SERIOUS INCIDENT

Aircraft Type and Registration:	Airbus A320-214, G-EZWX
No & Type of Engines:	2 CFM56-5B4/3 turbofan engines
Year of Manufacture:	2014 (Serial no: 6192)
Date & Time (UTC):	28 November 2016 at 1303 hrs
Location:	En route Edinburgh to Hamburg
Type of Flight:	Commercial Air Transport (Passenger)
Persons on Board:	Crew - 6 Passengers - 172
Injuries:	Crew - None Passengers - None
Nature of Damage:	Static inverter overheated
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	44 years
Commander's Flying Experience:	6,316 hours (of which 4,138 were on type) Last 90 days - 142 hours Last 28 days - 26 hours
Information Source:	AAIB Field Investigation

Synopsis

During the en route climb, the flight crew noticed smoke and fumes in the cockpit and donned their oxygen masks. Shortly after, the ECAM AVIONICS SMOKE caption was displayed and the aircraft diverted to Newcastle Airport. During the descent, the smoke appeared to dissipate after the crew carried out the Quick Reference Handbook (QRH) avionics smoke drill. The aircraft landed without further incident.

The source of the smoke and fumes was traced to the cockpit additional electrical supply static inverter, which had overheated. This was the third failure to have occurred on the operator's fleet of Airbus A320 aircraft since August 2014. The operator was not aware that the aircraft manufacturer had issued a technical publication in March 2016 that identified the cause of the problem, and that the supplier had issued a Vendor Service Bulletin in October 2016 that recommended the replacement of the capacitor involved in the failure mode. A batch of 2,058 units was affected. The failed static inverter on G-EZWX was one of this batch. The investigation also identified an undocumented feature of the interphone emergency call function related to communication re-establishment after a handset reset; awareness of this feature could improve communication management between the cockpit and cabin crew.

History of the flight

The aircraft was on a scheduled flight from Edinburgh Airport to Hamburg Airport, Germany, with 172 passengers and six crew members on board. At 1303 hrs, 11 minutes into the

flight, the aircraft was passing FL230 in the climb when the commander and co-pilot became aware of smoke and fumes in the cockpit. Both crew donned their oxygen masks, which coincided with the AVIONICS SMOKE caption being displayed on the ECAM. The commander took control of the PF duties and radio communications with ATC, whilst the co-pilot carried out the QRH SMOKE/FUMES/AVNCS SMOKE drill.

At about the same time that smoke and fumes appeared in the cockpit, several cabin crew at the rear of the aircraft also noticed fumes in the cabin. This was shortly followed by the commander making an "attention, crew at all stations"[1] PA announcement, alerting the cabin crew to a potential emergency. The commander then declared a MAYDAY to ATC, advising that they had smoke and fumes in the cockpit, and were diverting to Newcastle Airport, which was 47 nm ahead of the aircraft's track. On a few occasions, the crew had to repeat themselves due to difficulties hearing each other when using the oxygen masks. The commander also had to repeat part of the MAYDAY transmission as the controller did not initially understand him.

About a minute after the co-pilot had set the avionics EXTRACT and BLOWER to OVRD, the smoke in the cockpit started to dissipate. The co-pilot then selected the interphone emergency call function to ascertain the status of the cabin crew and provide a NITS[2] brief to the cabin manager (CM). The CM, who was now seated at the forward attendant station, heard three interphone call 'chimes' in the cabin and answered the call by lifting his handset from its cradle, but he could not hear the co-pilot. However, the co-pilot was able to hear the CM speaking, and started to brief him before he realised that he was not being heard. This was coincident with the CM hanging up his handset. During this failed attempt to communicate and about the same time as the aircraft started a descent to Newcastle, the AVIONICS SMOKE caption extinguished on ECAM.

The interphone emergency call initiated by the co-pilot continued to remain active, and about a minute later, the commander and co-pilot heard one of the cabin crew speak on the interphone trying to get their attention; this cabin crew member was seated at the attendant station at the rear of the aircraft. Due to a slight delay in responding, the cabin crew member hung up the handset just as the co-pilot answered. The CM made a PA announcement to the passengers using the handset at the forward attendant station, advising them to remain seated and await further instructions.

The commander asked the co-pilot if he had spoken to the cabin crew, and advised him that they were now only about ten minutes from landing. The co-pilot stated that he was still having difficulties in speaking with them, but would try again; the sound of a cockpit switch selection and a single 'chime' were recorded on the CVR.

