and the AEC. These rules require that the U2 rack lock will be safety sealed in a lock position, the T-249 Aircraft Monitor and Control and T-380 Readiness Switch will be safetied and sealed in the "Off" position, and the safing pins will be installed in the pullout rod assembly.

Weapon No. 1, Serial No. 434909

This was a Mk 39 Mod 2 weapon on which Alts 184, 189, and 190 had been performed. This weapon left the aircraft at an estimated altitude of 9,000 feet. The arming rods were pulled at the time of separation from the aircraft, the weapon parachute deployed in a normal manner, and the weapon impacted in sandy clay soil and penetrated a depth of approximately 18 inches. The weapon was found in a vertical position with the parachute hanging in the adjacent trees. A post-mortem examination of the weapon indicated the following:

1. On the weapon case, the holes through which the safing pins pass were not damaged; therefore, the assumption is that the safing pins were pulled in a comparatively normal longitudinal manner.

2. The arming rods had been pulled.

3. The MC-845 Bisch Generator had been operated.

4. The MC-640 Low Voltage Thermal Battery had fired.

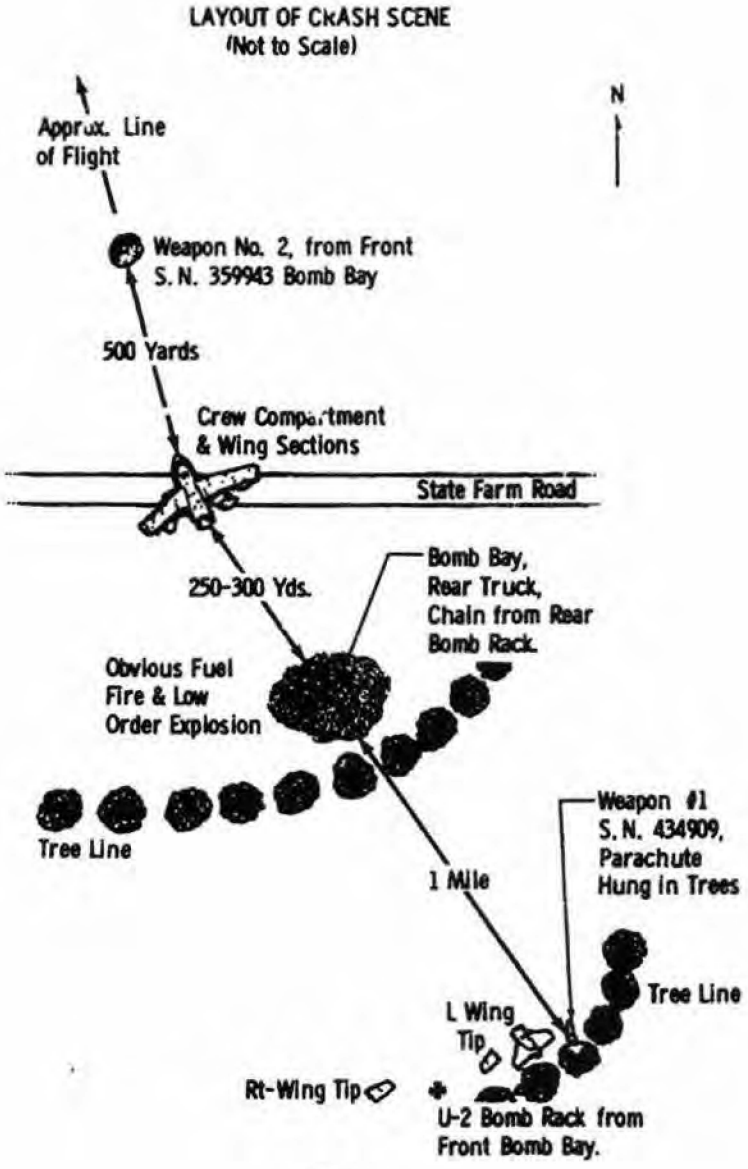
LAYOUT OF CRASH SCENE
(Not to Scale)
Approx. Line of Flight
N
Weapon No. 2, from Front S.N. 359943 Bomb Bay
500 Yards
Crew Compartment & Wing Sections
State Farm Road
250-300 Yds.
Bomb Bay, Rear Truck, Chain from Rear Bomb Rack.
Obvious Fuel Fire & Low Order Explosion
Tree Line
1 Mile
Weapon #1 S.N. 434909, Parachute Hung in Trees
Tree Line
L Wing Tip
Rt-Wing Tip
U-2 Bomb Rack from Front Bomb Bay.

Figure 1

5. The MC-641 High Voltage Thermal Battery had fired.

6. The squibs of the Los Alamos Scientific Laboratory 1A Valve Mechanism on the gas reservoir had not been fired, and the tritium was retained in the reservoir.

7. The MC-543 Timer had been operated and completed its timing cycle.

8. The MC-832 Trajectory Arming Baroswitch showed all the contacts closed.

9. The MC-788 High Voltage Safing Switch was in a "safe" position.

10. The MC-772 Low Voltage Arm/Safe Switch was in a "safe" position.

The appearance here is that the tearing apart of the aircraft removed the safing pins from the Bisch generator arming rods and, from that point onward, the weapon went through a normal sequence of events in which a detonation was prevented by the MC-722 Arm/Safe Switch being in the "safe" position.

