

**NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Vehicle Recorder Division
Washington, D.C. 20594**



SPECIALIST'S FACTUAL REPORT OF INVESTIGATION

ANC18LA020

**By
Joseph A Gregor**

WARNING

The reader of this report is cautioned that the summary of a cockpit voice recorder audio recording is not a precise science but is the best product possible from a Safety Board investigative effort. The summary or parts thereof, if taken out of context, could be misleading. The summary should be viewed as an accident investigation tool to be used in conjunction with other evidence gathered during the investigation. Conclusions or interpretations should not be made using the summary as the sole source of information.

NATIONAL TRANSPORTATION SAFETY BOARD
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November 5, 2018

Cockpit Voice Recorder

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1. EVENT SUMMARY

Location: Pacific Ocean, off the coast of Japan
Date: January 26, 2018
Aircraft: Airbus Helicopters SA330
Operator: Erickson Helicopters
NTSB Number: ANC18LA020

On January 26, 2018, about 0225 universal coordinated time (UTC), an Airbus Helicopters SA330, N339EV, sustained substantial damage during a fresh water engine rinse aboard the USNS Wally Shirra while in international waters of the Pacific Ocean. The flight was being operated as a Title 14 *Code of Federal Regulations* (CFR) Part 133 external load flight.

2. GROUP

In consultation with the IIC, a cockpit voice recorder (CVR) group was not convened. A summary of events from the CVR follows.

3. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model: **Universal CVR-120**
Recorder Serial Number: **2617**

3.1 CVR Carriage Requirements

Title 14 *Code of Federal Regulations* (CFR) Part 133 does not specify any CVR carriage requirements. Per federal regulation, multiengine aircraft with more than six passenger seats and requiring two pilots manufactured prior to April 7, 2010, and operated under Title 14 CFR 91, 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. The accident aircraft was manufactured in 1974.

3.2 Recorder Description

This model CVR, the Universal CVR-120, is a solid state CVR that records 120 minutes of digital audio. Specifically, it contains a 2-channel recording of the last 120 minutes of operation and separately contains a 4-channel recording of the last 30 minutes of

operation. The 120-minute portion of the recording is comprised of one channel that combines three audio panels sources – captain (CAPT), first officer (FO), and Observer – and a second channel that contains the cockpit area microphone (CAM) source. The 30-minute portion of the recording contains 4 channels of audio information: one channel for each flight crew, one channel for the CAM, and one channel for a cockpit observer.

3.3 Recorder Damage

Upon arrival at the 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.

3.4 Audio Recording Description

Each channel's audio quality¹ is indicated in Table 1. Channel number three did not contain any crew audio information (nor was it required by federal regulations).

Table 1: Audio Quality.			
Channel Number	Content/Source	Quality	Duration
1	FO	Excellent	30 min
2	CAPT	Excellent	30 min
3	Observer	Excellent	30 min
4	CAM	Unusable	30 min
5	Combined	Excellent	2 hr
6	CAM	Unusable to Good	2 hr

The audio quality of channel number four, the CAM channel, was unusable during flight due to excessive wideband noise masking all other sounds. The quality of the recording produced by this channel became good during ground operations, once the aircraft engines had been shut-down.

3.5 Timing and Correlation

In consultation with the Investigator-In-Charge (IIC), timing on the summary was expressed in elapsed time from the beginning of the CVR recording.

3.6 Description of Audio Events

The recording started with the helicopter in-flight performing multiple pickup and drop operations. Each operation involved changes of aircraft control between the CAPT and FO. About eighteen minutes into the recording, the CAPT and FO began troubleshooting a landing gear indicator light malfunction. The helicopter entered a hover at a ship identified as Red Beard for a shipboard visual inspection of the landing gear. The helicopter then continued to perform pickup and drop operations for approximately fifty minutes before landing onboard a ship identified as Gold Eagle for refueling. Approximately forty minutes later, refueling was completed and the helicopter was cleared for takeoff from Gold Eagle to Red Beard to drop off a passenger. The helicopter then completed three more pickup and drop operations before being cleared to land for “chock and chains” on Red Beard.

¹ See attached CVR Quality Rating Scale.

At 02:03:13 [hr:min:sec] into the recording, the CAPT announced, “autopilot off.” He then stated that they had, “good chock and chains... nosewheel is locked... we’re going to wash engines, shortly.” At 02:04:12, after verbally confirming the number two throttle with the FO, the CAPT stated, “number two’s coming back now.” At 02:05:33, after confirming the number two throttle again with the FO, the CAPT stated, “...showing about ah eighty five coming up on number two.” At 02:05:55, after confirming the number one throttle with the FO, the CAPT stated, “number one’s coming back now.” Approximately 3.9 seconds later, the CVR recorded a loud unidentified sound, and the FO responded, “what the #² was that?” and noted that the pressure was coming down. The CAPT noted that it sounded like a sudden stoppage somewhere, and the background noise due to the engines decreased. The recording ended at 02:07:56.5.

² Expletive word or phrase.

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.