UNITED STATES AIR FORCE
GROUND ACCIDENT INVESTIGATION
BOARD REPORT

364TH TRAINING SQUADRON
82ND TRAINING WING
SHEPPARD AIR FORCE BASE, TEXAS

TYPE OF ACCIDENT: ON-DUTY FATALITY
LOCATION: SHEPPARD AIR FORCE BASE, TEXAS
DATE OF ACCIDENT: 18 AUGUST 2010
BOARD PRESIDENT: LT COLONEL ANDREW H. BRUCE

Conducted IAW Air Force Instruction 51-507

United States Air Force Ground Accident Investigation Board Report

On-Duty Fatality
Sheppard Air Force Base, Texas
18 August 2010

EXECUTIVE SUMMARY

On 18 August 2010, at approximately 0615 local time (L), a 21-year-old active duty, Senior Airman (P1), collapsed while running as part of a scheduled physical fitness training (PT) session and was pronounced dead two days later on 20 August 2010 (Tab W). P1 was assigned to the 99th Logistics Readiness Squadron at Nellis AFB, NV but was on Temporary Duty (TDY) at the 364th Training Squadron, Sheppard AFB, TX for a Refueling Equipment Maintenance class.

At approximately 0545L, P1 and his classmates arrived at the Sheppard AFB running track for their weekly unit physical fitness training (PT). Several other organizations, including the 82nd Medical Squadron, were also running on the track that day. The 1-mile track is a narrow oval approximately ½ mile long on each side. After Reveille sounded at 0600L, P1 and his class started their 2-mile run. After stopping briefly, as if to tie a shoe, P1 got back up and started running again. Then around the 1.6 mile mark at approximately 0615L, a classmate witnessed P1 stop running, hunch over with his hands on his knees, followed quickly by taking a knee and rolling to the ground. Several runners close to P1 on the track were the first to reach him as he lay face down in the grass just off the inside of the track. P1's breathing was forced and erratic; he had a pulse but was unresponsive to voice commands. At approximately 0622L, a nurse practitioner joined the group and Emergency Medical Services (EMS) was called. At the same time, the Automated External Defibrillator (AED) located at the track was brought to the scene by another bystander.

After a few moments P1's pulse and breathing stopped. The Nurse and other medical professionals started CPR while the AED was hooked up and powered on. CPR was continued for several cycles, including two AED shocks, at that point the ambulance arrived. CPR was then continued with a facemask and fresh person on compressions, and fire truck support was called in. While P1 was prepped for movement to the ambulance, the AED recommended CPR and no shock. P1 was then loaded into the ambulance with the EMTs and W1. Approximately one minute later, the AED recommended a third shock which was delivered. EMTs then removed the AED and hooked up the ambulance defibrillator and an intravenous line. At 0642L, the Ambulance left for the hospital while EMTs continued resuscitation efforts, including two shocks from the defibrillator. The ambulance arrived at the hospital at 0653L and P1 was transferred to the Emergency Room (ER).

The Doctors and Nurses were able to stabilize P1 a few hours later and he was admitted to the hospital. After multiple tests confirmed no brain activity, his Next-of-Kin (NoK) authorized suspension of life support measures. P1 was taken off of drugs and ventilator, and he was pronounced dead at 1600L on 20 August 2010. The autopsy report determined P1 died from sudden cardiac death (SCD) resulting from an arrhythmia caused by an enlarged heart muscle.

SUMMARY OF FACTS
ON-DUTY FATALITY
SHEPPARD AFB, TEXAS
18 AUGUST 2010

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COMMONLY USED ACRONYMS AND ABBREVIATIONS

ACC	Air Combat Command
ACLS	Advanced Cardiac Life Support
AED	Automated External Defibrillator
AETC	Air Education and Training Command
AFB	Air Force Base
AFI	Air Force Instruction
AHA	American Heart Association
BLS	Basic Life Support
CPR	Cardiopulmonary Resuscitation
EKG	Electrocardiogram
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
GAIB	Ground Accident Investigation Board
L	Local Time
MEPS	Military Entrance Processing Station
MDG	Medical Group
NoK	Next-of-Kin
PA	Physician Assistant
PT	Physical fitness Training
SCD	Sudden Cardiac Death
SABC	Self Aid and Buddy Care

The above list was compiled from the Summary of Facts, the Index of Tabs, and Witness Testimony.

