

## EXECUTIVE SUMMARY

### AIRCRAFT ACCIDENT INVESTIGATION

A-10A, S/N 81-0985

SPANGDAHLEM AIR BASE, GERMANY

22 NOVEMBER 1999

On 22 November 1999, at 1545L, a class A mishap occurred at Spangdahlem AB, Germany during landing roll-out of Boar-2, an A-10A, S/N 81-0985, assigned to the 52<sup>nd</sup> Fighter Wing, 81<sup>st</sup> Fighter Squadron, Spangdahlem AB. Boar-2 was #2 of a 2-ship of A-10s conducting local training. The mishap pilot (MP), 1<sup>st</sup> Lieutenant Nathan Connell, also assigned to the 81<sup>st</sup> Fighter Squadron, ejected safely as the mishap aircraft (MA) departed the prepared surface at the departure end of runway 23. He sustained only minor scraps and abrasions during ejection. The MP, a newly certified mission ready pilot, had 149 flight hours in the A-10 and 395 total flight hours. The mishap aircraft (MA) came to rest on the base golf course 340 feet beyond the end of the runway. The MA sustained substantial structural damage but is repairable. Damage was also caused to the Instrument Landing System (ILS) localizer antenna at the departure end of runway 23 and to the adjacent golf course. No civilian casualties or property damage were incurred.

The sortie was uneventful until the MP began his transition to land from a Precision Approach Radar (PAR). The MP broke out of the weather at around 1000 above ground level and 2 miles from touchdown. In his transition to a visual approach, he stated that he became distracted by blowing snow in the underrun of runway 23 and dipped well below glide slope. He then corrected to a normal glideslope as he approached the runway. The MP touched down on runway centerline approximately 1500-2000 feet down the runway, lowered the nose of the aircraft to the runway, deployed full speed brakes, and performed aerodynamic braking, but inadvertently failed to retard the throttles to idle. Although the MP originally testified that he had placed the throttles to idle, at no time during landing roll did he visually check to ensure the throttles were positioned to idle or that engine core RPM was at idle. Idle RPM for the conditions at the time of the accident would have been approximately 60%. However, the MA Turbine Engine Monitoring System (TEMS) data, downloaded after the mishap, confirms that the #1 (left) engine was running at 82.4% and the #2 (right) engine was running at 83.8% throughout the landing roll. Additionally, eye witness accounts substantiate that the engines were running at higher than idle power. With approximately 4800 feet of runway remaining and at a speed of about 100 knots the MP felt he was not decelerating normally (see airfield diagram following this summary). Consequently, the MP applied moderate to heavy brake pressure. With 2000 feet remaining and crossing the first departure end BAK-12 cable (arresting gear), he reported a slight fishtailing sensation. The MP stated that he came off the brakes at that time and then reapplied brakes using maximum pressure. Fishtailing stopped, however he felt the braking action insufficient to bring the aircraft to

a safe taxi speed in the remaining runway. He cycled the brakes once again approaching Taxiway A. The MP entered the runway overrun "standing on the brakes" and preparing to eject, as he felt unable to stop the aircraft within the remaining available overrun and that the terrain and obstructions off the end of the runway could possibly lead to aircraft break-up.

The MP successfully ejected at an airspeed of approximately 40 knots and with 300-400 feet of overrun remaining. With the MP no longer applying brake pressure, the advanced power setting of the engines caused the MA to accelerate to approximately 50 knots before departing the overrun surface. The MA continued off the end of the overrun and struck the northwestern most antenna of the ILS localizer antenna with the lower half of the left wing speedbrake. The MA traveled approximately 145 feet down a slope further accelerating to above 60 knots. The MA struck a drainage ditch and the shoulder of the perimeter road shearing off the nose wheel and collapsing the nose gear strut. The MA then bounced approximately 60 feet beyond the road at which point the aircraft nose dug into the ground. The MA slid another 135 feet before coming to a stop 340 feet beyond the end of the runway overrun.

As the MA aircraft began sliding, large quantities of mud and grass were thrown into the air. The engines ingested sufficient debris so as to cause the #1 engine to stall and flame out. At the time of the stall, TEMS data indicated that the MA speed was 59.9 knots and the engines had been running at 82.4% and 83.8% respectively for the previous one minute and 12 seconds. Based on the distance covered since touchdown and the MA's average speed during roll-out, this time correlates very closely to the actual time of aircraft touchdown. TEMS data also indicates that due to the throttle setting, fuel flow, and bleed air from the #2 engine, the #1 engine restarted following the flame out. This explains why the crash crew found both engines running at a high power setting when they arrived at the crash scene approximately 3 minutes later. The firefighter who shut down the engines stated that the throttles were set at mid-range and that he had to move them aft more than 3 inches to the idle stop before placing them to the cutoff (engine shut down) position.

MA system component tests reveal that all aircraft braking systems and throttle/engine controls were operating normally. Furthermore, 3 A-10A pilots who landed on the same runway within minutes before the MP had no difficulty stopping their aircraft before Taxiway B and experienced good braking action throughout their landing rolls. Crash recovery crews who drove on the runway immediately following the mishap experienced no difficulty in controlling/stopping their vehicles. These testimonies negate any possibility of unreported slick runway conditions. Moreover, simulator tests indicate that had the MP selected idle power at any time up until just after entering the overrun he could have prevented this accident.

The evidence clearly points to pilot error as the cause of this accident. During landing roll-out the mishap pilot failed to stop the aircraft before the end of the runway because he did not reduce the throttles to idle power, leaving them at a mid-range power setting. Subsequent braking efforts on his part were insufficient to overcome the elevated thrust

of the engines. Evidence shows that there was no substantiated aircraft system malfunction or environmental factor that caused this accident. The thorough analysis of various aircraft systems and AIB witness testimonies provide clear and convincing evidence that the MP made an uncharacteristic mistake that resulted in a departure from the prepared surface.

.Under 10 U.S.C. 2254(d), any opinion of the accident investigators as to the cause of, or the factors contributing to, the accident set forth in the accident investigation report may not be considered as evidence in any civil or criminal proceeding arising from an aircraft accident, nor may such information be considered an admission of liability by the United States or by any person referred to in those conclusions or statements.