

EXECUTIVE SUMMARY

ABBREVIATED AIRCRAFT ACCIDENT INVESTIGATION QRF-4C, T/N 65-0845, TYNDALL AIR FORCE BASE, FLORIDA 13 MAY 2011

On 13 May 2011, at 1751 Zulu (Z) time, the Mishap Drone (MD), a QRF-4C full-scale aerial target, tail number T/N 65-0845, drone designation AF-358, departed controlled flight and impacted the water approximately 16 nautical miles (nm) south of Tyndall Air Force Base, Florida. The MD was an asset of the 82d Aerial Targets Squadron, 53d Weapons Evaluation Group, Tyndall AFB, FL. There were no injuries, deaths, or reported non-government property damage as a result of the crash. The MD was destroyed with its loss valued at \$2,801,574.00.

The MD launched from Tyndall AFB at 1748Z to support a Weapons System Evaluation Program (WSEP) live fire mission. Shortly after take-off the MD experienced a BUS TIE OPEN electrical malfunction. After leveling off at 8,000 feet Mean Sea Level (MSL), the mishap controller (MC) cycled the MD's left generator. The MD experienced flight control transients in the pitch, roll, and yaw axes resulting in a nearly inverted unusual attitude. Cycling the left generator also caused an uncommanded Automatic Flight Control System (AFCS) switch from primary to backup. The split AFCS condition resulted in the MD only responding to Backup Automatic Flight Control System (BUAFCS) commands. Several other unusual failure indications including landing gear unsafe and arresting hook down were present.

The MC selected wings level (WL) and then All-Attitude Recovery (AAR) in an attempt to recover the MD to level flight. Once AAR was commanded, the MD began an increasing G pull, peaking at 4.8Gs, while rolling right towards a wings-level attitude. This resulted in rapidly decaying airspeed and increasing angle of attack (AoA). At 17:50:48, the MD experienced an accelerated stall and departure from controlled flight. From that point until water impact, the MD remained fully stalled at 29-30 units AoA. The MD experienced several post-stall gyrations including severe wing rock and four turn direction reversals.

The Accident Investigation Board (AIB) President determined, by clear and convincing evidence, the cause of the mishap was a power disruption in the MD's alternating current (AC) electrical power system which caused both Automatic Flight Control Computers (AFCCs) to restart in flight. The AIB President found, by a preponderance of evidence, that the MD's response to the AAR command was a substantially contributing factor to the mishap. The lack of AoA limiting in BUAFCS, aggravated by additional drag from the MD's landing gear, caused an accelerated stall which led to the MD's departure from controlled flight.

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