The CM, upon hearing the interphone call chime in the cabin, removed his handset from its cradle and pressed and released the EMER CALL button on the keypad before speaking

Footnote

[1] The operator's procedures described that on hearing this announcement, cabin crew should immediately interrupt their duty and stow away any catering equipment, before returning to their stations and fastening their harness to await further instructions from the cabin manager or pilots.

[2] Nature, Intention, Time and Special Instructions.

into it. The co-pilot responded and two-way communications was finally established. A NITS brief was provided to the CM, who then briefed the cabin crew before he made a PA announcement to the passengers, advising them that they were making a precautionary landing at Newcastle Airport. Three minutes elapsed between the time that the co-pilot first activated the interphone emergency call function and when two-way communication was established with the cabin crew.

The approach and landing at Newcastle were uneventful. The aircraft was met by the RFFS on the taxiway, where the aircraft was stopped and the engines shut down. The RFFS carried out an inspection of the aircraft, during which fumes were still noticeable in the cockpit and the aircraft was electrically powered down as a precaution. The passengers were disembarked using stairs and taken to the terminal by buses.

Recorded information

A complete record of the incident flight was available from the aircraft's CVR and FDR; pertinent information has been included in the history of flight. The selections and status of the cabin interphone system is not recorded on the FDR.

Aircraft examination

The source of the smoke and fumes was traced to the cockpit additional electrical supply static inverter[3], which had overheated. A replacement item was installed and the aircraft subsequently returned to service.

Static inverter

The cockpit additional electrical supply static inverter converts 28VDC input power to 115VAC/60Hz output power, which is provided to three outlets in the cockpit to enable the charging of electronic devices, such as Electronic Flight Bags. The static inverter is in the avionics bay, installed below the cockpit floor near the co-pilot's footwell. By design, the cockpit floor is not sealed and so smoke or fumes generated in the avionics bay may enter the cockpit. The static inverter has been standard equipment on Airbus A320 family[4] aircraft since the end of 1999, and may also be installed on Airbus A330, A340 and A380 aircraft types.

Static inverter failures

The operator of G-EZWX experienced its first failure of a cockpit additional electrical supply static inverter on 28 August 2014. This was reported in AAIB Bulletin 12/2014, and involved G-EZWM, an Airbus A320 aircraft, which diverted to London Gatwick due to smoke and fumes in the cockpit. Inspection of the static inverter found that damage centred on a capacitor, C306, which had overheated and failed. This resulted in the release of a '*strong acrid electrical type*' smell. At this time, the static inverter manufacturer considered that the failure was an isolated occurrence.

Footnote

[3] Part Number 1-002-0102-1830, serial number AA11136801.
[4] This includes the A318, A319, A320 and A321 aircraft types.

In January 2015, the operator had a second static inverter failure. This unit was fitted to Airbus A320, registration G-EZWK, which diverted to Amsterdam whilst en route from Berlin to Bristol, due to smoke and fumes in the cockpit. On both occasions, the crew had donned their oxygen masks.

The aircraft manufacturer had received reports, including those from other operators, of eight other static inverter failures between August 2014 and December 2016. Of the total of 11 failures (including that of G-EZWM, G-EZWK and G-EZWX), eight had occurred between August 2014 and March 2016. The reports submitted to the aircraft manufacturer indicated that the failures had all occurred in flight, with at least seven resulting in diversions.

Notification of static inverter failures to operators

On 9 March 2016, following the first eight failures, the aircraft manufacturer issued Technical Follow-up (TFU) 24.00.00.114, '*Premature failure of the Cockpit Additional Supply Static Inverter*`. This noted that '*some operators of the A320FAM aircraft experienced premature failure of this static inverter which led to smoke/burn smell in the cockpit*'[5], and that the fault had been isolated to capacitor C306 (the same component identified during the G-EZWM investigation in August 2014). This capacitor had been identified as not having received an individual quality screening prior to fitment, with a batch[6] of 2,058 static inverters affected. The vendor had yet to develop a solution and no remedial action was provided in the TFU at that time.

On 13 October 2016, VSB 1830-25-37, '*Equipment – Cockpit Additional Electrical Supply – Static Inverter – Capacitor C306 replacement,'* was published on the vendor's website, which recommended the static inverter to be removed for modification. On 19 October 2016, TFU 24.00.00.114 was updated by the aircraft manufacturer to reflect that VSB 1830-25-37 was available and noted that operators could modify their affected static inverters free of charge.

