PARTY SUBMISSION OF
QUEST DIAGNOSTICS INCORPORATED

To the National Transportation Safety Board

December 17, 2010

Regarding the Accident Involving
Beech 58, N167TB

Teterboro, New Jersey
August 21, 2009

NTSB# ERA09LA469

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I. INTRODUCTION

Pursuant to 49 C.F.R. §831.14, Quest Diagnostics Incorporated ("Quest Diagnositics") respectfully submits this response to the November 22, 2010 Factual Investigation Report (NTSB ID: ERA09LA469) ("Report") authored by the investigator in charge ("IIC"), Brian C. Rayner. The IIC's Report has two main sections. The first discusses facts relating to the accident itself (pp. 1-1c), and the second discusses other, non-accident-related aspects of Quest Diagnostics' flight operations (pp. 1c-1h). This Response follows the Report's order of presentation, first addressing probable cause for the accident and then turning to the non-accident-related matters. Consistent with 49 C.F.R §831.14, this Response concludes with safety recommendations.

II. BACKGROUND

Quest Diagnostics provides a comprehensive set of routine and specialty medical testing services for patients and doctors, as well as laboratory services in support of clinical research trials for new drugs. As part of this work, Quest Diagnostics flies medical specimens to laboratories for testing. From time to time, Quest Diagnostics also uses its aircraft to transport executives. Quest Diagnostics conducts its flight operations pursuant to 14 C.F.R. Part 91.

On August 21, 2009, at approximately 0305 Eastern Daylight Time, one of Quest Diagnostics' aircraft, a Hawker Beechcraft Model 58 ("Beech 58"), crashed during an attempted landing at Teterboro Airport in Teterboro, New Jersey. The co-pilot, who was at the controls during the initial approach to Teterboro, and the captain were both injured in the crash. The co-pilot survived his injuries, but the captain died two weeks later.

Within hours of the crash, Quest Diagnostics provided the FAA with the subject aircraft's maintenance records and the investigation was under way. Quest Diagnostics was not invited to participate in the investigation as a party representative until September 23, 2010. The IIC provided Quest Diagnostics' party representatives a draft report soon thereafter. On October 10, 2010, the party representatives pointed out a number of errors in the report, but these were not corrected in the Report filed publicly on November 22, 2010. On November 30, 2010, the IIC gave Quest Diagnostics until December 10, 2010 to submit a written response. The IIC initially denied Quest Diagnostics' request for more time to respond. On December 1, 2010, the IIC informed Quest Diagnostics that he would be making corrections to the Report, but it appears that corrections were not made. On December 9, 2010, the IIC extended the time for Quest's response until December 17, 2010. Given the short time in which Quest Diagnostics had to respond, this Response is not exhaustive.

III. OPERATION OF ACCIDENT AIRCRAFT ON AUGUST 21, 2009

On August 21, 2009, at approximately 0305 EDT, a Beech 58, N167TB, operated by Quest Diagnostics Inc., was destroyed after a collision with the terrain and a post-crash fire during an aborted landing at Teterboro Airport (TEB), New Jersey. The captain and co-pilot were seriously injured. On September 4, 2009, the captain died from his injuries. Visual meteorological conditions prevailed for the cargo flight that originated at Pottstown Limerick Airport (PTW), Pennsylvania, at 0252 EDT, and was destined for TEB. A company flight plan was filed for the flight, which was conducted under the provisions of 14 C.F.R. Part 91.

Information from the Federal Aviation Administration ("FAA") revealed that Air Traffic Control ("ATC") cleared the aircraft for a visual approach to Runway 01, a grooved asphalt runway that was 7,000 feet long and 150 feet wide. The runway was equipped with high-intensity runway edge lighting and had Visual Approach Slope Indicator ("VASI") guidance.

Radar data depicted the airplane as it approached from the west on an extended left base for Runway 01, at 1,400 feet MSL and 204 knots ground speed. The airplane maintained 204 knots and descended to 1,300 feet MSL within one mile of the airport before it turned north toward the airport. The airplane overshot the runway extended centerline and at 600 feet MSL and ½ mile from the airport, the airplane's ground speed was 178 knots.