SUMMARY OF FACTS

1. AUTHORITY AND PURPOSE

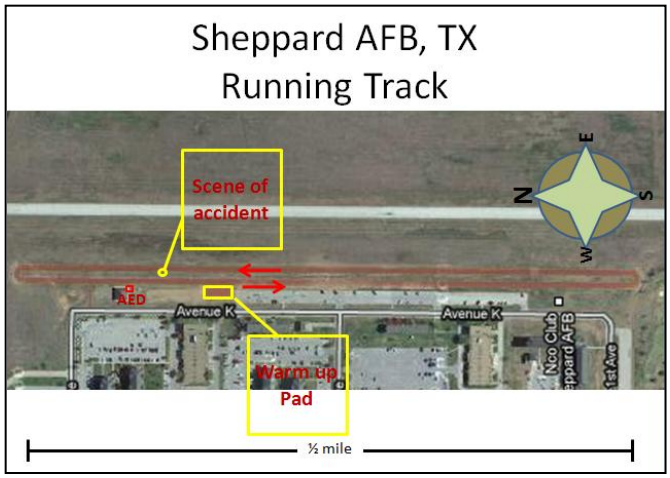
Authority. On 1 October 2010, Lieutenant General William J. Rew, Vice Commander, Air Combat Command (ACC), appointed Lieutenant Colonel Andrew H. Bruce as Board President of a Ground Accident Investigation Board (GAIB) (Tab X). The GAIB was convened under AFI 51-507, *Ground Accident Investigations*, paragraph 2.1.1 and a legal advisor, medical advisor, and recorder were also appointed per paragraph 2.2.

Purpose. The purpose of this investigation is to thoroughly inquire into the facts surrounding the accident that occurred on 18 August 2010 involving the death of a military member participating in unit PT at Sheppard AFB, TX and prepare a publicly releasable report. The GAIB serves to obtain and preserve evidence for use in litigation, adjudication of tort claims, disciplinary actions, administrative actions, and for other purposes. This report is available for public dissemination under the Freedom of Information Act (5 U.S.C. § 522) and the Air Force Supplement to Department of Defense Regulation 5400.7 *Department of Defense Freedom of Information Act Program*.

2. ACCIDENT SUMMARY

On 18 August 2010, a 21-year-old active duty Senior Airman, Participant 1 (P1), collapsed during unit PT and was pronounced dead two days later on 20 August 2010 (Tab W). P1 was assigned to the 99th Logistics Readiness Squadron at Nellis AFB, NV but was on Temporary Duty (TDY) at the 364th Training Squadron, Sheppard AFB, TX for a Refueling Equipment Maintenance class (Tab O-3).

