



STATEMENT BY LT. GENERAL WILLIAM K. MARTIN  
THE INSPECTOR GENERAL, UNITED STATES AIR FORCE  
BEFORE THE ARMED SERVICES COMMITTEE  
HOUSE OF REPRESENTATIVES  
MAY 26, 1965



ACCIDENT AT BIEN HOA AIR BASE,  
VIET NAM

Mr. Chairman - Gentlemen,

I have just returned from Bien Hoa Air Base in South Viet Nam where I investigated the tragic and costly accident which occurred at that base on 16 May. I have briefed the Chief of Staff of the Air Force and the Secretary. Today I will cover the circumstances preceding the explosion, primary areas investigated and our findings.

As soon as the Chief of Staff received word of this accident, he directed me to form a team and depart Washington for Viet Nam, as soon as possible. Within 5 hours, I departed with a team of maintenance and supply, picked up a munitions expert and accident investigators enroute. We went over there with the specific intent to determine the cause of this accident and to identify any factors which may have contributed to its severity.

We arrived in South Viet Nam, 28 hours after departure from Andrews, late in the afternoon of the 17th of May where I was met by commanders in the area. As you will see later, we were on the scene in sufficient time to be one of the first groups in the accident area after all bombs and ordnance had been cleared.

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1 To give you a better understanding of this base and to set the stage for the accident, I will refer you to this vertical photograph.

The base at Bien Hoa is under the control of the Vietnamese Air Force. U. S. military units are tenants.

As you can see, the main runway is oriented east and west. To give you a few details about the facilities on the base, I will start at the

west end of the runway. First, I call to your attention a new concrete parking ramp being constructed from MAP funds. This ramp will, when completed, be used by the A-1Hs of the Vietnamese Air Force. On the other side of the runway, you will see a perimeter road running basically parallel with the runway. The first large complex heading this way is the munitions storage area. This is a Vietnamese munitions storage facility which we use jointly with them. Continuing on around the perimeter road you should note the perimeter fence which extends around most of the base. As we proceed on around this end of the runway you will notice the new USAF bomb holding area and the main taxiway which leads to the focal point of aircraft operations. The base maintenance facilities are located in this general area. A subsidiary taxiway parallels this complex of buildings and leads to parking ramps where most of the Vietnamese A-1H and U. S. A-1E aircraft are normally parked. To the east is the main area from which Army forces operate. This is a steel matting strip. You will note the pierced steel planking provided for the parking of Army helicopters and light fixed-wing aircraft. Army helicopters operate from points throughout this particular area. The main housing and messing facilities are located in this area.

I would like now to return to the main munitions storage area. Munitions to be used on aircraft are delivered around the perimeter road, across this end of the runway along this road. Army munitions go here and Vietnamese and U. S. Air Force munitions flow here. As you can see

from the photograph, holding areas for munitions have been established in this area for U. S. A-1E aircraft and this area for the Vietnamese A-1H aircraft, and along this side of this ramp for the B-57 aircraft. Fuze assembly centers have been established in this location for the B-57s and in this area for the Vietnamese aircraft. Immediately to this side of the B-57 parking lot is the J-P4 fuel storage area which will be shown in more detail later. The accident occurred on the B-57 parking ramp which is in the center of the base complex.

To give you a better appreciation of the ingredients involved in this accident, I would like to first address myself to the high explosives. On the U. S. aircraft alone there were a total of 85 general purpose bombs, 10 each tanks of napalm and one aircraft loaded with incendiary bombs. The Vietnamese aircraft involved were loaded mostly with general purpose bombs, and fragmentation bombs. At the time of the accident approximately 135 U. S. personnel and approximately 25 Vietnamese personnel were in the immediate vicinity. 27 Air Force personnel and one Vietnamese were killed. 76 USAF and 29 U. S. Army personnel were wounded. 12 USAF aircraft (10 B-57s, 1 FSU, 1 A1-E) and 2 UNAF A1-Hs were destroyed.

