The Wings' Saving Force,
Global Chemicals' Conference,
And **Regional Transportation Safety Committee** release

The Second Edition of the Final Report of The Wing Force 3W-CHT Airbus A400's Accident over Gamagu on November 25th, 2012

Released in June 2013

ABBREVIATIONS

ECG	Electron Cardiogram
ATPL	Airline Transportation Pilot License
FDR	Flight Data Recorder
CVR	Cockpit Voice Recorder
IAS	Indicated Air Speed
ENG	Engine(s)
HYD	Hydraulic (A system an aircraft uses to move control surfaces)
GEN	Generator
GPWS	Ground Proximity Warning System
CA(P)	Captain
F/O	First Officer
F/E	Flight Engineer
V/S	Vertical Speed
FMC	Flight Management Computer (A system which manages routes of an aircraft)
PA	Passenger Audio
AP	Auto Pilot
AT(C)	Air Traffic Control
IRS	Inertial Navigation System
CRM	Cockpit Resource Management
PF	Pilot Flying
PM	Pilot Monitoring

VERSION INFORMATION CONTROL

Date	**Status**
3 Mar 13	Initial version of the report is printed
5 Mar 13	1st revision to the report
5 Mar 13	The format is adjusted for better printing. Therefore, an additional empty page will be at the end of the whole report.
4 Jun 13	The second edition of the report is written.
16 Jun 13	The names are corrected.

BE ADVISED

This investigation is carried out under the requirements and restrictions of *The Chicago Convention*, Attachment 13. Notice that this report doesn't meet its standard and requirements in Section 5.12.3 and 5.12.6 in order to meet internal standard.

An investigation report aims to prevent accidents and incidents in the future. It is not used to pursue accountability.

CONTENTS

INTRODUCTION

The accident took place on November 25th, 2012. Soon after the accident, an investigation team was set up to look into the accident. To better find out the reason of the accident, WFCC invited Global Chemicals' (Chemistry) Conference and Regional Transportation Safety Committee to join the investigation. An investigation committee was established in this way.

On December 21st, 2012, a primary report was released. Then, with newly investigated facts and several updates, this final report came out by this investigation team. After the first investigation finished in March 2013, investigators agree that the accident is mainly caused by:

- The failure of forecasting the appearance of Timeres and the indirect cause from the leprechauns erode, leading to the damage caused by this kind of monster,
- Some incorrect response to the damage during the flight, such as steep turn, and
- The leprechauns' influence towards navigation and other devices.

However, after the first final investigation report came out, suggestions and criticisms came. Therefore, the investigation report is improved, with following major changes:

- More descriptions are added to flight experience (1.1) part,
- Diagrams are added to maintenance and other information,
- More background information is added (for 1.17 and other sections),
- Weather information is updated,
- The analysis, especially the chemical, zoology and pathology parts, has become more objective and scientific,
- With the help of new technology, more contents of CVR, FDR and internal audio system are decoded and added into the report,
- The engine and avionics' problems are discussed more, and
- The recommended procedure is updated.

To make the investigation more objective and scientific, investigators also invited certain specialists, including Zhang Boya. They are listed below.

Following text will discuss these problems in greater detail. Readers new to leprechauns are recommended to read Section 1.1 and 1.17 before reading other parts.

Notice that 2012 AD means the 428th year in the islands' calendar.

Investigation team

Group leader of WFCC	Group leader of GCC	Group leader of RTSC
Naught Sun	Lithium Sulfate	Seabird Starch
Pathology expert	Leprechauns' delegate	
Zhang Boya	Aisea Maize Vaarugarisu	

1 Investigated Facts

1.1 Flight Experience

The registration number of the aircraft was 3W-CHT, and the flight number was AF3403[1]. It is also known as Pltanago Asiatica. It completed takeoff and landing cycles from Bethane airport for the missions for several times, each of which is mainly for refuel. The last takeoff was at 16:55:23 local time, estimating to land at Bethane again. Before the takeoff, the aircraft had 122,345 pounds fuel, which means cruising for 8 hours. The takeoff and the beginning of the cruise was uneventful.

The flight was also used to carry out an investigation led by Mr. Kmetsch[2]. However, during the exploration in a cave of the investigation, Ms. Seniorious was found dying and sent back to the aircraft. She was immediately sent to an intensive care unit with an ECG monitor.