Technical Follow-up notices and Operator Information Transmissions

TFUs form part of the aircraft manufacturer's technical documentation that is provided to operators. In July 2014, the aircraft manufacturer rationalised its documentation processes, including TFUs, following recommendations from operators. It communicated these changes to TFUs in Operator Information Transmission (OIT) 999.0017/14 which stated that it would ensure that there is a clear segregation between:

- 'Instructions,' which were defined as 'documents which enable operators to perform an action on their aircraft' and
- 'Information,' defined as 'documents that help customers to support and improve the operation of their aircraft.'

Footnote

[5] *'A320FAM'* refers to the A320 family of aircraft.

[6] Part number 1-002-0102-1830, serial numbers from AA11135265 to AA11137323 (manufactured between 10 September 2012 and 25 November 2014).

The TFU was defined by the aircraft manufacturer as a type of document providing '*Information*,' not '*Instructions*.'

The aircraft manufacturer further advised that:

- '*TFU gives operators follow-up information, from the time an issue is identified to the time that the solution has proven its efficiency in the field. However, TFU may make recommendations to apply instructions that are included in other relevant publications such as Service Bulletins or AMM/ TSM tasks*'[7]

and that:

- 'an OIT *'is issued to communicate quickly to operators information on in-service events or findings reported to Airbus, that have substantial implications on the Airbus fleet operations, and to provide relevant advices or recommendations in order to address or mitigate them.'*

Operator's TFU and VSB review process

TFU's may be accessed by operators using an online electronic database which can be configured to provide automatic notifications when a new TFU is issued, or track the status of an existing one. The operator of G-EZWX used a maintenance management software system called AMOS[8], which formed part of its airworthiness control. Technical documents, such as Airworthiness Directives, Service Bulletins (SBs) from the aircraft manufacturer, and OITs were imported into AMOS by the operator. This information was then reviewed by its engineering department, who would implement the necessary action. However, TFUs were not imported into AMOS, nor routinely reviewed by the operator.

The operator of G-EZWX did not receive notification from the static inverter manufacturer that VSB 1830-25-37 had been issued in October 2016, as it had not registered with this vendor to receive updates. The operator advised that it relied predominantly upon communications from the aircraft manufacturer to identify VSBs that required follow-up action.

On 1 December 2016, three days after the incident to G-EZWX, and following discussions with the aircraft manufacturer's on-site representatives, the operator became aware of TFU 24.00.00.114 and VSB 1830-25-37.

Decision to issue TFU by the aircraft manufacturer

On 2 December 2016, the operator of G-EZWX asked the aircraft manufacturer why the cause of the static inverter failures was communicated in a TFU, rather than an Alert

Footnote

[7] AMM (Aircraft Maintenance Manual) and TSM (Trouble Shooting Manual).
[8] AMOS is a proprietary software system that is in use at over 140 other operators.

Operator Transmission (AOT), an OIT or an SB[9], which it considered more appropriate in relation to the '*severity of the outcome;'* noting that:

> *'failure of the capacitor due to overheating resulting in a smoke smell event should be classified as a safety issue and hence should have been clearly communicated to the operators.'*

The aircraft manufacturer advised that its initial analysis, following the first eight failures, had determined that a TFU was the most appropriate means of communicating the information related to the overheating of the Static Inverter capacitor 306, and, from October 2016, related to the availability of the VSB 1830-25-37. The analysis had taken into account aspects such as failure mode, availability of crew procedures and impact on airworthiness and safety.

The aircraft manufacturer further advised that it had continued to reassess the situation and had decided in September 2016 that it would issue an OIT to '*broaden awareness* amongst operators. The OIT 999.0096/16 '*Failure of the Cockpit Additional Electrical Supply System'* was submitted for internal review on 20 October and issued to all operators on 15 December 2016. This OIT highlighted that the reason for the failure of the static inverter had been identified and VSB 1830-25-37 had been published to address this.

The AAIB contacted another UK operator that operated a large[10] fleet of the Airbus A320 family of aircraft. It had a similar understanding of TFUs, had similar internal processes to deal with them and TFUs did not form part of its routine technical document review process. This operator had several of its aircraft fitted with static inverters from the affected batch and only became aware of the issue following receipt of OIT 999.0096/16.