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2 The day of the accident started normally. A number of B-57s were scheduled to fly bombing missions. Two flights were to strike targets in South Viet Nam. The third flight was scheduled to strike targets outside of South Viet Nam. The first of the flights, which were located in these positions, took off at 8 o'clock. The second flight was scheduled for an eight twenty (0820) takeoff.

CHART The third flight at eight forty (0840). I will use this chart to give  
3 you an idea of a typical mission in Viet Nam. The aircraft normally  
take off from Bien Hoa, proceed along a designated route to the target  
area, expend their bombs individually and return. All of these missions  
involve bombs with delay fuzes as well as bombs with instantaneous fuzes.

CHART To get back to the circumstances existing immediately preceding the  
2 accident, I should point out that the pilot of the aircraft located in  
the A-9 position aborted from the second flight, the other aircraft  
taxied to the west end of the runway in preparation for takeoff. Flight  
number 3 is indicated by red and green dots. The green dots indicate  
a crew at the aircraft. The red indicates the aircraft was loaded with  
bombs having delay fuzes in the tail and instantaneous fuzes installed  
in the nose. This fuze configuration was to permit the pilot some  
selectivity in bomb detonation in event of mission change. The aircraft  
in A-1 position was loaded with bombs with instantaneous fuzes and tanks  
of napalm. Two aircraft in number 3 flight had general purpose bombs  
with delay fuzes in the bomb bay and bombs with instantaneous fuzes  
installed externally under the wings. The other aircraft had bombs  
internally with delay fuzes and other bombs externally. When the number  
2 flight departed, position B-9 was vacated and shortly thereafter an  
F-8U of the U. S. Navy taxied into this position. This aircraft had  
landed at seven fifty-eight (0758) due to an emergency caused by fuel  
transfer problems, had taxied to the end of the runway where its guns  
were dearmed, and had proceeded to the ramp where he parked in this position.

Many of our personnel who had already launched their aircraft were naturally curious and gathered around this aircraft. Very shortly thereafter at eight twenty-three (0823) on Sunday, 16 May, an explosion occurred on this ramp.

Men fought the fire and moved out fourteen A-1Hs.

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This is a composite from aerial photographs taken on the afternoon following the accident. To reorient you, this is the parallel taxiway, and this is the fuel storage area. As an indication of the magnitude of the blast, you might be interested in knowing that a compressor, which is the large part of a jet engine, was thrown over 900 feet and through the roof of a building well off this chart. We know when the explosion occurred that 85 bombs were loaded aboard the aircraft. An analysis of this photograph showed that some 65 had exploded. This left a total of 20 to be dealt with. Shortly after ten o'clock on the morning of the 16th, Captain McFeron, an explosive ordnance disposal expert, pointed out to the commander that these unexpended weapons with delay fuzes were a serious hazard and should be immediately removed from the area. He reasoned that these delay fuzes, although the shortest delay should have been 24 hours, could very well go off earlier as a result of heat and/or explosion damage. Several of the bombs with delay fuzes were collected and placed on trailers. Others were placed in separate piles or on bomb hoists. At ten thirty (1030), Captain McFeron, and two airmen with him, were killed at this location when 4 or 5 bombs prematurely detonated.

One other airman with them was seriously injured and lost a leg. The Commander of the 2nd Air Division, General Moore, immediately cleared the area of all personnel and ordered no further demolition activity.

At seven twenty-one (0721) the following morning, 5 bombs located in this area exploded. After considerable discussion among the Commanders involved, Lt. Colonel O'Shaughnessy, a U. S. Army explosive ordnance man, with the concurrence of General Moore, purposely detonated 3 bombs with delay fuzes at this point. The final bomb with a delay fuze was located and detonated at four thirty (1630) on the afternoon of the 17th about the time we arrived at Saigon. Six weapons not having delay fuzes were safely moved out of the area during subsequent cleanup. In summary, of the 85 general purpose bombs in the area: 65 were exploded in the main blast; 6 were safely recovered; and, 14 were exploded or purposely detonated on the B-57 parking ramp.

