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AF Instruction 51-503
Aircraft Accident and Safety Investigations
11 April 2000

OFFICE OF THE SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

- Purpose of an Accident Investigation Board (AIB) is to provide a publicly releasable report of the facts and circumstances surrounding the accident to include a statement of opinion on the course of the accident; to gather and preserve evidence for claims, litigation, disciplinary and adverse administrative actions; and for all other purposes.
- Purpose of a Safety Investigation Board (SIB) is for mishap prevention under AFI 91-204, "Safety Investigations and Reports." Safety Investigations determine the causes of accidents to prevent future accidents. Promises of confidentiality may be granted to promote full and timely disclosure of information statements and documents given under a promise of confidentiality are privileged and cannot be disclosed outside of Air Force channels.

NUCLEAR REGULATORY COMMISSION

AIB Reports are assembled as follows:

- Cover Sheet
- Executive Summary
- Summary of Facts
- Statement of Opinion
- Index of Tabs
- Tabs (Supporting Documents)

Docket No. _____	Official Ex. No. <u>000</u>
In the matter of <u>PFS</u>	
Staff _____	IDENTIFIED <input checked="" type="checkbox"/>
Applicant <input checked="" type="checkbox"/>	RECEIVED _____
Intervenor _____	REJECTED _____
Other _____	WITHDRAWN _____
DATE <u>4-11-02</u>	Witness _____
Clerk <u>S. Snider</u>	

The AIB Reports provide valuable information for determining the cause of the mishap as described in Tab H of the Report. The following excerpts also clearly demonstrate and documents the utility of the AIB Report in determining pilots' ability to see and avoid.

Some selected historical anecdotes from earlier mishaps are also provided to underscore the utility of the AIB process and product.

Documented Examples Of Pilot Avoidance In F-16 Accident Investigation Reports

On 26 DEC 89, an F-16C piloted by Captain Jeffrey Sturmthal, USAF, experienced engine failure. "The pilot's attempts to regain thrust were unsuccessful." During his zoom and resulting glide, "the pilot made frequent corrections to his flight path to avoid populated areas." The pilot "intentionally delayed ejection ... to further avoid populated areas in his flight path." He successfully ejected at 1400 ft. MSL. AFR 110-14 (AFI 51-503) AIB Report, HQ 7th AF, USAF.

On 16 MAR 90, an F-16A piloted by Captain Daniel West, USAF, experienced engine failure. "After at least two unsuccessful attempts to restart the engine, Captain West determined that he could not make a landing at Wendover, pointed the aircraft toward an uninhabited area of the desert and successfully ejected." AFR 110-14 (AFI 51-503) AIB Report, HQ AFLC, USAF.

On 20 FEB 91, an F-16C piloted by Captain Brock Strom, USAF, experienced "catastrophic engine failure." Captain Strom..."could see the ground and determined that it was safe to jettison his wing fuel tanks and ordnance...." After descending "through the clouds" (scattered to broken), he determined that he could not glide to the nearby airfield (Dyrbakir, Turkey). "He checked his flight path and determined there was nothing to harm, no inhabited areas or buildings." He then successfully ejected. AFR 110-14 (AFI 51-503) AIB Report, HQ 16th AF, USAF.

On 16 DEC 91, an F-16C piloted by Captain David R. Rue, USAF, experienced an "engine malfunction" and fire. He commenced "a descending right hand turn toward an emergency divert airfield." Captain Rue then decided to initiate a "controlled ejection" and did so. "The aircraft impacted in an open field...and Captain Rue walked to a nearby house and made a collect telephone call to Shaw AFB." AFR 110-14 (AFI 51-503) AIB Report, HQ 9th AF, USAF.

On 31 MAY 92, an F-16C piloted by 1st Lieutenant Scott L. Gierat, USAF, experienced an engine seizure after smoke and fumes in the cockpit. "After turning the aircraft toward an uninhabited area, the pilot ejected safely and the aircraft crashed and was destroyed." AFR 110-14 (AFI 51-503) AIB Report, HQ 9th AF, USAF.

On 18 SEP 92, an F-16A from the Minnesota ANG experienced "severe engine bangs ...accompanied by a severe loss in thrust." The pilot "turned the aircraft to a northerly heading toward the published controlled bailout area to minimize ground impact damages or injuries.... The pilot pointed the aircraft to a low-populated area and ejected." AFR 110-14 (AFI 51-503) AIB Report, HQ MN ANG, USAF.

