

MEMORANDUM REPORT

FROM: AFMC AFLCMC/EZJ - JCAT

SUBJECT: JCAT Assessment for N949CA Event - 29 April 2013; Bagram, Afghanistan

This report provides a brief introduction to the Joint Combat Assessment Team (JCAT) mission, training and activities in Afghanistan in the spring of 2013. Additionally, this report provides a summary of JCAT activities subsequent to the crash of a National Air Cargo 747 N949CA on 29 April 2013 at Bagram Air Field, Afghanistan.

The Joint Combat Assessment Team investigates aircraft battle damage and shoot downs to determine the threat weapon system(s) used in an attack and the enemy tactics, techniques and procedures employed which enables the Commander to determine the best counter-tactics to defeat the threat. Additionally, JCAT cooperates with the acquisition and test community and the Defense Systems Information Analysis Center to share lessons learned, archive combat damage data, and improve aircraft survivability. The Joint Combat Assessment Team employs military forensic specialists that conduct on-scene assessments of incidents and aircraft damage to determine the extent and impact of weapons effects on both military and civilian aircraft of interest to military commanders. For events in which weapons employment is initially uncertain, the Joint Combat Assessment Team will conduct an investigation in parallel with any ongoing aircraft mishap investigation until weapons effects can be ruled out as a cause of the event.

On 29 April 2013, two Air Force JCAT assessors, Lt Col Chad Ryther and Capt Gary Roos, observed aircraft N949CA climbing out from Bagram Air Field, Afghanistan. Both assessors heard what they described as “normal heavy aircraft engine takeoff sounds” and turned to observe the takeoff. Neither the runway nor the aircraft were immediately in the view of Lt Col Ryther or Capt Roos as they were standing approximately 1500 feet west of the runway, roughly abeam midfield and their view was blocked by a small structure. Lt Col Ryther and Capt Roos visually acquired the aircraft as it climbed through approximately 200 feet AGL and paused to watch the takeoff. Initially, neither assessor observed anything unusual about the aircraft. After 2-3 seconds, Lt Col Ryther commented that the aircraft pitch attitude was “really aggressive.” Both assessors continued to observe the aircraft and noted that the pitch attitude continued to increase as the aircraft climbed. Lt Col Ryther commented “he’s going to stall.” Approximately 2 seconds later, both assessors observed the aircraft bank 30-40 degrees left while at an apparent 30 degree nose high attitude. Then, the aircraft banked 40-45 degrees right and began a 90-100 degree yaw to the right. Both assessors reported that the aircraft bank appeared to level out as it descended nearly vertically in a slightly nose down attitude until it disappeared behind the same structure that had blocked their view of the initial portion of the takeoff. Approximately one second after the aircraft disappeared from view, a large fireball and cloud of smoke were observed from where Lt Col Ryther and Capt Roos presumed the aircraft had crashed. Several seconds later, the JCAT team heard the aircraft explosion. Both JCAT assessors then ran about 100 meters to the local Air Force Flight Safety office to report the crash.

During the initial climb out, both JCAT assessors were positioned such that they were able to directly observe the left side of the aircraft. As the takeoff progressed and the aircraft climbed

and continued north, Lt Col Ryther and Capt Roos had an unobstructed view of the left rear quadrant of the aircraft. The tops of both wings were visible due to the pitch attitude of the aircraft. The right side of the aircraft became visible to Lt Col Ryther and Capt Roos as the aircraft yawed to the right.

Throughout the entire event engine sounds were reported to be “normal.” Prior to impact, no structural damage was observed to any portion of the aircraft by either JCAT assessor. Additionally, no fire, smoke or sooting was observed during the flight by Lt Col Ryther or Capt Roos.

Throughout the flight, weather conditions were observed by the JCAT team to be overcast with light winds from the north. No precipitation was observed until after the crash. No visual or acoustic signatures of weapons employment of any sort were observed by Lt Col Ryther or Capt Roos at any time during the flight or at any time before or after the event on 29 April 2013. Prior to this event, Lt Col Ryther had experience with and had personally observed multiple instances of actual enemy small arms, heavy machine gun, rocket-propelled grenade and rocket artillery employment. Capt Roos had recently arrived at Bagram and had not yet directly observed a hostile weapons employment.

Both assessors had completed JCAT assessor qualification training which included extensive training in identifying the visual, acoustic and other employment signatures of the full spectrum of weapons known to be employed against aircraft. At the time of the event, Lt Col Ryther was on his second JCAT deployment and was serving as the Joint Combat Assessment Team Theater Lead and had participated in over 120 aircraft combat damage assessments including multiple catastrophic events. Capt Roos had recently arrived to start his first JCAT deployment and had already participated in two real world assessments.