Cabin interphone system

The Airbus A320 is equipped with a Cabin Intercommunication Data System that incorporates the functions of the cabin and cockpit interphone and passenger address systems. The cabin and cockpit interphone system allows telephone communications between all cabin crew attendant stations and the cockpit. Communication at each cabin attendant station is made using a handset. G-EZWX was fitted with one handset at the forward cabin crew attendant station (Figure 1), and two handsets at the rear attendant stations.

In the cabin, interphone calls can be made from an attendant station to another attendant station or the cockpit, by making the appropriate selection on the handset's keypad (Figure 2). The handsets are also used to make passenger announcements in the cabin.

Footnote

[9] An AOT and an OIT are used when it is necessary to communicate quickly with operators, and provides a means to raise the awareness of operators to information issued which is related to significant in-service events. An SB issued by the aircraft manufacturer provides instructions, and can be used to cross-reference to VSB's issued by a vendor.

[10] More than 100 aircraft.

On G-EZWX, a call can be made from the cockpit to either the forward attendant station, aft attendant stations, or all attendant stations simultaneously. These options are selected by pressing and releasing the FWD, AFT or EMER pushbutton switches on the overhead panel in the cockpit. For a pilot to listen to an interphone call in the cockpit, the CAB (cabin) reception knob on the pilots' audio control panel (ACP) must be selected ON. For the cabin crew to hear the pilot speaking over the interphone, the pilot must select the ATT (attendant) transmission key on the ACP to ON, and then set the INT/RAD switch on the ACP to the RAD position, or depress and hold the sidestick radio transmit selector, whilst speaking into the boom or oxygen mask microphone.

The cabin interphone system prioritises calls initiated from the cockpit, which override calls made from the cabin.

An interphone call to an attendant station handset is 'connected' when the handset is unlatched and removed from its cradle. If the 'connected' handset is then placed back onto its cradle, or the RESET button on the handset's keypad is pressed and released, the handset is 'disconnected' from the call. This is referred to as a handset that has been 'reset'.

Figure 1

G-EZWX forward attendant position handset in its cradle

Figure 2

G-EZWX forward attendant position handset keypad

Cabin interphone - normal operation for calls between cabin and cockpit

Under normal operation, calls from the cabin attendant stations to the cockpit are initiated by pressing and releasing the CAPT button on the handset keypad. When selected, the ATT key on all ACP's are illuminated and a buzzer sounds[11] once in the cockpit. In the cabin, the 'CAPTAIN' message is displayed on the corresponding attendant station Attendant Indication Panel (AIP).

Calls from the cockpit to the cabin are initiated by selecting either the FWD or AFT attendant station call switches on the cockpit overhead panel. When selected, the red lights illuminate on the corresponding forward or aft area call panel, a single hi-low chime sounds in the relevant section of the cabin and a 'CAPTAIN CALLS' message is displayed on the adjacent AIP.

Cabin interphone - emergency operation for calls between cabin and cockpit

In an emergency, a call can be made from one attendant station handset to all other attendant stations and the cockpit, enabling simultaneous communications between crew members. This is initiated by pressing and releasing the EMER CALL button on the handset. When selected, the buzzer in the cockpit sounds three times and the EMER pushbutton switch and all ACP ATT keys flash repeatedly. In the cabin, red lights flash at both forward and aft area call panels, three hi-low chimes sound in the cabin and the 'EMERGENCY CALL' message is displayed on all AIP's[12].

The emergency interphone function is initiated from the cockpit to all cabin attendant stations by pressing and releasing the EMER pushbutton on the overhead panel. This results in red lights flashing at both forward and aft area call panels, three hi-low chimes sounding in the cabin and the 'CALL EMERGENCY' message displayed on all AIPs.

An emergency interphone call from the cockpit is cancelled under the following conditions:

- when all attendant station handsets have been 'reset', or
- after two minutes, if the cockpit ACP has not been configured to transmit on the interphone channel by selection of the ATT key, or
- after approximately five minutes if the emergency call is not connected to an attendant station handset.

Cabin interphone - testing

A test of the emergency interphone system on G-EZWX found no defect in its operation. However, it was found that when an emergency call from the cockpit was initiated and the forward attendant station handset was then lifted from its cradle, connecting it to the call, and the handset was then 'reset' (disconnected) by either placing it back onto its cradle or by pressing the RESET button on its keypad:

Footnote

[11] The buzzer is inhibited during takeoff and landing.