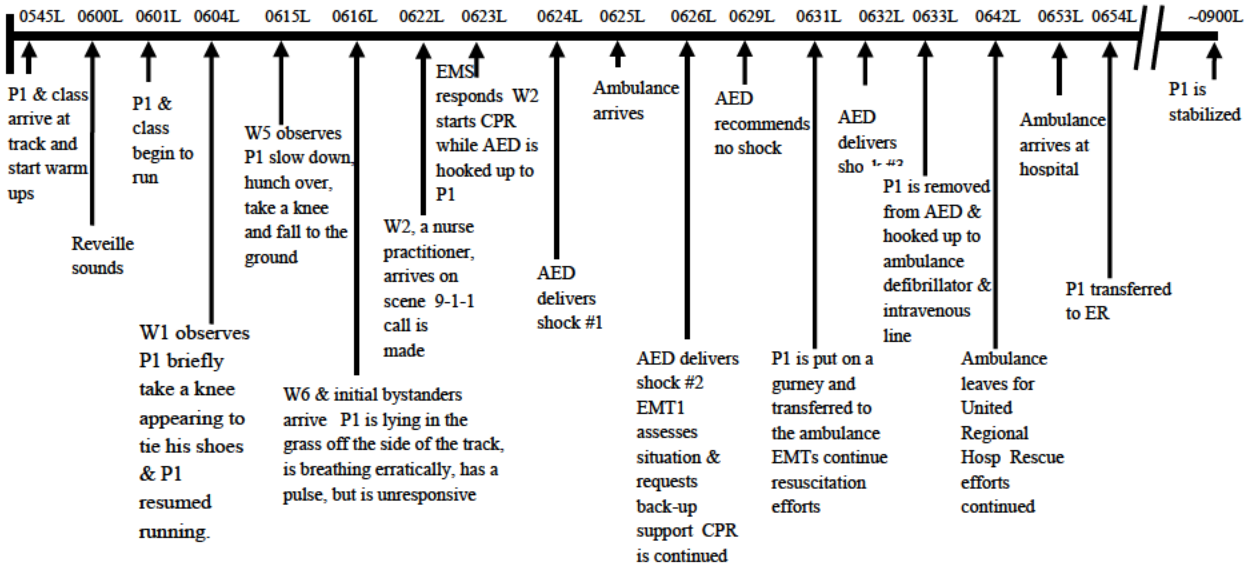
At approximately 0545L, P1 and his classmates showed up at the Sheppard AFB running track for their weekly unit PT (Tab V-1, V-5). Witness statements from classmates reported that he was acting normally and joking around prior to warm ups (Tab V-5). In addition to P1's class, there was a 30-person Running Improvement Program (RIP) Class on the track that morning (Tab V-2, V-6), as well as members from the 82nd Medical Squadron also running for unit PT (Tab V-3, V-4). The 1-mile track is a narrow oval approximately ½-mile long on each side (Tab Y-1). After Reveille sounded at 0600L, P1 and his class started their 2-mile counterclockwise run which is two laps around the track (Tab V-1, V-5). Shortly after starting, Witness 1 (W1) saw P1 slow down and take a knee as if he were tying his shoes (Tab V-1). Several seconds later, P1 got back up and started running again until approximately the 1.6 mile mark, which placed him on the back stretch of the track prior to the final turn on his second lap (Tab V-1, V-2, V-5, V-6). It



was approximately 0615L (Tab V-1, V-3, V-4, V-5, V-6). At this point, one of his classmates, Witness 5 (W5) who had exited the final turn, observed P1 on the opposite side of the track slow to a stop, hunch over with his hands on his knees, followed quickly by taking a knee and rolling to the ground (Tab V-5). Witness 6 (W6), who was behind P1 on the track, was the first to reach him (Tab V-6). W6 found P1 lying face down in the grass just off the inside of the track (Tab V-6). P1's breathing was forced and erratic (Tab V-1, V-2, V-3, V-6). W6 and another bystander rolled P1 onto his back; P1 had a pulse but was unresponsive to voice commands (Tab V-3, V-6). At approximately 0622L, Witness 2 (W2), a nurse practitioner in the RIP class joined the group and Emergency Medical Services (EMS) was called (Tab V-2). At the same time, the Automated External Defibrillator (AED) located at the track was brought to the scene by another bystander (Tab V-2).

P1 was breathing irregularly with sounds of secretions in his throat, so he was rolled onto his side (Tab V-2). A few moments later P1's pulse and breathing stopped. He was rolled onto his back by W2 and Witness 3 (W3). Then W2 and another bystander started CPR while the AED was hooked up and powered on (Tab V-2, V-3, V-6). Witness 4 (W4) joined in to help with compressions shortly after CPR started (Tab V-3, V-4). After analyzing P1, the AED delivered shock#1 and CPR was continued (Tab V-2, V-3, V-5). Two minutes later, as the ambulance arrived, the AED delivered shock#2 (Tab V-2, V-3, V-5). Assessing the situation, EMT1, a paramedic, called for fire truck support at 0627L. CPR was continued with a facemask and fresh person on compressions while P1 was prepped for movement to the ambulance (Tab V-2, V-3, V-5). Two minutes later, the AED recommended continued CPR and no shock (Tab V-2). At 0631L, P1 was loaded onto the backboard and gurney and placed into the ambulance with the EMTs and W1 (Tab V-1, V-2). Once in the ambulance, the AED delivered shock#3 and EMT1 removed the AED and hooked P1 up to the ambulance defibrillator and intravenous line. At 0642L (Tab V-1), the Ambulance left the track for United Regional hospital while EMTs continued resuscitation attempts which included two shocks from the ambulance defibrillator. The ambulance arrived at the hospital at 0653L and P1 was transferred to the Emergency Room (ER).