At 18:26:12[3], the aircraft was suddenly attacked by Timeres over Gamagu, which is 141 miles away from Brisun, an airport not far from Bethane. The battle started. Soon after that, part of the aircraft's fuselage was damaged, causing several systems on board, including hydraulic, engines and other flight controls, to malfunction. Crew members shut down overheated engines to avoid a fire and prepare for its in-flight maintenance. However, Ms. Seniorious woke up again at about 18:35 and walked straight towards the broken open door of the aircraft with clear mind. She expressed her intention to take part in the battle although others stopped her.

At 18:35:55, due to steep turn and the broken fuselage, Mr. Kmetsch was trying to pull another woman who was about to fall down through the hole of the fuselage back to the cabin, but both of them fell down. Seeing that, Ms. Seniorious jumped down "without thinking twice" and held them to decelerate. They touched the ground, but Mr. Kmetsch and another woman were hurt to badly to move. Ms. Seniorious took up the sword and directly entered the war zone without anyone else. She struggled to fight until the last Timere was defeated, which used up all her strength. This battle even influenced on-board IRS navigation device. Then, she just stood straight by the cliffs at 18:53:32, with no sense of life.

At the same time, the attempt of fixing and restarting engines and recovering from an engine failure succeeded. The hydraulic systems were also partially fixed. Pilot regained control, and then the aircraft diverted to Brisun airport at 19:32:31.

The figure of flight path is provided in following sections.

1.2 Injuries

Injury type / status	**Crews**	**Passengers**	**Other**
Fatal	0	1[4]	-

[1] In the whole report, "AF" is the callsign of The Wing Air Force.
[2] See Section 1.5 to learn more. So are Ms. Seniorious.
[3] Refers to local time (so are following time points).
[4] This is caused by a battle, so it shouldn't be considered an Aviation fatal injury.

Major	0	14	-
Minor	2	53	-
None	12	366	-
Total confirmed	14	434	-
Lost	0	2[5]	-
Total	14	436	-

1.3 Damages to the Aircraft

The aircraft was seriously damaged. Many parts of fuselage, which are mainly around doors, separated from the aircraft. They will be described in the following sections.

Internal blood and other signs suggest that the whole fuselage was completely went through by Timeres. For example:

Figure 1. Internal blood suggesting fight inside

[5] One of them is caused by a battle, while the other is caused by the aircraft.

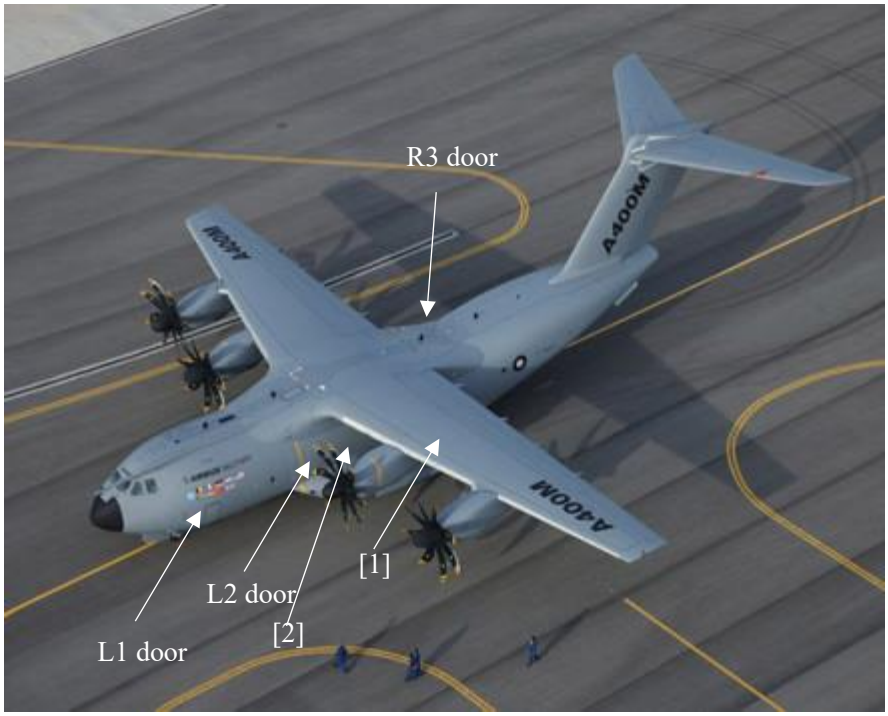

Figure 2. Damaged areas (An image of a standard A400M is used)

[1]: Several broken holes, with pipes exposed.

