

EXECUTIVE SUMMARY

AIRCRAFT ACCIDENT INVESTIGATION MQ-1B, T/N 99-3061, KANDAHAR, AFGHANISTAN 3 JANUARY 2011

On 3 January 2011, at approximately 0605 zulu (Z) time, the mishap remotely piloted aircraft (MRPA), a MQ-1B Predator, tail number 99-3061, operated by the 15th Reconnaissance Squadron (RS) from Creech AFB, crashed west of Kandahar Air Base after completing 18 hours of tasked surveillance mission. The crash site was remote desert terrain. The MRPA's structure and mechanical components were destroyed as a result of the impact with terrain. There were no injuries and there was no damage to other government or private property.

After normal maintenance and pre-flight checks, the mishap remotely piloted aircraft (MRPA) taxied and departed from Kandahar Air Base at approximately 1204 zulu (Z) time on 2 Jan 11. At 0537Z on 3 Jan 11, the mishap crew (MC) lost satellite link with the MRPA after receiving a momentary alternator power warning. When the satellite link was re-established at 0539Z, the MC had indications that the alternators were off-line and that the MRPA was operating solely on back-up battery power. At 0603Z, approximately 30 minutes from the first alternator power warning, the MC lost satellite link permanently. The last known position of the MRPA was approximately 100 nautical miles (nm) west of Kandahar. The MRPA continued flying for some time after losing the satellite link when it exhausted back-up battery power and crashed southwest of its last known position.

The Abbreviated Accident Investigation Board (AAIB) President determined by clear and convincing evidence that the cause of the mishap was the failure of the front bearing in Alternator Number One (Alternator #1). As the front bearing failed, friction caused speed variations inside the Alternator #1 which triggered erratic bus voltage, alternator current and engine revolutions per minute (RPM). Due to voltage variations on the power bus, the Dual Alternator Regulator (DAR) performed an automatic rebalance of the alternators, switching between the two alternator output several times. With the DAR unable to tightly balance alternator output, a high voltage spike was sensed by both the DAR and PPDM, and the satellite link was severed. Because the alternator outputs are connected together and the DAR was unable to determine which alternator caused the event, it shut down both to protect the electrical system. When the link was re-established, the MC had indications that both alternators had failed and the MRPA was operating on back-up battery power. The MC realized that the MRPA would lose power before they could return to base or fly to an emergency divert, so they controlled the MRPA heading away from a known populated area. The MRPA continued flying for some time after losing the satellite link. As the battery voltage dropped, the MRPA electronics began to shutdown. The MRPA crashed and was destroyed when it impacted terrain. The estimated loss is valued at \$4.4M.

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 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.