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In an attempt to reconstruct this accident, over 100 witnesses were interviewed the first two days. Many of these had their backs turned or were not facing directly toward the blast. Some witnesses, however, viewed the blast from key vantage points. A tower operator in close proximity was facing the area and observed the first fire or explosion as indicated. An Army Chaplain was flying in a helicopter and thought it was the #1 or #2 aircraft. The pilot of a U-3 aircraft got the same impression. A Ground Control Approach operator was also reasonably sure that the explosion occurred in this area and took photographs before many of the airplanes caught on fire. Captain Greene, the pilot of this aircraft,

and the only surviving pilot from the third flight, homed in on the aircraft on the northwest corner of the ramp. Other witnesses in the southeast corner of the ramp thought it may have been the aircraft on B-5. Some of the best witnesses were located in this area near the A-1H parking ramp. Nevertheless a plotting of all of these witnesses' statements tended to focus on the first and second aircraft on the ramp.

As best we can determine, with one exception, all personnel located inside this green line were killed. The arrival of the F-8U and the congregation of U. S. airmen around it probably saved their lives. The lone exception, to our knowledge, of men not being killed inside the green line, is the crew chief of this aircraft who was standing just a little out from the nose. He had serious burns and was in serious condition at Clark Air Base in the Philippines. We did have an opportunity to talk to him and he was of the impression that his own aircraft had exploded. Thus, from witness statements and his, we cannot completely rule out this particular aircraft.

Many of the witnesses described the explosion as a whoosh, a low rumbling sound, and some even as a popping noise, which tends to support the idea that it may have been a low order detonation initially. These same witnesses were of the opinion that 10 to 15 seconds later a loud blast, which is descriptive of a full high order bomb detonation, took place. Others were of the impression that the full detonation took place first.



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2 In our investigation of this accident we explored many possible causes. One of the first was to make a complete rundown on the maintenance being performed on those aircraft remaining on the ramp. The aircraft in the B-5 position had some electrical malfunction of the trim control and had low tire pressure. The spare aircraft in the A-1 position had a previous malfunction on the remote magnetic indicator, but of more importance, required some work on the external bomb racks. Because of this difficulty, the aircraft was configured with fewer tanks of napalm than normal. The aircraft in the A-2 position required that the hydraulic accumulator, which provides rudder boost, be increased in pressure from 800 to 1,000 pounds per square inch (PSI). The aircraft in the A-9 position had not joined the second flight since bomb fuzing was not complete and the pilot and his crew were on the way to the operations building, walking between the row of B-57s, when the explosion occurred. Aircraft 893 on the back side of the ramp had previously suffered battle damage and was undergoing maintenance and the installation of new electrical wiring.

After tracking down all of these various maintenance actions, we concluded that the possibility of this type of maintenance contributing to the explosion was relatively remote.

Another possibility which was extensively explored, and is still being investigated, is the failure of B-57 starters. This starter has given the Air Force difficulty, although it has been improving the last several years. We have experienced some 20 failures since 1 January 1962.

I hope that this last presentation has not been too detailed. However, we believe that an understanding of the complexity of this fuze is necessary to appreciate why we are so concerned about it in our investigation.

