NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D.C. 20594

March 17, 2010

Technical Review Errata Sheet rev 1

A. ACCIDENT:

NTSB Accident Number:	DCA09MA021
Location:	Denver, Colorado
Date:	December 20, 2008
Aircraft:	Continental Airlines flight 1404

B. Purpose of Errata

Per NTSB Board Order 300, a Technical Review of reports and items in the public docket was held on December 8, 2009. Parties to the investigation provided corrections and suggestions of an editorial nature, or minor corrections that would not change the sense of the reports. These corrections are compiled in this document. More substantive changes are included in specific amendments as appropriate.

C. Factual Docket Corrections

All Factual Reports

Correct all references to engine manufacturer as "GE" to "CFM."

Replace summary paragraph in all factual reports with the following:

On December 20, 2008, at 1818 mountain standard time, Continental flight 1404, a Boeing 737-500 (registration N18611), equipped with CFM56-3B1 engines, departed the left side of runway 34R during takeoff from Denver International Airport (DEN). The scheduled, domestic passenger flight, operated under the provisions of Title 14 CFR Part 121, was enroute to George Bush Intercontinental Airport (IAH), Houston, Texas. The airplane was substantially damaged and experienced post-crash fire. The special weather observation taken at 1834 reported winds at 290 and 24 knots with gusts to 32 knots, visibility of 10 miles, a few clouds at 4000 feet and scattered clouds at 10,000 feet. The temperature was reported as -4 degrees Celsius.

Operations Factual

Make the following deletion (strikethrough text) and addition (underlined text) in paragraph 2 of section *1.18.1.1.1. Accident at Guadalajara on September 16, 1998.* The reason for the change is as follows: The original quotation contained text from an outside

news source that was merely appended in the notes section of the database entry. The newly inserted material shown below is Continental Airlines' own summary of known factual information related to the accident, and it was contained in the same database entry.

> ~~The aircraft departed the left side of the runway while landing in heavy rain and winds. The aircraft that landed just before the Continental flight had also departed the left side of the runway momentarily, but the pilot was able to regain control. The nose gear collapsed as the aircraft departed the runway, causing serious structural damage. Crew error in attempting to land in crosswinds beyond the aircraft's capability.~~ ATC held A/C high on first approach resulting in crew being unable to descend for a stabilized approach. On second approach encountered broken clouds with light to almost moderate rain showers and winds steady with a right crosswind resulting in 3-4 degrees of crab. Crew recalls winds as steady from 50 degrees right of the nose at 15kts. ATC reportedly gave winds just before landing that were 80 degrees right of the nose at 10kts gusting to 40kts. The crew did not recall hearing the gusts to 40. On touchdown the A/C immediately drifted left of center and would not respond to control inputs. The A/C exited the runway to the left coming to rest approximately 6,000 feet from the threshold. Slides were deployed and an orderly evacuation was conducted without injuries.

Change Table 1 (page 9) to:

Flight Time	**Flight Hours**
Total	13,100
B-737	6,300
B-737 PIC	1,015
Last 12 months	915
Last 90 days	216
Last 30 days	81
Last 7 days	17:39
Last 24 hours	3:43

and Table 6 (page 12) to:

Flight Time	**Flight Hours**
Total	7,500
B-737	1,500
B-737 SIC	1,500
Last 12 months	918
Last 30 days	34
Last 7 days	17:39
Last 24 hours	3:43

Maintenance Records Report

Change section 10 to read as follows:

10.0 Weight and Balance Summary

Per the Continental Maintenance Program, the airplanes are to be weighed every thirty-six (36) calendar months. The last documented weight and balance job per Continental Maintenance Program was performed on April 7, 2006 by Continental Airlines, IAH maintenance.

Basic Empty Weight:	69,153 pounds
Arm:	650.20 inches
Moment:	44,962,918 inch-pounds

Operating Empty Weight:	72,485 pounds
Arm:	650.99 inches
Moment:	47,186,991 inch-pounds

The last weight and balance calculation prior to the accident was performed on November 29, 2008 after winglet installation.

Basic Empty Weight:	69,668 pounds
Arm:	652.29 inches
Moment:	45,443,655 inch-pounds

Operating Empty Weight:	73,000 pounds
Arm:	652.98 inches
Moment:	47,667,728 inch-pounds

See Attachment E for additional information.

Survival Factors Factual

Page 29, correct sentence “Airport operations conducted a runway friction test at 1921 MST” to read time 1821.

Optical Quick Access Recorder Specialist’s Report

Page 2 Section 2.1 Recorder Description 2nd Paragraph, change to:

This model QAR is an optical QAR (OQAR) which records airplane flight information in a digital format using magneto-optical disk media as the recording medium. The OQAR can receive data in the ARINC 573/717/747 configurations and can be configured to record 64/128/256/384/512/1024 12-bit words of digital information every second. Each grouping of words (each second) is called a subframe. Each subframe has a unique 12-bit synchronization (sync) word identifying it as subframe 1, 2, 3, or 4. The sync word is the first word in each subframe. The data stream is "in sync" when successive sync words appear at the configured word intervals. Each data parameter (for example, altitude, heading, airspeed) has a specifically assigned word number within the subframe.

Page 2 Section 2.1 Recorder Description 3rd paragraph, change to:

The OQAR creates individual files for each flight cycle (for example, first engine start through last engine shutdown) and the OQAR data is continuously recorded throughout the flight cycle. However, gaps of missing data are common and can be attributed to temperature and vibration that affect the magneto-optical drive.

Page 2 Section 2.1 Recorder Description 4th paragraph, change to:

The OQAR is configured to record 128 words per second where the first 64 words are the same 64 words as recorded by the flight data recorder (FDR) and the second set of 64 words were added to make a 128 word per second recording which allows for additional QAR parameters. The first 64 words are synchronized to the FDR words and have the same 12 bit format and will accommodate the same parameter conversions as the FDR. However, since the OQAR records a total of 128 words per second and the FDR records 64 words per second, the decimal values (timing) for the OQAR's first 64 words are twice as small when compared to the FDR's 64 words. For example, ground speed is located in word 12 for both the OQAR and the FDR. The decimal value is determined by dividing the word location minus one by the total words per second. Therefore, the ground speed decimal value for the OQAR and the FDR is 0.0859375 (11/128) and 0.171875 (11/64), respectively.

Page 3 Last paragraph in Section 2.3 Time Correlation, change to:

After lining up the ground speed and the heading from both the OQAR and the FDR, it was determined that the OQAR was missing 8 seconds of data during the beginning of the take-off roll (see Plot 1). In order to accommodate the 8 seconds of missing data, an 8-second blank segment was manually added to the OQAR data. Additionally, the OQAR data ended 22 seconds before the FDR ended which is expected when power is removed from the QAR before the buffered data is written to the optical disk.

Cockpit Voice Recorder Specialist's Report

Page 12-35, amend as follows:

18:16:16
CAM-? [what are the winds?] *locate on the left side of the CVR transcript under intra-cockpit communications column.*

NO MORE FOLLOWS