On 2 FEB 94, and F-16CJ piloted by Captain Michael A. MacWilliam, USAF, experienced "an explosion followed by loss of thrust.... After several

unsuccessful airstart attempts, Captain MacWilliam directed the aircraft toward an uninhabited wooded area and safely ejected." AFR 110-14 (AFI 51-503) AIB Report, HQ 9th AF, USAF.

20 Jan 96. After refueling and enroute to their destination at flight level 310, the mishap aircraft (MA) [F-16] declared an emergency for trapped fuel and started an emergency divert to Cannon AFB, NM. During the divert, the MA engine flamed out and the Mishap Pilot (MP) jettisoned his external fuel tanks. Approximately seven minutes later, the MP directed the aircraft away from inhabited areas and ejected. He testified that he delayed ejection to below recommended altitude to insure collateral damage was minimized. The MP initiated a successful low altitude ejection approximately eleven miles northwest of Cannon AFB. The MA impacted the ground in an uninhabited field and was destroyed. The ejection seat, canopy and parachute were from 425 feet to 900 feet short of the aircraft at the crash site. (There was no mention of the external fuel tanks causing any damage)

7 Jun 96. The MA [F-16] was in the process of doing a weapons system check enroute to the training range, above the clouds at about 10,000 feet MSL, when he heard a loud bang. He instinctively turned back towards home base and began engine airstart procedures while observing the RPM rapidly decay to zero. Realizing that he did not have enough altitude to glide to home base with the engine seized, the MP elected not to eject from the MA until it dropped below the clouds. He realized that an airstart was the only possibility for a return to the airfield with or without his centerline fuel tank. He therefore decided to retain the centerline fuel tank due to his position above the clouds and his inability to determine a safe impact point. He penetrated the clouds and visually cleared his aircraft away from inhabited farm sites, correcting slightly to the right towards a clear field area. He ejected at approximately 1,600 feet AGL, two minutes after first noticing the engine problem. The aircraft impacted the ground in a cornfield.

11 Jul 96. While near Pensacola in the initial descent for arrival at Eglin AFB, FL, the MA [F-16] experienced an engine failure at approximately 21,000 feet MSL. He performed the critical action procedures for an engine airstart, except that he chose not to accomplish the first step – "External Stores – Jettison", because he was approaching a populated area at the time and felt he could delay dropping his wing fuel tanks until over a suitable area. The MP saw an

alternative runway at Pensacola and turned for a straight-in flameout approach to Runway 17. He didn't really think he could make it to the airfield unless the engine restarted, but decided to head that way just in case it did start. There was a large bay area just to the east of the runway and the MP decided that if the "didn't get any help from the engine," he'd "turn the airplane out over the bay and eject". During the turn, the engine restarted and stabilized at idle RPM. All cockpit engine indications were normal although the MP could feel an unusual, pronounced airframe vibration. During the emergency approach, approximately 4.5 miles from the runway, the engine failed again. The MP reaccomplished airstart procedures and the engine restarted almost immediately. At this point, the MP knew he could not make it to the runway and was below the recommended minimum bailout altitude. There were houses everywhere he looked below him. He started a slight right hand turn to aim the MA at an area where "there were few, if any, houses". Somewhere in the turn, MP advanced the throttle to full power and the engine failed a third time. The MP continued to try and guide the aircraft into an open area. When the MA so low and slow that his control inputs weren't affecting its flight path, the MP ejected. He ejected at 209 feet AGL and landed in a tree. The MA landed in a residential area 1.5 miles northwest of Pensacola Regional Airport, destroying a house, severely damaging another and killing a resident.

21 Nov 96. The MA had completed a night air refueling and was enroute to base for a full stop landing. While leveling off at 10,000 feet on an enroute descent, the MA experienced a loud bang which knocked his feet off the rudder pedals. He noticed a loss of thrust and decreased engine RPMs. The wingman noticed sparks, flames, and baseball sized pieces of glowing debris exiting the tailpipe. The MA attempted airstart procedures twice, but when they were unsuccessful, it became apparent to him that the distance to Tulsa was too great to effect a glide and that an ejection to a clear area was necessary. There was an overcast layer at 2100 ft AGL with tops at 3200 feet, clear above. Moonlight was 60 to 70%. Upon receiving a directional heading from the Tulsa radar facility to an unpopulated area, the MP turned to this heading and prepared for ejection. He ejected at approximately 4-5,000 feet AGL and at about 150 knots. The aircraft impacted in a field. (The attached Statement of Opinion states that when faced with no restart capability, the MP wisely chose the next course of action - steer clear of populated areas and bail out).

