

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, DC 20594

January 24, 2011

Cockpit Voice Recorder

Specialist's Factual Report

By Bill Tuccio

1. EVENT

Location: Longview TX
Date: June 28, 2010, 1800 Central Daylight Time (CDT)
Aircraft: Embraer-145, N601DW
Operator: American Eagle, Flight 3224
NTSB Number: CEN10LA363

2. GROUP

A group was not convened.

3. SUMMARY

On June 28, 2010, at approximately 1800 central daylight time (CDT), N601DW, an Embraer-145, d/b/a American Eagle flight 3224, encountered severe turbulence while in cruise flight at 36,000 feet approximately 10 miles east of Shreveport, Louisiana. The captain declared an emergency and landed without incident at East Texas Regional Airport (GGG), Longview, Texas, at 1824. The airline transport rated captain and the commercial rated first officer were not injured, and the one flight attendant was seriously injured. Of the 42 passengers on board; one was seriously injured and three sustained minor injuries. The airplane was not damaged. Instrument meteorological conditions prevailed for the scheduled passenger flight conducted under 14 Code of Federal Regulations Part 121. A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board's Audio Laboratory for readout.

4. DETAILS OF INVESTIGATION

On July 1, 2010, the NTSB Vehicle Recorder Division's Audio Laboratory received the following CVR:

Recorder Manufacturer/Model: **Honeywell 6022 SSCVR 120**
Recorder Serial Number: **1443**

4.1. Recorder Description

Per federal regulation, aircraft manufactured prior to April 7, 2010, must be equipped with a CVR that records a minimum of the last 30 minutes of aircraft operation; this is accomplished by recording over the oldest audio data. When the CVR is deactivated or removed from the airplane, it retains only the most recent 30 minutes or 2 hours of CVR operation, depending on the CVR model. This model CVR, the Honeywell 6022 SSCVR 120, is a solid-state CVR that records 2 hours of digital cockpit audio. The recorded audio data is separated by the Honeywell download software into 2 sets of audio data files: a) a 2-channel recording containing the last 2 hours of recorded events and b) a 4-channel recording containing the last 30 minutes of recorded events. During the 2-hour portion of the recording, one channel contains audio information from the cockpit area microphone (CAM) and the other channel contains a mixture of two audio sources: the captain's audio panel information and the first officer's audio panel information. The 30-minute portion of the recording contains 4 channels of audio data; one channel for each flight crew and one channel for the CAM audio information.

4.2. Recorder Damage

Upon arrival at the audio laboratory, it was evident that the CVR had not sustained any heat or structural damage and the audio information was extracted from the recorder normally, without difficulty.

4.3. CVR Channels

The recording consisted of four channels of audio information, however none of the audio was pertinent to the incident/accident investigation. The audio was consistent with the CVR being overwritten or recorded over by subsequent events. Characteristics of overwritten CVRs include:

- Audio consistent with the airplane being stationary on the ground with electrical power on.
- Post accident conversations or sounds that are irrelevant, or do not provide any additional information useful to the investigation.
- Conversations or other audio consistent with maintenance personnel working in or near the cockpit.
- Conversations or other audio indicating the airplane is taxiing after an incident.
- Background sounds in an unoccupied cockpit such as:
 - Radio transmission from other aircraft or ground facilities.

- Unintelligible or difficult to discern conversation or other sounds likely emanating from the cabin or outside the airplane.

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Vehicle Recorder Division

Attachment I

CVR Quality Rating Scale

The levels of recording quality are characterized by the following traits of the cockpit voice recorder information:

- Excellent Quality** Virtually all of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate only one or two words that were not intelligible. Any loss in the transcript is usually attributed to simultaneous cockpit/radio transmissions that obscure each other.
- Good Quality** Most of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate several words or phrases that were not intelligible. Any loss in the transcript can be attributed to minor technical deficiencies or momentary dropouts in the recording system or to a large number of simultaneous cockpit/radio transmissions that obscure each other.
- Fair Quality** The majority of the crew conversations were intelligible. The transcript that was developed may indicate passages where conversations were unintelligible or fragmented. This type of recording is usually caused by cockpit noise that obscures portions of the voice signals or by a minor electrical or mechanical failure of the CVR system that distorts or obscures the audio information.
- Poor Quality** Extraordinary means had to be used to make some of the crew conversations intelligible. The transcript that was developed may indicate fragmented phrases and conversations and may indicate extensive passages where conversations were missing or unintelligible. This type of recording is usually caused by a combination of a high cockpit noise level with a low voice signal (poor signal-to-noise ratio) or by a mechanical or electrical failure of the CVR system that severely distorts or obscures the audio information.
- Unusable** Crew conversations may be discerned, but neither ordinary nor extraordinary means made it possible to develop a meaningful transcript of the conversations. This type of recording is usually caused by an almost total mechanical or electrical failure of the CVR system.