The Doctors and Nurses were able to stabilize P1 a few hours later. He was admitted to the hospital, and remained there for the next two days. After multiple tests confirmed no brain activity, his Next of Kin (NoK) authorized suspension of life support measures. P1 was taken off of drugs and ventilator, and he was pronounced dead at 1600L on 20 August 2010 (Tab W). The autopsy report determined that P1 died from sudden cardiac death resulting from an arrhythmia caused by hypertrophic cardiomyopathy, an enlarged heart muscle.



3. BACKGROUND

The Air Force Fitness Program encourages commanders to participate in physical fitness training up to 90 minutes, three to five days per week. Consistent with mission requirements, commanders are encouraged to schedule or authorize military service members time to participate in physical fitness training during the duty day. In addition, all Air Force members must complete a fitness assessment at least once per year which consists of timed sit-ups, push-ups, a 1.5 mile run, and a waist circumference measurement.

4. SEQUENCE OF EVENTS

<u>18 August 2010</u>

0545L P1 and class arrive at track and start warm ups
0600L Reveille sounds
0601L P1 and class begin running.
0604L W1 observes P1 briefly takes a knee, appears to be tying his shoes. Several seconds later, P1 resumes running.
~0615L W2 observes P1 slow down, hunch over, take a knee and fall to the ground
0616L W3 and initial bystanders arrive at P1 lying face down in the grass off the inside of the track. P1 is breathing erratically, has a pulse, but is unresponsive to commands.
0622L W4, a nurse practitioner, arrives on scene. 9-1-1 call is made. P1 is noticed to have a pulse and sounds of secretions in his throat so he is turned over onto his side (the recovery position) while attendees continue to monitor pulse, breathing and responsiveness.
0623L EMS responds to 9-1-1 call. P1's pulse and breathing stop. W4 starts rescue breathing while AED is hooked up to P1. CPR is started and continues throughout.
0624L AED delivers shock #1
0625L EMS arrives.

0626L AED delivers shock #2. EMT1 (Paramedic) assesses situation and requests fire truck support. EMT2 (Basic) provides facemask for CPR breathes.
0629L AED recommends no shock
0631L P1 is loaded onto a backboard and gurney then transferred to ambulance. EMTs continue resuscitation efforts.
0632L AED delivers shock#3
0633L P1 is removed from AED and hooked up to ambulance defibrillator and intravenous line.
0642L Ambulance leaves for United Regional hospital. P1 is shocked two additional times while enroute to the hospital by ambulance defibrillator. CPR was performed throughout.
0653L Ambulance arrives at hospital.
0654L P1 transferred to ER
~0900L P1 stabilized
20 August 2010
1600L P1 pronounced dead

5. MAINTENANCE

Not applicable.

6. EQUIPMENT AND SYSTEMS

An AED can be used by individuals without specific medical training to treat cardiac arrest victims. Ventricular fibrillation is the most common rhythm detected in cardiac arrest. Defibrillation is more successful than chest compressions in converting ventricular fibrillation to a normal heart rhythm. If the AED recognizes ventricular fibrillation, it verbally instructs the user to shock the cardiac arrest victim. The closest AED to the mishap was within ¼ mile, and was put into use by medically trained personnel within a few moments of pulse and breathing stoppage. AED's are required to undergo yearly inspection and maintenance. The device in question had been inspected and calibrated on 4 Feb 2010, and was in compliance at that time. (Tab D-1, D-2). There is no evidence to suggest equipment, vehicles or facilities contributed to the mishap.