[2]: Broken fuselages with rivets exposed.

This kind of damage will also be discussed in 1.17.2 and following analysis.

1.4 Other Damages

The fallen wreckages, including the separated doors, destroyed several empty houses.

1.5 Crew Members and Other Related Individuals

1.5.1 Crew Members

The captain was 35-year-old Chris Lead, who had 3,453 hours on Airbus A400 and 2,393 hours on Boeing 747-400. He had both ATPL and military license. He joined the Wing Force on March 12th, 2005. This flight was his second flight in the week, and his previous flight was 56 hours ago.

The first officer was 33-year-old Aluminum Sulfate, who had only 124 hours on Airbus A400. His experience mainly came from Airbus A320, which he had flown for 1,233 hours. He had only ATPL and just joined the Wing Force. This flight was part of his test. This flight was his first flight in the week.

The flight engineer was 41-year-old Barium Sulfate, who had 3,555 hours on Airbus A400. He had both ATPL and military license. He joined the Wing Force on June 8th, 2003. This flight

was his first flight in the week.

Before getting on board, all pilots passed alcohol test.

1.5.2 Related Passengers (As Soldiers)

Commander Mr. Willem Kmetsch (Aged 18)[6]

He had L2 permission and was the manager of the "special armory", as well as its battery[7]. He was also the organizer of the civilization investigation project.

He was given a certificate on July 5, 2010, and his assignment was given on February 15, 2012. According to the internal rating system, he was outstanding, but he owed debt. By the time the battle took place, he had almost paid off all the debt.

Soldier (as well as **secretary**) Ms. Chtholly Nota Seniorious (Aged 15)[8]

She was well trained and passed all tests on May 3, 2009. Before Mr. Kmetsch took control of the "special battery", she was one of the actual managers of it. She had taken part in many battles, almost all of which succeeded. However, her records showed that she would likely use up her strength too much, making herself in danger. More detailed, According to **WF-A-17044.3**, at 120h after the beginning, she was "eroded" but didn't quit. At 724h, she completely "cut down" the Timere as well as the whole island. It's believed that this overused her ability. See the investigation to learn more.

She was diagnosed unsuitable for taking part in battles several days before the event, after she lost her ability to fly and use the sword as usual. Therefore, she got such a job and wanted to live a happy life with Willem, according to her friends.

Soldier Ms. Nephren Ruq Insania (Aged 13)[9]

She also took the aircraft during the accident and fought against the Timeres on the aircraft. After Chtholly fainted, she joined the rescue team. However, when she was searching towards the ground, at that time, she fell off the aircraft from a hole on the fuselage.

Following **soldiers** followed the investigation team but didn't actually enter the area:

Ms. Rhantolk Ytri Historia[10] (Joined the army on August 7, 2007, working for cultural investigation team in the air force)

Ms. Nofuto Que Desuperatio[11] (Joined the army on December 3, 2001, working for the air force)

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[6] Referred as "Wilem (Willem)" or "Mr. Kmetsch" in the further text. The age data might be inaccurate (Some source reported that his age was 25 or so). Following age numbers are minimums among all sources.

[7] Here, *battery* means a military unit.

[8] Referred as "Chtholly" or "Ms. Seniorious" in the further text. The age data might be inaccurate (Some source reported that her age was 20 or so).

[9] Referred as "Nephren" or "Ms. Insania" in the further text. The age data might be inaccurate (Some source reported that her age was 20 or so).

[10] Her age is unknown.

[11] Her age is unknown.

Mr. Glick Gureikurakku[12] (Aged 15[13])

1.6 Maintenance of the Aircraft

1.6.1 Normal Maintenance

The aircraft was produced in December 2009, which was a "preview" version, or, in other words, some of its parts were incomplete. Therefore, the avionics from Boeing 727 and what the Wing Force manufactured were used. The engines were also adjusted. IRS device and some parts of the wings and fuselage was manufactured by the Wing Force.

For easier boarding, the Wing Force manufactory departments also added several doors to the fuselage, connected by domestic rivets.

On August 21st, 2009, oxygen generators were installed to support breath when decompression occurs. This system worked during the accident, providing oxygen for all passengers and crew members for approximately 50 minutes.

On March 11th, 2010, the PFD and ND of Boeing 757/767 were adapted to the aircraft as an "electronic update". The upgrade work followed existing procedure.