The airplane crossed the runway threshold at 300 feet MSL, 186 knots ground speed, and was depicted over the center of the airport at 100 feet MSL and 160 knots. Witnesses said that the airplane flew the length of the runway at low altitude before it overshot the departure end, departed airport property, struck a sign and a tree, and began to burn.

ATC reported that all communications with the airplane were routine, that no emergency was declared by the crew, and that no communications were received from the accident aircraft after it was cleared to land.

According to FAA and maintenance records, the aircraft was manufactured in 1999, and its most recent annual inspection was completed May 24, 2009, at 3,131.7 total aircraft hours.

Post-accident investigation revealed that both propellers were in a position consistent with the "feathered" position at the time of impact, that the landing gear actuator/motor revealed a position consistent with the down-and-locked position, and the flap actuators were in a position consistent with the "approach" position at the time of impact. All damage was due to impact forces and there were no mechanical anomalies noted during post-crash teardown and testing.

As the airplane approached TEB, it was in visual meteorological conditions on an extended left base for landing on Runway 01. According to the co-pilot, who had 1,575 total hours of flight experience, including 607 in the accident airplane make and model, he was flying the airplane from the left seat as the captain pointed out several visual checkpoints, talked about noise abatement, and placed special emphasis on "the Meadowlands (Giant Stadium)".[1] The co-pilot said that he advised the captain that he, the co-pilot, "had better slow down," the co-pilot then said that he "brought the power down, [] made a left turn, and [the captain] freaks out. 'What have you done? You've lost both of your engines!'" The captain repeated himself "four times."

The co-pilot described "dive bombing" for the runway, discussing whether to notify ATC, attempting engine restarts, and fighting on the controls with the captain. At no time did he describe calling for a before-landing checklist, exchanging call-and-response items with the captain, or configuring the airplane for landing.[2]

On August 27, 2009, the Quest Diagnostics Director of Logistics ("DOL") flew one of the company Beech 58s on the same approach profile as the accident aircraft, using a starting airspeed of 180 knots at 1,400 feet MSL and 2.5 miles from the airport, instead of the accident aircraft's 204 knots. On two separate approaches, the aircraft could not be slowed enough to reach either placarded gear extension or flap extension speed, and a missed approach was required as the aircraft was too high and too fast to land on the available runway. Thus, the proper course of action for the accident aircraft at 1,400 feet MSL, 204 knots and 2.5 miles from the airport – or at any point inside of these parameters – was to abort the landing and go around for another try. This course of action was rendered impossible by the co-pilot's apparently mistaken feathering of the propellers.

IV. PROBABLE CAUSE

The probable cause of this accident was the actions of the co-pilot, who inadvertently feathered the propellers when he probably meant to retard the throttles while attempting to decrease airspeed as the aircraft approached the airport. When the captain subsequently attempted to take control of the aircraft, the co-pilot did not immediately relinquish the flight controls, compounding the emergency. Given the

[1] The co-pilot's training records indicate that he had received the training required by Quest Diagnostics' Flight Operations Manual ("FOM") Section 7, and his evaluations (18 in total, including two by the deceased captain) indicate that he met Quest Diagnostics' qualification standards for co-pilots. *See* FOM, Attachment 1.

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[2] The events recounted here are based on the co-pilot's statements to FAA investigators in a taped interview shortly after the crash and to the IIC over the telephone on October 19, 2009. On May 11, 2010 – almost nine months after the crash – attorneys retained by the co-pilot contacted the IIC to advise that the co-pilot had recanted. The next day, the attorneys submitted a written statement from the co-pilot in which he even denied that he was flying the aircraft as it attempted to land.

altitude, airspeed, and proximity to the airport at which these events took place, a landing on Runway 01 was not possible. The aircraft flew down the length of Runway 01, overshot it, lost airspeed, stalled, and crashed beyond the runway's departure end.

The co-pilot's likely unintended feathering is confirmed by his hospital room statements to the FAA aviation safety inspectors investigating the cause of this crash. Quest Diagnostics' Director of Logistics was at this interview and recalls the co-pilot saying that as he was attempting to slow the aircraft, he was pulling a lever back and anticipating a click.[3] The co-pilot went on to state that when he felt a click he knew where he was with the throttle. A tactile click, however, is not characteristic of the throttle lever on this aircraft. In fact, the only throttle quadrant lever exhibiting this tactile click is the propeller lever before it goes into full feather. Accordingly, it appears that the co-pilot unwittingly fully feathered both propellers by pulling the propeller levers when he had intended to throttle back. This explains why the propellers were fully feathered, why the aircraft speed did not slow (despite the fact that the landing gear was deployed and flaps down), and why the co-pilot later claimed he did not feather the propellers.