7. ENVIRONMENTAL CONDITIONS

The weather was overcast and 75° F with light winds out of the Northeast. It had rained the night and early morning prior to the incident and the grass between the two sides of the track was wet. From the time of the incident until the ambulance arrived it was still dark out and the west side of the track was not well lit. There is no evidence to suggest environmental conditions contributed significantly to the mishap.

8. PERSONNEL QUALIFICATIONS

The emergency responders to the mishap were: 1) initial responders: W2, W3, W4; and 2) EMS responders: the EMT1 and EMT2. Emergency response qualifications of these individuals are as follows:

W2. Licensed by the Texas Board of Nursing, current to 31 July 2012; Basic Life Support (BLS) for Healthcare Providers, attended July 2010 and expires July 2012 (this training includes AED and CPR training); Advanced Cardiac Life Support (ACLS) for Providers Course, attended December 2008 and expires December 2010.

W3. Licensed by the California Board of Registered Nursing, current to 30 April 2011; BLS, attended March 2010 and expires March 2012 (this training includes AED and CPR training).

W4. BLS, attended March 2009 and expires March 2011 (this training includes AED and CPR training); ACLS, attended April 2010 and expires April 2012.

EMT1. Certified by the National Registry of Emergency Medical Technicians as an EMT-paramedic and his certification expires March 2012; Licensed in the state of TX, current to 31 March 2012; BLS, attended March 2009 and expires March 2011 (This training includes AED and CPR training). ACLS, attended September 2009 and expires September 2011.

EMT2. Certified by the National Registry of Emergency Medical Technicians as an EMT-basic, and his certification expires on 31 March 2013; BLS, attended March 2009 and expires March 2011(This training includes AED and CPR training).

The qualifications of all emergency responders met or exceeded standards.

9. MEDICAL FACTORS

The Raleigh NC Military Entrance Processing Station (MEPS) did a physical exam on P1 on 24 Jan 2008. This physical exam does not require an electrocardiogram (EKG), and the Raleigh MEPS did not do one. P1 reported no existing or service disqualifying medical problems. The Raleigh MEPS did not conduct any specialized testing or review his preceding medical records. Based on the results of the physical exam at the Raleigh MEPS, P1 was medically cleared for military service.

The autopsy report concluded that P1 died as a result of cardiomegaly with left ventricular hypertrophy and that the manner of death was natural. Hypertrophic cardiomyopathy can increase the arrythmogenicity of the heart tissue. This can result in a nonperfusing cardiac arrhythmia that can rapidly progress to full cardiac arrest. This can occur with little to no warning signs or symptoms. For 95% of individuals who die of Sudden Cardiac Death (SCD), autopsy reports reveal cardiac abnormalities. This is the most common cause of SCD in athletic patients younger than 35. After reviewing all available medical data, P1 was an otherwise healthy male with no outstanding health issues (Tab W).

10. OPERATIONS AND SUPERVISION

P1 was participating in unit PT at the time of the mishap. This training does not require an Air Force certified Physical Training Leader or a Fitness Screening Questionnaire, although these are required for official Air Force fitness assessments. P1's supervisor, W1, supervised the training

and was present and participating in the run. There is no evidence that improper operations or supervision contributed to the mishap.

11. HUMAN FACTORS

A human factor is an environmental factor or individual psychological factor a human being experiences that contributes to or influences performance during a task. There is no evidence to suggest human factors contributed to the mishap.

12. GOVERNING DIRECTIVES AND PUBLICATIONS

a. Air Force Instruction (AFI) 36-2905, *Fitness Program*, 1 July 2010
b. AFI 48-123, *Medical Examinations and Standards*, 5 June 2006
c. AFI 51-507, *Ground Accident Investigations*, 15 October 2004

There are no known or suspected deviations from directives or publications by personnel involved in the mishap or emergency response.

4 January 2010

ANDREW H. BRUCE, Lt Col, USAF
GAIB, President