[12] Depending upon configuration, the message may only be displayed on the AIP adjacent to the handset where the call was initiated.

- It was possible to make a PA announcement to the cabin from the forward handset whilst the emergency interphone call from the cockpit was still in progress.
- It was not possible to make a call to the cockpit by selecting the CAPT button on the forward handset's keypad until the emergency interphone call was cancelled.
- It was not possible to call an attendant station handset at the rear of the aircraft from the forward handset unless the handset at the rear had also been reset, or until the emergency interphone call was cancelled.
- Pressing and releasing the EMER CALL button on the forward handset's keypad resulted in this handset being 'reconnected' to the emergency call, enabling the re-establishment of communication with the cockpit.
- Pressing and releasing the FWD pushbutton on the overhead panel in the cockpit, whilst the emergency call function was still active, resulted in a single hi-lo chime in the forward cabin. If the forward handset was then removed from its cradle, it was connected to the call from the cockpit.

Cabin interphone – documentation and training

Documentation provided by the operator to its cabin and cockpit crews did not include information on how to re-establish communications from a 'reset' handset to an emergency interphone call initiated from the cockpit or cabin. The operator's documentation was based on that provided by the aircraft manufacturer.

The AAIB investigation noted that specific use of the emergency interphone call function was not included in cabin crew training.

Analysis

Static inverter failure

There have been a number of failures of static inverter associated with a particular batch of an internal component. Following identification of the first eight failures, the aircraft manufacturer provided information to operators in the form of a TFU. The aircraft manufacturer's decision to use a TFU as the most appropriate communication method was based on a number of factors, including operational procedures being in place to remove smoke and fumes released into the cockpit.

A TFU does not require operator action and is a document that '*helps customers to support and improve the operation of their aircraft.*' As no follow-up action is required, the operator of G-EZWX, like another UK operator, did not conduct regular reviews of TFUs as part of its airworthiness control processes. This contrasts with important information provided in Airworthiness Directives, Service Bulletins and Operator Information Transmissions which are likely to require operator action and so are subject to regular review.

On 13 October 2016, just over a month prior to the failure on G-EZWX, the static inverter manufacturer made VSB 1830-25-37 available on its website and, six days later, the aircraft manufacturer updated TFU 24.00.00.114 to incorporate this information. However, the operator was not aware of this VSB and did not review the updated TFU, as the operator relied predominantly on the aircraft manufacturer to communicate such information by means of an OIT or SB to indicate that action might be required. After the incident, the manufacturer's on-site representatives made the operator aware of both the TFU and VSB.

On 15 December 2016 the aircraft manufacturer issued OIT 999.0096/16 **'***Failure of the Cockpit Additional Electrical Supply System'* to all operators. This OIT was issued to "*broaden awareness"* that the reason for the failure of the static inverter had been identified and VSB 1830-25-37 had been published to address this. One other UK operator, which had a number of its own aircraft affected, only became aware of the issue upon receipt of this OIT.

Smoke in the cockpit and the emergency use of oxygen by flight crews are considered to be safety issues by ICAO and, in Annex 13 Attachment C, cite them as possible examples of a Serious Incident. Following the G-EZWX event, the operator queried the aircraft manufacturer's use of a TFU in this instance as it had concerns that the identified mechanism of the '*capacitor failure due to overheating resulting in a smoke smell event should be classified as a safety issue and hence should have been clearly communicated to the operators.*' The failure of the static inverter on G-EZWX resulted in an unplanned diversion and the flight crew donning oxygen masks. As a consequence of the smoke and fumes released into the cockpit, this particular mode of failure of the static inverter has resulted in a total of seven aircraft diverting.

Cockpit to cabin communications

The co-pilot experienced difficulties in communicating with the cabin crew using the emergency interphone system, and it took three minutes from first selecting the emergency interphone function before two-way communication was eventually established.

It was most likely that the reason the CM had been unable to hear the co-pilot was because the co-pilot had not set his ACP to transmit on the cabin attendant channel, or he had omitted to select the radio transmit switch on his ACP or sidestick whilst speaking into the oxygen mask microphone. This led to the CM hanging up his handset, which disconnected it from the emergency call.