V. RESPONSE TO NON-ACCIDENT-RELATED MATTERS DISCUSSED IN THE REPORT

Though the accident occurred in August 2009, and the authorities began their investigation immediately thereafter, Quest Diagnostics was not invited to participate as a party representative until September 2010, more than a year later. Less than a month after Quest Diagnostics' participation began, the IIC circulated a draft report for comment. Quest Diagnostics provided comments to the draft that were intended to correct a number of factual errors. Most of these comments were ignored and these errors remained in the next version of the Report. Unfortunately, the IIC's Report still includes a number of factual errors and/or omissions on matters wholly unrelated to the accident. Some of these are addressed below:

- The Report raises questions about Quest Diagnostics' safety practices based on interviews with a small sample (only eight, including the co-pilot) of current and former Quest Diagnostics employees. In fact, the Report relies most heavily on the comments of two disgruntled former employees.

  A broader review of available data, by contrast, demonstrates the high importance the company places on safe air operations. The Company, for example, maintains an independent "Hot Line" where all employees are encouraged to report anonymously any compliance, legal, safety, quality, or human resource issues. Such issues are investigated, reported out, and are reflected in summary reports to the Board of Directors of the corporation. Over the past three years, there have been no calls to the "Hot Line" related in any respect to aviation safety. In addition, Quest Diagnostics retains an independent, outside consultant to conduct an annual anonymous survey. For the survey

[3] The NTSB has an audio tape of this interview.

completed in Fall 2008, 82% of responding pilots rated the overall safety of their work area positively and indicated that employees take personal responsibility for following established safety rules and procedures. For the survey completed in Fall 2009 (pilots were not culled out separately), 93% of responding flight operations employees expressed a positive view of overall safety and 100% indicated that employees take personal responsibility for following established safety rules and procedures. These results give a more complete picture of Quest Diagnostics' employee views regarding the company's safety culture than does the Report.

What is more, Quest Diagnostics' flight operations are governed by 14 C.F.R. Part 91 and there is no indication that Quest Diagnostics' has, at any time, been in violation of the relevant regulations. In addition, Quest Diagnostics has a well-established FOM, which provides that "Quest Diagnostics Flight Operations written policies and procedures act in conjunction with an established Safety Management System to promote our safety goals…. All levels of corporate management, without exception, are held responsible and accountable for Quest Diagnostics Flight Operations' safety performance; beginning with the Chief Executive Officer." FOM at END-i. The FOM further provides that the final authority regarding safety rests with the pilot in command. *Id*. at END-ii. There is no evidence of any pilot's being disciplined for refusing to fly an aircraft due to a maintenance issue or for refusing to engage in an unsafe act. Significantly, the Report does not implicate any aspect of maintenance in the August 21, 2009 crash. In fact, the investigation shows that Quest Diagnostics' aircraft maintenance is excellent. (Report at 1d).

Instead of relying on these broader safety indicators, the interviews of former employees William Welch and Chris Andreychik appear to have "set the course" for the Report. Their statements, however, should be weighed against the fact that they have shown themselves to be unhappy with Quest Diagnostics for reasons related to their respective separations from the company and the fact that each has a history of personal antagonism toward Quest Diagnostics' Director of Logistics. These facts – in addition to the anonymous Hot Line, the survey results, and the maintenance performance described above – should be kept in mind when weighing their comments.

- The Report states that some persons had reported being overcome by carbon dioxide prior to engine start, during takeoff, as well as in flight, and that Quest Diagnostics airplanes were commonly loaded and then operated with 68% more dry ice on board than recommended by FAA. Report at 1f. The Report fails to note, however, that there is no indication that dry ice or carbon dioxide played a role in the accident. Among other things, the flight was less than one third loaded and carried only one bag containing dry ice. And nothing in the record indicates that either the captain or co-pilot experienced any signs of being exposed to excess carbon dioxide.

