

EXECUTIVE SUMMARY  
AIRCRAFT ACCIDENT INVESTIGATION  
RQ-1B "PREDATOR," S/N 96-3029  
AT A DEPLOYED LOCATION 1 JAN 2003

On 1 Jan 2003, at 0912 local, an RQ-1B, Predator, S/N 96-3029, experienced total loss of control while conducting a functional check flight at a deployed location in support of Operation ENDURING FREEDOM and impacted the terrain in the vicinity of the deployed airbase.

The mishap mission was planned as a functional check flight for a replaced engine. Approximately three and a half minutes into the flight, the mishap crew recognized an oil system malfunction, with the oil quantity indicator showing decreasing oil. The mishap pilot elected to return to base. Three minutes later, the engine malfunction became catastrophic, as the engine quit producing power. Visual observation from the sensor ball indicated that fluid or smoke was exiting from the air inlet scoops on the bottom of the aircraft. Over the next 3-5 minutes, the aircraft began uncommanded pitching, with the oscillations becoming more pronounced and the aircraft becoming more difficult to control. At approximately 13 minutes after take off, the sensor operator pointed the sensor ball aft a final time. As he did so, the aircraft performed an uncommanded barrel roll, and the sensor ball showed the left tail plane missing, and fire exiting the aircraft at that location. Moments later, the aircraft was destroyed upon impacting the ground in a grassy field in the vicinity of the airbase. The aircraft was damaged beyond economical repair, with the total loss valued at \$3,200,000.

The primary cause of this mishap was a total loss of engine oil, resulting in a seized engine and a fire fed by the oil as it leaked over the engine exhaust manifold. The fire affected the structural integrity of the left tail plane servomotor, which progressed to the point that the left tail plane departed the aircraft with resulting total loss of controllability. The loss of oil was caused by pieces of o-ring material lodged inside the engine crankcase. Two pieces of material restricted the flow of oil to the oil reservoir from the engine, allowing crankcase pressure to increase. Eventually, the crankcase pressure led to a failure of a hose, seal, or component, allowing the oil to drain from the engine.

A substantial contributing factor was inattention or complacency on the part of one or more maintenance technicians during a major engine inspection procedure. The pieces of o-rings were likely the result of inadvertently inserted o-rings during the maintenance procedure, or a result of improper technical procedures performed during the inspection.

*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.*