NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C.

Attachment 10

CIDS Teardown Report

(4 Pages)

MINUTES OF MEETING

TO	*FROM*
Mr. Frédéric Hervelin – BEA Safety Investigator	Ovidiu Deftu (Airbus Cabin Electronics Customer Support)
Mr. David Lefrancq – Airbus Customer Support Cabin Engineer	*LOCATION / DEPARTMENT*
Mr. Dirk Blohm – Airbus Design Office CIDS Certification Specialist	Airbus Cabin Electronics / TBCKST
Mr. Ulrich Ikemann – Airbus Design Office CIDS Specialist	*DATE*
	2009-04-22
Mr. Norbert Bredow – Airbus Cabin Electronics Repair Shop Manager	------------
	------------------------------
Mr. Peter Schumacher – Airbus Cabin Electronics Customer Support	--------
	------------------------------
	------------- ·
	--------------- -----------------
COPY	*REFERENCE*
	TBCKST 114-2009

SUBJECT	*DATE OF MEETING*
USA A320 MSN 1044 CIDS directors readout	21.-22.04.2009
MINUTES	*ACTIONS*

Participants :
Mr. Frédéric Hervelin
Mr. David Lefrancq
Mr. Dirk Blohm
Mr. Ulrich Ikemann
Mr. Norbert Bredow
Mr. Ovidiu Deftu
Mr. Peter Schumacher

The purpose of this investigation was to perform a CIDS DIR NVM Memory readout, focusing on the cabin interphone system functionality.

The Inspection started on the 21st April 09 at 01:15 pm at Airbus Buxtehude, Germany.
The Box containing the material to be investigated was found in a quarantined area that was properly locked.
The Box was found sealed and in a good condition. It was opened in the presence of the BEA Representative and contained the following material:
3 handsets, all with P/N 89-01-07122, S/Ns: 125339 (FWD), 111485 (AFT R/H), 120151 (AFT L/H).
CAM P/N Z050H6068051, S/N 050H00003922,
Two CIDS Directors with the same P/N Z010H000520A, S/Ns: 03150 and 03487
One CFDIU P/N B401ACM05, S/N 1171.
After unit identification, only the directors were kept for investigation.

Visual inspection of CIDS directors (performed in the Repair Shop):

S/N 03150:
Dusty areas on both sides,
ARINC connector corroded,
Maintenance seal OK, external mechanical condition ok (no deformation).

S/N 03487
Dusty areas on both sides,
Connector side very dirty and corroded,
Maintenance seal OK, external mechanical condition ok (no deforma-
tion).

**Box S/N 03487 was opened using a calibrated electrical screw
driver:**

The Cover was easily opened. The general condition of the boards
within the box was very dusty. The boards were in place.
The OBRM was disengaged and removed, to enable access to the
Processor Board that contains the two Memories of interest (IC23 and
IC24).

The Processor board was identified with P/N Z012K2100110 amend-
ment D S/N 01619.
Both memories (EEPROM) were apparently not mechanically dam-
aged.
The Microscope observation confirmed a general good mechanical
condition. However, they were sandy, dusty and their pins were par-
tially corroded. Both Memories have the reference X28HC256.

The memories were labeled with identification stickers containing the
DIR S/N and Component location on the board.
Then the memories were carefully removed from the board sockets
and cleaned with isopropanol alcohol, brushed and air dried.
The Binocular inspection of the memories was OK.

Memory Read-Out for the ICs from S/N 03487:

At the beginning a test was performed with a known good memory of
the same reference and containing data, to ensure that the read-
ing/copying memory operation is correct and that the data is not cor-
rupted due to the read-out operation.
Result of the test: check sum test OK.

Then it was proceeded with the read-out of the event memories.
Start with S/N 03487 IC23 memory copy. First attempt failed with a
message "continuity test failed" (continuity problem).
Then the memory was re-cleaned using a fiber glass pen, same alco-
hol and dry air.
2nd attempt : Checksum 006A7C2D. This Checksum was confirmed
by a second read-out procedure.
A brand-new EEPROM was inserted into the tool to create a 1:1 copy
of the original memory.
The copy was successful (same checksum).