Furthermore, the Report contains no support for the IIC's conclusion that Quest Diagnostics airplanes were commonly loaded and then operated with 68% more dry ice on board than recommended by FAA, and the assumptions that lead to that conclusion are not specified. To the extent it is based on FAA's report titled, "Dry Ice Carried on board a Quest Diagnostics Beech Baron Model 58 Aircraft," the premises for the conclusion are faulty. First, the FAA dry ice report states that a Beech 58 has a cabin volume of 59 cubic feet. According to the manufacturer's website, this is incorrect, as such aircraft actually have a cabin volume of 137 cubic feet. Second, the FAA dry ice report appears to assume no complete cabin air changes, which is simply unrealistic. Boeing, for example, has estimated that a Boeing 767 experiences 20 to 30 cabin air changes per hour and that most aircraft can expect 10 to 15 cabin air changes per hour. Assuming "no complete cabin air changes," as does the FAA dry ice report, necessarily results in an allowable dry ice limit of zero. Moreover, that report's implication that Quest Diagnostics' Beech 58s commonly have an atmosphere with 29.8% carbon dioxide is impossible – concentrations of 10 to 15% result in unconsciousness.[4] Third, the FAA dry ice report appears to assume 14 to 21 packages, each with as much as 5 lbs. of dry ice, and as much as 105 lbs. of total dry ice per flight. Quest Diagnostics has studied representative flights of its Beech 58s and in none of the flights was there more than nine bags of dry ice. In fact, the studied flights averaged less than three bags of dry ice per leg. Even with nine bags at 5 lbs. per bag, that would be just 45 lbs. of dry ice. Assuming a sublimation rate of 2%, a cabin volume of 137 cubic feet, and 15 air changes per hour, the allowable amount of dry ice is 58.3 lbs.

The Report also ignores the fact that Quest Diagnostics has multiple training formats designed in precise accord with the most critical FAA recommendations regarding the issue of carbon dioxide. This includes training, written guidance, and quizzes that all pilots are required complete as part of their safety training. As reflected in safety-related meeting minutes that are part of the public docket, Quest Diagnostics emphasizes the importance of proper ventilation, as well as the responsibility of the pilot in charge to ensure that supplemental oxygen is operational and at the ready. The Report also ignores the fact that Quest Diagnostics does not rely on "rules of thumb" when determining the safe amount of dry ice that can be transported. Instead, Quest Diagnostics has conducted direct testing to ensure safety, including the use of carbon dioxide meters and Drager Tubes. This testing, which was conducted in 2006 and is referred to in Quest Diagnostics training documents available on the NTSB Docket, indicated that, with one exception, pilots of Beech 58s were exposed to carbon dioxide levels far below FAA standards (5000 ppm).[5]

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[4] It also should be noted that the vast majority of Quest Diagnostics' flights are less than one hour in duration, after which the cabin and cargo areas are completely vented.

[5] The sole exception was determined to have occurred because the test subject placed the tube on his person in close proximity to their exhaled breath.

- The Report claims that current and former pilots reported specimen bags being loaded well above the prescribed 5 lb. dry ice limit, and well above the 12 lb. total weight limit. There is, however, no 12 lb. weight limit for specimen bags – that is Quest Diagnostics' average bag weight, which has been tested on several occasions. Quest Diagnostics' packaging SOP limits the weight of individual bags to 20 lbs. to minimize potential lifting injuries.

- The Report asserts that supplemental oxygen bottles in the Beech 58 were difficult to reach. Report at 1g. The Report fails to note, however, that the supplemental oxygen is stored behind the co-pilot's seat and is easily accessible since the seats flip forward, and the vast majority of flights have just one pilot aboard.

- The Report suggests that pilots were instructed to "wait until they are overcome" by carbon dioxide emissions before deploying the oxygen. Report at 1g. This is contradicted by the fact that Quest Diagnostics training materials provide that a pilot should use supplemental oxygen immediately if a pilot feels that he or she is beginning to experience any of the warning signs that carbon dioxide levels are too high. These training materials are consistent with the FOM, which mandates supplemental oxygen use "[a]t the first sign of CO2 poisoning…." FOM 13-10.

- The Report claims that Quest Diagnostics provides written guidance for the use of supplemental oxygen in pressurized airplanes only. Report at 1g. This is incorrect. FOM at 13-10 to 13-11.