Another area of concern was the numbers and qualifications of the bomb loading crews used on the B-57 aircraft. The increased operational requirements in Southeast Asia early this year indicated the immediate need for additional ordnance loading crews as well as other skilled personnel. So that the other Air Force commands throughout the world could retain a capability, and still support the increased operational and related munitions requirements in Viet Nam, a special project was conceived which selected the highest caliber personnel from the commands in the Continental United States. These personnel were placed on temporary duty in Southeast Asia. They were fully qualified on aircraft peculiar to their respective home commands. For example, a loading crew from Tactical Air Command might be fully qualified and experienced on the F-100 aircraft. Nevertheless, before they could be utilized to load munitions on B-57 aircraft, it was necessary that they be given additional training. Many of these men were placed on 120 days temporary duty in Southeast Asia and were to be returned to their parent commands. This training was accomplished at Clark Air Base in the Philippines. Upon arrival there, these men were selected and formed into 4-man teams for 3 to 10 days of training and certified as crews. As an example of the training given them, they received special briefings and practical

demonstrations on types of munitions, aircraft armament systems, bombing equipment, loading and fuzing, emergency procedures and safety. Before being dispatched to South Viet Nam, they were certified as being fully qualified by the commander of the Munitions Maintenance Squadron at Clark. At the time of the accident, a number of 4-man crews were available for use in B-57 operations at Bien Hoa. Some of these crews were permanently based at Bien Hoa and the others were there on temporary duty. Our analysis of the training, numbers, and skill levels of loading crews indicated that they were adequate and reasonably well trained. However, safety procedures were not always followed at Bien Hoa. Crew efficiency was not as effective as it should have been due to the minimum supervision exercised by the limited numbers of junior officers and senior non-commissioned officers. We have recommended that the Air Force reevaluate the program of short period temporary duty. It may well be that additional permanent change of station personnel should and must be made available to provide the necessary continuity and high level supervision required.

Another possibility which we investigated was the inadvertent firing of .20 mm ammunition from the A-1Hs parked on this and other ramps. As you will recall, the nearest of these aircraft were loaded with fragmentation bombs and had ammunition in their guns but did not have any rocket pods installed. We assured ourselves that even had one of the machine guns fired, bullets would have cleared the B-57 aircraft by a wide margin.

Another possibility explored was the involvement of ground support equipment. This aircraft does not require external power to start. The

pilots start the aircraft at a briefed time or use the starting smoke from the leader's aircraft as an indication to start their own. Shortly before the accident, a high pressure compressor was delivered to position A2. The aircraft in the A-3 position at that time had not taxied out. We were concerned about the compressor since cases have been reported of it exploding and catching on fire. In addition, we found a wheel, a muffler and part of a high pressure hose from this compressor in the crater at the A-2 position. We spent considerable time trying to determine whether this compressor could have started the accident at position A2. However, late in our investigation it was ascertained that the compressor had been moved at approximately 7:50 (0750) to the aircraft in the B-5 position to pump up a tire. The remains of this compressor were still in this location after the explosion although it was badly damaged. We concluded on the basis of evidence then available that this compressor played no part in the accident. Other ground support equipment, including a low pressure compressor was on the flight line but we could not ascertain whether it played a part.

Another possibility explored involved the use of oxygen and nitrogen in these aircraft. The aircraft in the A-2 position had been serviced with nitrogen. Nitrogen is used to purge fuel fumes from the system. Earlier in the week some of the end fittings on the high pressure hose for both oxygen and nitrogen high pressure hoses had been locally fabricated to replace damaged fittings. Nitrogen bottles have female fittings whereas oxygen bottles have male fittings. We were concerned that these

fittings may have been inadvertently mixed. There was also the possibility that oxygen had been placed in the nitrogen bottles or vice versa. Had oxygen been in the bottle used to purge this aircraft, it would have exploded as soon as the oxygen reached a proper concentration of JP-4 fuel. We verified that all oxygen and nitrogen bottles were accounted for. We further confirmed, by the use of standard Air Force test equipment, that all of the bottles contained the prescribed contents.

The final possibility considered by my team was sabotage. In looking into this subject, the first step was a review of base security procedures. As I previously stated, Bien Hoa is a Vietnamese Air Force installation and security responsibility for the base and surrounding area rests with them. Their forces have, however, been augmented by U. S. troops since the mortar attack on 1 November 1964 to enhance security.