Figure 3. Updated avionics (from a similar aircraft)

[12] His identity is partially unknown. He is also known as Gurikku.
[13] The age data might be inaccurate (Some source reported that his age was 21~32 or so).

Figure 4. Avionics before upgrading (photographed by crew members on a flight before, while climbing)

The last maintenance of the aircraft was done on July 3rd, 2012. The check suggested that there was no malfunctioning system. However, it was reported on August 5th that the left IRS of the airplane became inoperative during a mission.

Figure 5. Captain-side after-landing indication of the flight on August 5th

The maintenance record also says that on July 15th, 2010, the aircraft's engines were stuck by Timeres. It took crew members approximately 5 minutes to get rid of it.

1.6.2 In-flight Maintenance

To fix the inoperative systems caused by the attack of Timeres, in-flight repair was successfully conducted. All damaged engines and some parts of damaged hydraulic systems were fixed.

1.7 Weather

The weather condition in Brisun was given follow:

METAR PAUR 250730Z AUTO 30002KT CAVOK 15/M09 A2990

(Wind direction 300 deg, wind speed 2 kts, no cloud, visibility > 10 km, temperature 15 degrees, dew point 9 degrees, and altimeter 29.90)

The weather in the airspace where the accident took place was reported by following incomplete METAR text: *29004KTG11 OVC210 OVC280 16/M10 A2991*

(Wind direction 290, wind speed 4 kts with 11kts gust, overcast cloud at FL210 and FL280 (which covered the cruise altitude), temperature 16 degrees, dew point 10 degrees, and altimeter 29.91)

However, after Chtholly's scarification, the weather the automatic system collected became: *18012KTG15 SCT230 20/M12 A2989 BECMG FEW230*

(Wind direction 180, wind speed 12 kts with 15 kts gust, scattered cloud at FL230 (becoming fewer), temperature 20 degrees, dew point 12 degrees, altimeter 29.89)

1.8 Navigation Devices

According to the maintenance, the navigation devices are correctly installed. However, the left IRS became inoperative during the flight after crew members saw "strange lights". This will be discussed in following sections.

IRS device was found on board. Its components were destructed and analyzed. See Section 1.12.

From the FDR and CVR data, the right IRS worked properly. Both the ILS receiver on board and ILS device in the airport worked correctly, providing correct glide slope information, which helped the crew members a lot.

1.9 Communication

The communication between crew members and the ATC was loud and clear, which can be told from both CVR and ATC's tape record.

The transponder worked correctly and displayed 7700 emergency code for ATC in time.

1.10 Airport

The Brisun airport, or PAUR, had 2 runways:

- 35L / 17R Length: 7855 ft
- 35R / 17L Length: 6510 ft

The airport was also equipped with ambulance and fire fighters, which helped a lot during the evacuation.

1.11 FDR and CVR

The FDR and CVR were located at the tail of the aircraft. After the touchdown, the black boxes were immediately gotten and sent to BEA. BEA successfully downloaded some parts of data. However, some parts of the record are missing.

1.11.1 On Board Audio

Before the audio record started, following malfunctions had appeared:

ENG 1+2+3+4 SHUT OFF
ENG 2+3 LOW OIL PRESS
HYD 1+5 LOW PRESS
GEN 2 DRIVE[14]
L1+L2+R3 DOOR OPEN
CABIN ALTITUDE

APU had been started to power the airplane at that time.

18:36:11 *[Master Caution] Altitude*[15]*: 29195ft Airspeed: 243kt V/S: -1223ft/min*
ENG 3 Decompression Valve Drive … Why?
How can I die here!
S2 Put all materials here to fix this!
Altitude: 25838ft Airspeed: 271kts V/S: -753ft/min
18:39:13 F/O Gliding configuration established.
How long can we keep flying for if we still use these weapons?
CA I have no idea actually. Can you engage autopilot in this situation?
I'm still looking for my checklist.
F/O Roger.
AP2 engaged and set to V/S -800, ALT 10000 mode.
CA AP2, cross check.
18:40:02 *Altitude: 25033ft Airspeed: 260kts V/S: -799ft/min AP2*
S3 Emergency checklist of *(unreadable)* complete(d).
Start ignition.
S4 Ignition, roger.
Engine 1, 2, 3, 4 start valves open. N2 and N1 normally increased, and the FLT ignition was successful[16].
18:40:55 *[Master Caution] Hydraulic System 3,4 LO PRESS*
18:41:01 F/E Hydraulic 3,4 pressure low!
18:41:13 *AP2 disengaged.*
18:41:35 *Positive climb rate was first established.*

[14] *DRIVE* means a situation where a engine's generator is disconnected from the engine.
[15] The altitude is barometric value, and the airspeed is indicated airspeed (IAS).
[16] See Flight Data Recorder Data in the Appendix 1 to learn more.