- The Report states that there was one exit out of a Quest Diagnostics' Beech 58 because the aft exits were blocked by a cargo net and by the cargo, which often filled the entire space aft of the pilot seats. Report at 1b. The Report fails to note that this modification was approved by the FAA in a field approval process. In addition, this fact played no role in the accident in question, and both pilots exited the aircraft.

- The Report asserts that Quest Diagnostics captains tasked with auditioning and training part-time, contract pilots may or may not possess a flight instructor certificate, or if they did, the certificates may or may not be current. Report at 1e. In fact, all Quest Diagnostics captains are required to be ATP rated and relevant regulations provide that "[a]n airline transport pilot may instruct other pilots in air transportation service in aircraft of the category, class, and type, as applicable, for which the airline transport pilot is rated and endorse the logbook or other training record of the person to whom training has been given." 14 CFR 61.167(b)(1); FOM at 7-1 (requiring that all pilots in charge possess an ATP certificate with appropriate category, class, and type ratings).

- The Report suggests that Quest Diagnostics' aviation employees are not trained to implement the company's Emergency Response Plan ("ERP"). Report at 1f. This is incorrect. Training regarding the implementation of the ERP is provided to all Quest Diagnostics flight operations employees during the scheduled bi-annual FOM training. Quest Diagnostics' last training cycle was completed between July

and August 2010. The plan is reviewed and amended as needed by Quest Diagnostics' Safety Committee.

VI. SAFETY RECOMMENDATIONS

Quest Diagnostics is committed to running a safe Part 91 operation. In furtherance of this goal, Quest Diagnostics had the Flight Safety Foundation conduct an audit in 2004 and the IS-BAO conduct another in 2008. Yet another audit is scheduled for February 2011, and the auditors will be provided the Report and this Response so that the matters discussed here can be assessed during the course of that audit. In addition, there is an active Safety Committee in the Flight Operations department that involves a broad reach of pilots, maintenance personnel, and management, and is chaired by the Flight Safety Officer. The Corporate Director, Environmental, Health and Safety, acts as an advisor to this committee.

As part of its ongoing efforts to improve safety, and in response to statements made in the Report, Quest Diagnostics already has taken a closer look at its use of supplemental oxygen. All Quest Diagnostics pressurized aircraft are fitted with aviation-grade oxygen. The Report states, however, that the supplemental oxygen placed on board Beech 58s, a lower-flying and non-pressurized aircraft, is medical-grade oxygen, and not aviation-grade oxygen. Report at 1f-1g. Quest Diagnostics initially believed that this assertion was wholly incorrect because our vendor had assured us that all oxygen supplied to us was aviation grade. The oxygen containers provided on Quest Diagnostics Beech 58's were purchased in 2003 as an added precaution to guard against the potential dangers of carbon dioxide poisoning that can be associated with the sublimation of dry ice. This is not, of course, the reason that high-flying, pressurized aircraft typically require aviation-grade oxygen, and aviation-grade oxygen is not required on low-flying, non-pressurized aircraft such as the Beech 58. Quest Diagnostics took this step even though carbon dioxide poisoning has not been an issue in its Beech 58s and continued to stock the oxygen even after 2006 Drager tube testing established that carbon dioxide levels in its Beech 58s were far below FAA standards. Though the Beech 58 oxygen bottles are fitted with labeling that implies the oxygen is medical in nature, Quest Diagnostics has serviced these bottles with aviation-grade oxygen for years. Additional investigation, however, established that the Report was not entirely incorrect with respect to its statement regarding medical-grade oxygen. The oxygen bottles must undergo hydrostatic testing every six years and Quest Diagnostics has determined that its vendor re-filled bottles with what the vendor refers to as medical-grade oxygen following that testing. Quest Diagnostics, however, also has been informed by its vendor that the oxygen the vendor used to re-fill the bottles after the hydrostatic testing actually meets the minimum specifications required of aviation-grade oxygen. Though nothing in the record indicates that supplemental oxygen played any role whatsoever in the accident, Quest Diagnostics is taking steps to ensure that the Beech 58 oxygen bottles are clearly labeled for aviation-grade oxygen, that all bottles currently aboard are filled with aviation-grade oxygen, and that any future servicing of the bottles, including that done by its vendor following hydrostatic testing, is done with aviation-grade oxygen.