After reporting the crash, Lt Col Ryther and Capt Roos met with Air Force Flight Safety and traveled to the crash site to conduct an initial assessment of the debris field. Upon arrival to the crash site, portions of the aircraft and cargo were still on fire and personnel recovery efforts were underway. Over the next three hours, the JCAT team performed an initial assessment of the wreckage to determine if there were any indications of weapons effects. All four engines and the auxiliary power unit (APU) were located and examined along with the empennage, cockpit and wings. Lt Col Ryther identified the flight recorder in the debris field near other debris from the aft portion of the fuselage. The location of the flight recorder was communicated to Flight Safety and left undisturbed in-situ. During this initial assessment, the JCAT team did not observe any weapons effects. Assessment efforts were discontinued due to nightfall and deteriorating weather.

Analysis of a small amount of aircraft debris (tubing and aluminum structural components later determined to be part of the mishap aircraft) discovered in a secondary debris field on the portion of the runway traversed by N949CA during the takeoff roll indicated no obvious weapons effects. Later, JCAT assessors assisted the NTSB in submitting that debris to the Bagram ACME Chemistry Lab for chemical and explosive residue testing. No explosive residue or exploitable materials were detected.

Based on the aircraft fragments discovered in the small, secondary debris field on the southern half of the Bagram Air Field runway, the JCAT assessment team tentatively identified that location and the initial portion of the takeoff roll as the likely initiation point for the event. Combining evidence that the aircraft was still on the runway during the initiation of the event with the known weapon engagement zones for potential threat weapons, the JCAT assessors were able to rule out several classes of anti-aircraft weapons to include anti-aircraft artillery, man-portable air-defense systems (MANPADS) and other surface-to-air missiles. Furthermore, no indirect fire events such as rocket artillery were reported anywhere on Bagram near the time of the event. The only remaining potential threat weapons included small arms, heavy machine guns or rocket-propelled grenades. Analysis of the known weapons engagement zones of these weapons indicated that any potential employment of these types of weapons against an aircraft on the Bagram runway would have had to have occurred from inside the secure portion of the base. The JCAT assessment is that it is not feasible that a discharge from a small arms or heavy machine gun type weapon or the launch of a rocket-propelled grenade would go unnoticed at any time on Bagram let alone during the middle of a relatively calm day. No such weapons activity was reported on Bagram on 29 April 2013. Based on this analysis, the initial survey of the primary debris field and a complete lack of any evidence of weapons effects, the Joint Combat Assessment Team suspended their investigation in favor of the ongoing AF safety investigation. Air Force Flight Safety later notified JCAT that they were suspending their mishap investigation pending the arrival of National Transportation and Safety Board investigators.

When the NTSB team arrived at Bagram, the JCAT assessors provided the investigators a complete walk through of their activities to date. All factual data collected by the JCAT team such as photographs of the debris field were provided to the NTSB investigators.

On 11-12 May 2013, at the request of the NTSB, JCAT Team members Lt Col Chad Ryther, Capt Gary Roos and Capt Richard Lanser conducted a second detailed physical examination of the aircraft wreckage located in the primary debris field and the small amount of wreckage that had been discovered on the runway. During this time, the JCAT team carefully examined all portions of the aircraft and cargo except the cockpit and the portion of the forward fuselage immediately below the cockpit since this portion of the aircraft had, in the intervening days, been bulldozed into a large pile to clear debris from a critical access road. Damage observed to the aircraft aft pressure bulkhead was determined to be not consistent with weapons effects. In addition, all cargo hardware such as straps, attach points, chains and pallet components found in the debris field were examined in detail and yielded no evidence of weapons effects.

As with Lt Col Ryther and Capt Roos, Capt Lanser had also completed JCAT assessor qualification training. At the time of this assessment, Capt Lanser was on his second JCAT deployment and was serving as the Joint Combat Assessment Team - Regional Command South Assessor and had participated in over 90 aircraft combat damage assessments including multiple catastrophic events.

At no time did the JCAT team observe any indications of weapons effects on any portion of the aircraft. Additionally, a JCAT review of numerous witness statements and two videos of the incident indicated no evidence of weapons employment prior to, during or after the event. The final JCAT assessment was that there was absolutely no evidence that any sort of weapon was

employed against aircraft N949CA at any time prior to, during or after the event on 29 April 2013. On 12 May 2013, the JCAT assessment team provided this information to the NTSB investigators and concluded their assessment.

The POC for this report is Lt Col Chad Ryther, [REDACTED].

CHAD E. RYTHER, Lt Col, USAF
Joint Combat Assessment Team