15 Dec 98. The Mishap Aircraft (MA) was leading a two ship of F-16s that had completed its training on the bomb ranging range and started its return to the base. The flight had departed the range and was in a climb at approximately 2,900' AGL and 315 knots when the engine failed. The pilot initiated the Critical Action Procedures (emergency procedures) for a low altitude engine failure. When it became clear that he did not have sufficient altitude and airspeed to achieve an airstart, as stated in the Accident Investigation Report, "...ejection became his primary consideration. He made initial turns to avoid populated areas before jettisoning his fuel tanks." Although the report does not mention any further maneuvering by the pilot, he did attempt two airstarts and the airplane impacted "on open, level, uninhabited terrain."

7 Jan 99. This was a training mission at Luke AFB. The mishap aircraft was a two seat F-16 with a pilot (referred to as MP in the report) in the front cockpit and an instructor pilot (MIP) in the rear cockpit. Just after raising the landing gear, approximately 50 seconds after takeoff, the engine failed. The aircraft was at between 200'-500' AGL with 200 knots of airspeed. The report clearly indicates that the pilots initially started a right turn back toward the airfield but quickly reversed their direction "...to turn left toward the relatively unpopulated area northwest of Luke..." The pilot also "...waited for a few seconds to jettison the stores because he wanted to find an unpopulated area..."

12 Jul 99. The mishap F-16 aircraft (MA) was at approximately 13,160' AGL when the engine failed. The mishap pilot (MP) turned toward the nearest suitable field for landing while following the emergency procedures to restart the engine. The airstart attempts were unsuccessful and the engine appeared to have seized. The MP, noting that his current altitude and airspeed were insufficient to allow him to successfully glide to the airport, "The MP turned the MA towards an uninhabited area in preparation for ejection."

31 Aug 00. The mishap F-16 was in the working area off the New Jersey coast at approximately 16,000' when the engine began to fail. The pilot turned back toward land and flew toward Atlantic City International Airport. Approximately 7 miles from the airport at 5,000' altitude, the pilot determined that the ceiling was too low for an engine-out approach. "The MP made a left hand turn to get the aircraft over the water to avoid any populated areas." The MP then entered the clouds, he subsequently caught a glimpse of the area below the clouds and

was able to visually orient himself. He then directed one of the other aircraft to "clear the area for boats." The MP ejected shortly thereafter. The aircraft impacted in the water.

Historical Examples of Pilot Avoidance

In 1956, Captain George Fredericks, USAF, had his F-86 flame out in the traffic pattern during the pitchout. He did not eject because he was over the populated area (Base Housing and offices) of Lowry AFB. He steered away and his aircraft clipped the chimney of the last house next to the field. He crashed and was killed." Had he ejected, he would have been saved... but the F-86 would have crashed in a populated area."

"I ejected from an F-100D on takeoff from England AFB, La and turned away from a big white house directly off the end of the runway....the (engine) compressor came to rest 75 feet from the back door. A woman was ironing in the kitchen." Gene Frank, Lt. Col. USAF (Ret)

"When I was in the RAG (Replacement Air Group) for the F-3H at Miramar Naval Air Station in 1961, a pilot had engine problems in the landing pattern. He had sufficient time and altitude to eject but because of the proximity of a grade school, he chose to ride it in and steer away from the school yard. No one was injured, but the pilot was killed." Frank Woods, Retired Naval Aviator.

"An F-102 crashed on North Ft. Lewis, WA. Pilot had a flameout and remembered a mile long parade ground at Ft, Lewis. As he approached the parade ground he saw troop formations on the field. He was dead stick, and no one on the ground was aware of his approach. He rolled to the left - too low and too late- and crashed the airplane behind barracks in an unpopulated wooded area." - Richard Noonan

On 29 JUN 72, Captain Steven L. Bennett, USAF, was hit by a SAM while strafing NVA regulars over running a friendly ground unit near Quang Tri. He chose not to eject because his USMC artillery spotter in the back seat had his parachute shredded by the shrapnel from the exploding SAM. Captain Bennett steered his crippled OV10 toward the nearby coastline so they could ditch at sea and hopefully get picked up by a rescue helicopter in the area. The ditching was successful, and the USMC spotter was rescued by the helicopter. Captain Bennett

was trapped and sank with the aircraft wreckage. Beyond the Wild Blue, Walter Boyne, page 401.