Responsibility for the B-57 area, though guarded by Air Police at night, lies with the maintenance crews of the aircraft after they come to work in the morning. Vietnamese personnel are not permitted in the B-57 area unless authorized and escorted. Even to enter the base gates, an individual may be required to subject himself to search, in addition to examination of his pass.

We concluded that the physical security is adequate.

The possibility of sabotage was considered immediately upon receipt of the flash report of this matter. Specific inquiries were conducted, both on and off-base to explore the possibilities of gunfire, introduction of explosive devices and tampering. 140 interviews had been conducted at the time we left Bien Hoa.

In the absence of a specific finding as to the cause of the Bien Hoa explosion, sabotage cannot be completely eliminated as a possibility. On the other hand, there is no evidence of gunfire from off or on-base. There is no evidence of unauthorized personnel having gained access to aircraft. There is defense in depth of the perimeter to the extent that enemy infiltration would be extremely difficult. Internal security of the base is specifically designed to detect infiltration both at the perimeter and at the B-57 parking area. Although security is the responsibility of the VNAF, U. S. Forces are employed in critical areas.

To summarize our specific investigative actions, we have examined some of the more obvious possibilities in depth and reached the following conclusions:

1. The qualifications of individuals were found to be satisfactory. However, supervision of munitions handling and loading did not fully conform to Air Force standards.
2. Maintenance being performed on aircraft played no part in the accident.
3. The B-57 starter conceivably could cause an accident under these circumstances and is still a suspect.
4. Aerospace ground power equipment is not believed to have contributed to this accident, but cannot be completely eliminated at this time.
5. The delay fuze remains a suspect.
6. Security of the base was satisfactory but the possibility of sabotage requires and is under continuing investigation.

7. There was no evidence to indicate an overt attack by the Viet Cong.

A natural question which comes to everyone's mind is "Why was the accident so catastrophic?" The explosion occurred when a large number of aircraft were loaded with fuzed bombs in preparation for an operational mission. These aircraft were parked much closer together than the Air Force safety criteria specifies. Under normal stateside conditions these aircraft would have been parked at least 175 feet apart. This criteria had been waived in South Viet Nam because of the limited space available. An understanding of why the area was so congested can only be explained by some rationalization of the operation in Viet Nam and how it developed. The requirement for aircraft sorties and ordnance delivery in this area has increased steadily. For example, the sorties flown almost doubled from December to April of 1965. At the same time, the tonnage of bombs dropped increased nearly five-fold, which indicates the increased capability of aircraft now being employed. In order to meet this steady increase in operational requirements, increased aircraft had been assigned to the theater and to Bien Hoa. With the rapid build up in forces during the past six months, the construction of needed operational facilities had not been able to keep pace, thus aircraft operating areas became increasingly congested. Real estate for expansion was at a premium.

After the mortar attack in November, it was obvious that temporary revetments for aircraft would be necessary to provide protection against a recurrence of such an attack. The use of sandbags was directed from

the start as the best and quickest way to provide such protection. Plans and funding action were initiated to provide for permanent type revetments as a follow-on. Over 1 million bags were used for sandbagging in South Viet Nam. Construction was started on some 16 sandbag revetments at Bien Hoa with in-house labor. In addition, extensive sandbagging was provided for personnel, communications centers, key guard posts and bomb holding points. After work was started on these temporary revetments, permanent construction was started in the same area, thus the use of these temporary revetments was limited. The Commander of the Second Air Division considered the requirement for additional sandbag revetments, including the possibility of revetments on the B-57 ramp at Bien Hoa. He concluded that such revetments would have so limited the movement of aircraft and ground support equipment and would have so congested his available parking areas that the required mission capability would have been reduced to an unacceptable level. He knew that such revetments, while providing some protection against mortar attacks, would provide little protection against accidental detonation of our own ordnance while loaded aircraft were parked with minimum spacing in the area. He explained that revetments on this small ramp would further reduce the critically short parking areas available. It was planned to tow aircraft into the temporary revetments after the last mission of the day and back to the cement ramp in the early morning, since mortar attacks were extremely unlikely during daylight hours.