The CM was then able to make a passenger announcement from the forward handset. However, as the emergency interphone call was still active, it would not have been possible for the CM to have initiated an interphone call to either the cockpit or cabin crew at the rear of the aircraft, until the emergency call was cancelled. In the absence of any other action, this would have required the CM to wait for up to two minutes until the emergency call 'timed out.' Pressing the EMER CALL button on his handset would have reconnected the CM to the emergency call immediately; however, the CM was not aware that this was required as it was neither documented nor covered in training.
Three minutes after having initially tried to establish communications with the cabin crew,

a button press in the cockpit accompanied by a single call chime was recorded on the CVR. The CM removed his handset from its cradle and pressed and released the EMER CALL button on the keypad before speaking into it. Communications were then established between the CM and co-pilot. The single call chime, followed by communications being established with the CM indicates that the co-pilot had selected the forward attendant call button at this time. This call was prioritised over calls initiated from the cabin and it was therefore not necessary for the CM to have selected the EMER CALL function on his handset to connect the call.

It is important that communications between flight crew and cabin crew can easily be established in the event of an emergency and the emergency interphone system is provided to facilitate this. However, testing has shown that the system's operation is not fully documented and its use is not fully understood. The operator of G-EZWX did not provide training to crew on the operation of the emergency interphone system.

The aircraft manufacturer has acknowledged that there is a need for additional information and has launched a review of operational documentation on the operation of the emergency interphone system. This review is due to be completed in July 2017, following which additional information is to be provided to all operators. The operator of G-EZWX has advised that it will update its manuals and training once this information is available.

Safety action taken

- By 9 December 2016, the operator of G-EZWX had removed all affected static inverters from its fleet and those that were held as spares.
- The operator's engineering department is now reviewing all TFUs on a routine basis.

Further safety action

- The aircraft manufacturer has advised that, later in 2017, it will release an Inspection Service Bulletin (ISB) to assist operators in identifying and rectifying any of the affected static inverters.
- The aircraft manufacturer has also advised that it will provide additional information to operators on the operation of the emergency interphone system.
- The operator has advised that, following the provision of the additional information of the emergency interphone system from the aircraft manufacturer, it will include this as part of crew training and update the appropriate internal manuals.
- The operator has also advised that it intends to conduct a review of its processes that relate to VSBs.

Conclusion

Static inverter failure

The source of the smoke and fumes was traced to the cockpit additional electrical supply static inverter, which had overheated. The manufacturer of the static inverter isolated the fault to a component, capacitor C306, which had not received an individual quality screening prior to fitment. A batch of 2,058 static inverters were affected.

The incident on G-EZWX was the eleventh failure reported to the aircraft manufacturer which had resulted in the release of smoke and fumes into the cockpit. Of the eleven failures, at least seven had resulted in diversions.

The operator was not aware until after the incident that the manufacturer of the static inverter had published VSB 1830-25-37, nor that the aircraft manufacturer had previously communicated the problem with the static inverters in TFU 24.00.00.114. This was because the operator was not registered to receive notifications of VSB's from the manufacturer of the inverter and, like another large UK operator, did not routinely review TFUs.

Following a decision in September 2016, the aircraft manufacturer subsequently issued OIT 999.0096/16 to all operators on 15 December 2016 to "*broaden awareness"* that the reason for the failure of the static inverter had been identified and VSB 1830-25-37 had been published to address this.

Both the aircraft manufacturer and the operator intend further safety action, in addition to that which has already been taken.

Emergency interphone communications

Initial communications between the CM and co-pilot using the emergency interphone system failed to be established, as the co-pilot either inadvertently omitted to set up his ACP to transmit on the cabin interphone channel or did not select the transmit button. The CM was unable to hear the co-pilot and hung up his handset, which disconnected it from the emergency call. Communication was subsequently established with the CM about three minutes later when the co-pilot selected the forward interphone call option.

The investigation identified that neither information nor training was provided to crew on how to re-establish communications to the cockpit in the event that a cabin handset became disconnected from an emergency interphone call initiated from the cockpit.

Whilst an emergency call is in progress, it is not possible to initiate a call to the cockpit from a handset that has been disconnected. However, by selecting the EMER CALL button on the disconnected handset's keypad, the handset is reconnected to the emergency call, allowing communications with the cockpit and other cabin crew who are also on the call. The CM was not aware of this feature, but had he been, communications may have been established more quickly. The emergency interphone system is infrequently

used, and therefore it is important that crew have a good understanding of its operation in the event of an emergency.

Both the aircraft manufacturer and the operator intend to take safety action to address this issue.