In the recovery operation, the EOD personnel performed rendering safe procedures, which called for pinching and cutting the fill tube between the reservoir and the pit of the weapon, and then disassembling the weapon to minimize the effects of any detonation. When we saw this weapon, the reservoir had been removed, the primary had been removed from the weapon case, and these parts were stored in a storage area of the 53rd MMS. The conclusion to be drawn from this weapon is that all of the Sandia components performed as expected in a bomb separated from the aircraft in a safed condition. This unit is being returned by the 53rd MMS squadron to either Medina Base or to Clarksville Base, as directed by the AEC.

Weapon No. 2, Serial No. 359943

This was a Mk 39 Mod 2 weapon on which Alts 184, 189, and 190 had been performed. This weapon separated from the aircraft and did not have normal parachute deployment. The weapon impacted as a free-fall ballistic device in sandy clay and penetrated a minimum depth of 15 to 18 feet (Figure 2). At the time of our return to the Albuquerque area, neither the primary nor the secondary of the weapon had been recovered (the primary was recovered on January 31 at a depth of about 20 feet). However, large portions of the weapon case had been recovered at a depth of about 15 feet. The parachute pack and the fuzing and firing components of the weapon were recovered in the following condition:

1. The parachute had not been deployed. (Information from Strategic Air Command now indicates that the parachute deployment mechanism, the explosive devices, and timers did operate. The reason for the parachute not deploying is unknown at the moment.)

2. The MC-845 Bisch Generator arming rods had been pulled from the weapon.

3. The MC-640 Low Voltage Thermal Battery had been actuated.

4. The MC-543 Timer had run some 12 to 15 seconds and apparently was stopped in its operation at that time by the severe damage suffered at impact.

5. The MC-641 High Voltage Thermal Battery had not fired. This is normal since the MC-543 Timer contacts had not closed. At impact, the unit suffered severe physical damage.

6. The MC-772 Arm/Safe Switch gave a visual indication of ARM; however, a post-mortem conducted on this switch indicated that the switch had undergone severe internal damage, and, in fact, the rotating wafers had been separated from the contacts in the switch. All indications are that the contacts never operated to the ARM position.

7. The squibs in the 1A valve assembly on the reservoir of this weapon had not been fired, and the tritium gas was retained inside the reservoir.

Deleted DOE b(3)

8. The MC-834 Explosive Switch had been actuated and was broken from the MC-543 Timer.

Deleted

DOE
b(3)

The components recovered from this weapon, and in fact the position of these components themselves, indicate that there was not a one-point detonation in this weapon. All of the parts of the weapon were inside the hole which was caused by the ballistic entry of the weapon. The damage to the fuzing and firing components occurred at impact. The U2 bomb rack and release mechanism for this weapon was found in the general vicinity in which the tail section of the aircraft and weapon No. 1 were found. This mechanism was essentially intact; the safing pins in the release mechanism were in place, and a large piece of aircraft material was still attached to one side of the rack.

There is no way of determining how these weapons, or, in fact, when, these weapons left the aircraft. The indication on weapon No. 2, that the timers ran approximately 12 seconds, is that this weapon separated from its rack, or at least that the arming rods were pulled, at an altitude of some 2000 to 3000 feet. This is based on the time required for free ballistic fall. However, the velocity and position of the weapon when the arming rods were pulled is subject to some speculation. The velocity components in either vertical or longitudinal direction are unknown, and therefore a positive statement as to when this weapon left the aircraft cannot be made.

The fact that the safing rods had been pulled from both of these weapons indicates that, during the breakup of the aircraft, the lanyard to the safing pins, which is secured in the pilots' compartment, was pulled due to the forces of aircraft breakup.

The T-249's in B52G aircraft are located in the navigator's compartment, and this is one part of the airplane which suffered severe burning. Some parts of the T-249's were found, but no determination can be made at this time as to their condition. However, a logical assumption, because of the condition of the weapons, is that the T-249's and the T-380 Readiness Switch, were, in fact, in the Safe/Off position.

Security

Security was controlled on the scene of this accident by the personnel from Seymour Johnson AFB, with assistance from the North Carolina State Police. Press releases were made immediately and appeared in the Tuesday evening newspapers in the area. The details of the crash, as far as they were then known, were given, and the fact that the aircraft carried two nuclear weapons was made known. A statement to the fact that the weapons were both safe and that no radiological hazards existed was in the papers. Following some additional human interest stories the second day, the matter was dropped from the local newspapers as no longer newsworthy.

Summary

In the opinion of the writer, the best summarization of this accident is that an aircraft accident under extremely unusual circumstances caused two nuclear weapons, Mk 39 Mod 2, to separate from the aircraft.

One of these weapons underwent a normal release sequence in which the parachute opened and the components of the weapon which were given an opportunity to actuate by the pulling of the Bisch rods did behave in the manner expected. Full operation of this weapon was prevented by the MC-772 Arm/Safe Switch, the primary safing device.

Weapon No. 2, which underwent something other than a normal release from the aircraft, evidenced by the fact that the parachute did not deploy, also had its arming rods extracted, and those components which were given the opportunity to act, did act in the manner expected. Full operation of this weapon was prevented by several things:

1. Impact occurred so soon after separation of the Bisch rods that the timers were not given an opportunity to run down.

2. The Arm/Safe Switch was in the "Safe" condition as the weapon left the aircraft.

There is much valuable information to be gained from this incident, and the post-mortem examinations being conducted at the present time should provide us more technical information in the near future. A separate technical report, including appropriate photographs, will be published when post-mortems are complete and photographs are available.