He pointed out that engines could not be started in the revetments because jet blasts would damage and burn the sandbags causing the revetments to collapse. Further, he considered mortar attack as less likely than it was in October due to the increased base security provided in depth by the Vietnamese and the U. S. Army. He pointed out that accidental explosions of the type experienced in Bien Hoa were rare. For example, only 8 such incidents were recorded for the whole of WW II and Korea. He explained that, in conjunction with the operational training missions with the Vietnamese Air Force, beginning in December 1961, and the combat operations since the Gulf of Tonkin incident, over 66 million lbs of munitions had been loaded and expended and that since September 1964, which is the point in time when the Air Force began to use the delay fuzes in Viet Nam operations, a total of 2.4 million lbs of munitions had been expended using over 6,000 of these fuzes, without incident. The Chief of Staff directed that I return to provide him with an interim report on 24 May 65, and that the investigation be continued under the direction of Major General Meyers, Deputy Commander of the 2d Air Division. His Investigating Board, which commenced work at the same time as my team, has been augmented with fire pattern, structures and explosive specialists to assist him.

Now I would like to discuss actions taken by the Air Force. The interviewing of witnesses is continuing. Every effort is being made by General Meyers' Board, supported by the entire resources of the Air Force, to find a clue that can lead to a positive determination of the cause of the initial fire or explosion.

During and immediately subsequent to my investigation, numerous actions were initiated to preclude a recurrence of this incident.

(1) The use of delay fuzes in Southeast Asia was immediately suspended pending extensive testing of this fuze.

(2) All delay fuzes of one type have been withdrawn from Southeast Asia and are being held at Clark Air Base.

(3) Bien Hoa has established a single bomb holding area and the assembly of fuzes has been consolidated in one location.

(4) A joint maintenance team from 2d Air Division and 13th Air Force visited this base and others to insure that maintenance organization, particularly as it pertains to the handling of munitions, is efficiently supervised and operating properly.

(5) A safety survey of all jointly occupied bases is underway by the 2d Air Division with representation from the Vietnamese Air Force, the Vietnamese Department of Aviation, and the U. S. Marine Corps to insure that all of these agencies identify and correct any explosive hazards which may affect not only their own forces but the forces of their counterparts.

(6) An assistance team, headed by a general officer from Hq Pacific Air Forces, went to Bien Hoa to assist the base in determining if additional equipment is required for handling explosives and to assist in the establishment of the safest possible system for handling munitions.

(7) An Air Force Civil Engineering Office has been established in Bangkok and Saigon to review construction of badly needed facilities to the maximum practicable extent.

In addition to these actions which have been taken in Southeast Asia, Hq United States Air Force directed the establishment of a Study Group to make a thorough analysis of the B-57 aircraft and the munitions carried on it in Viet Nam, in an attempt to duplicate malfunctions which may have caused the accident at Bien Hoa. This test program is now underway at Eglin Air Force Base, Florida, and by a team of 8 specialists from the United States at Clark Air Base.

The Headquarters also has directed a comprehensive laboratory - type test of the delay fuzes which were in use in Viet Nam. This testing is now completed. Approximately 660 fuzes representing 26 lots with manufacture dates from 1945 through 1954 have been subjected to varying degrees of inspection, handling environment, shock treatment, chemical analysis, and functional testing. Testing indicates that the delay fuzes are safe for field use providing the established safety instructions and handling procedures are followed.

I want to reiterate that we have not identified the specific cause of the accident at Bien Hoa and that the investigation is continuing.

I have an excellent color film taken shortly after the explosion that I would like to show before answering any questions.