The same cleaning procedure was applied to IC 24 and the read-out
and copying were successfully performed at the 1st attempt. Check-
sum Reference 006AB6BC.

Also the Copied Memories were properly labeled. Additionally the raw

data was saved into binary files and stored on CD.

Then both copies were reinstalled into a test CIDS Director for reading purposes.

Readout of the memories was performed using BITE A320 SW. The communication with the Test Director was checked OK; the Reading of the Memories was successful.

Note: the BITE memory is divided into three parts as follows:
- class 1 and 2 faults in flight
- class 1 and 2 faults on ground.
- Class 3 faults.

The BITE memory is a ring buffer storing faults for a maximum of 64 legs for class 1 and 2 faults in flight. The Ground part stores class 1 and 2 faults during the last ground status. The Class 3 Part stores class 3 faults detected during the last CIDS power up.

Reading results: Only zeros shown on screen for the Class 1 and 2 parts. The class 3 faults are not relevant for the CIDS interphone functionality. However, a class 3 fault read-out test was done to ensure the integrity of the memory storage. This test was successful.

The Box S/N 03150 was opened using the calibrated electrical screw driver.

The Cover was easily opened. The general condition of the boards within the box was very dusty. The boards were in place.
The OBRM was disengaged and removed, to enable access to the Processor Board that contains the two Memories of interest (IC23 and IC24).

The Processor board was identified with P/N Z012K2100110 amendment D S/N 01217.

Both memories (EEPROM) were apparently not mechanically damaged.
The Microscope observation confirmed a general good mechanical condition. However, they were sandy, dusty and their pins were partially corroded. Both Memories have the reference X28HC256.

The memories were labeled with identification stickers containing the DIR S/N and Component location on the board.
Then the memories were carefully removed from the board sockets and cleaned using a fiber glass pen, brushed with isopropanol alcohol and air dried. The Binocular inspection of the memories was OK.

Memory Read-Out for the ICs from S/N 03150:

Start with copy process of IC23 memory copy.
However, the first attempt failed with continuity problem. The same problem occurred for IC24.
Then the memories were re-cleaned using again the fiber glass pen, same alcohol and dry air.

2nd attempt for IC23 was successful.
Checksum 006A7C52. This checksum was confirmed by a second read-out. Using the same procedure as above, a 1:1 copy was created and the raw data was saved on CD.

2nd attempt for IC24 was successful.
Checksum 006AB6B1. This checksum was confirmed by a second read-out. Using the same procedure as above, a 1:1 copy was created and the raw data was saved on CD.

Then both copies were reinstalled into a test CIDS Director for reading purposes.

Readout of the memories was performed using BITE A320 SW. The communication with the Test Director was checked OK; the Reading of the Memories was successful.

Reading results: Only zeros shown on screen for the Class 1 and 2 parts. The class 3 faults are not relevant for the CIDS interphone functionality. However, a class 3 fault read-out test was done to ensure the integrity of the memory storage. This test was successful.

The end of the memory readout was at 05:30 pm same day.

Conclusion

The readout of the CIDS BITE memory of the Directors installed on USA A320 MSN 1044 was successfully performed.
For both CIDS Directors (P/N Z010H000520A, S/N 03150 and S/N 03487) neither class 1, nor class 2 fault messages were recorded on their memories.
This indicates that neither class 1 nor class 2 faults affecting the CIDS interphone functionality were detected by the CIDS during the last 64 legs.

A CD containing this report (Ref. TBCKST 114-2009), the associated pictures and the 4 memory raw data files was provided to BEA and Airbus Flight Safety Department.

All parts originally received and additionally the 4 copies of the memories were packed back and sealed in the original shipping box in the presence of the BEA Representative. This package will be sent back to the NTSB on their request.