Altitude: 24431ft Airspeed: 252kts V/S: +35ft/min

CA Switch to hydraulic system 2 and 6 …

F/O What? I have never flown airplane with so many hydraulic systems!

18:41:42 F/E Hydraulic 3,4 control valve STBY RUD.

18:41:59 CA Communication. Squawk 7700.

18:42:02 F/O Squawk 7700. You take control, I'll communicate.

18:42:09 CA I take control.

18:42:13 F/O Mayday, Mayday, Mayday, AF3403 *(unreadable)* …

18:42:33 AT AF3403, Roger Mayday. Say your intention.

Since the Mayday was declared, the ATC had been calling crews for further information, only to get no reply.

18:42:55 *[Another attack] [Master caution]*

The airplane started a sharp bank.

18:43:03 CA Hey, stable the aircraft!

18:43:19 F/O I've already done so!

The plane was stabilized again.

Altitude: 19323ft Airspeed: 299kts V/S: -331ft/min

18:43:53 F/E Hydraulic adjusted.

Another sudden attack.

18:44:03 CA What's that?

[Master Caution] Control valve 3 ~ 5 drive

18:44:32 F/E Control valve 3~5 drive!

18:44:38 F/E Control valve 7 is also driven!

18:44:43 F/O Be quick… Come with an idea to *(unreadable)*.

18:44:59 CA *(PA System)* Captain speaking. We're now trying to get rid of this airspace at a high speed. Hold other things firmly!

After that, the airplane made steep banks and dives.

Altitude: 20034ft Airspeed: 293kts V/S: +3349ft/min Bank: 16 deg

18:45:44 GPWS *Bank angle.*

Altitude: 24039ft Airspeed: 249kts V/S: +3122ft/min Bank: 31 deg

The GPWS alarm kept being triggered until 18:49:31, during which the aircraft reached the minimum altitude 19332ft, the maximum speed 304kts and the largest bank angle 34 deg.

18:46:02 CA Watch out the bank angle!

The plane leveled at 18:49:22.

Altitude: 23031ft Airspeed: 259kts V/S: +231ft/min Bank: 1 deg

18:50:11 F/O What was that?[17]

18:50:45 CA Maybe our soldiers. I don't know.

[Master Caution] IRS L FAIL[18]

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[17] That's probably when Chtholly started fighting. Here, eyewitnesses described "strange lights", which indicates the overuse of Chtholly's energy. See other parts of the report to learn more.

[18] Crew members point out that this warning message appeared as soon as the "insufficient precision" indication appeared on FMC.
In fact, IRS sprang to life a few minutes later.

18:51:03 CA My display become malfunctioning!
18:51:15 CA Switch IRS display to alternative display… What about your gyro?
18:51:45 F/O The same as the alternative one… Checked. IRS BOTH ON R, and do not engage AP.
18:52:01 CA Checked. Continue following preset right FMC route.
18:53:49 CA Look, it disappeared.
18:55:06 F/E Engines are now all recovered.
18:55:45 CA Are these hydraulic systems enough? I take control, and you communicate.
18:55:59 F/O You take control.
18:56:32 F/E Let me check the checklist… I think it's enough for landing.
18:56:39 AT AF3403, do you read me?
18:56:45 F/O Loud and clear, AF3403.
18:57:03 AT AF3403, say your intention?
18:57:24 F/O We have dealt with malfunctions… We request direct divert to the nearest airport, AF3403.
18:57:43 AT AF3403, Roger. Distract frequency 124.5 if you can.
18:57:59 F/O 124.5, AF3403.
The frequency was correctly adjusted.
18:55:34 CA So we still have doors open and separated…
18:55:52 F/E Affirmative.
18:56:23 AT AF3403, would you like to descend now or later?
18:56:53 F/O We need to descend now.
18:57:12 AT AF3403, Roger. Turn right heading 350, descend and maintain FL120, expected to land on runway 35L. The speed is on your own.
18:57:44 F/O Heading 350, descend to FL120, speed is on our own, AF3403.
18:58:32 CA Let's start approach briefing. The landing runway is 35L, direct approach, and the runway heading is 350. We'll use full auto brake and flaps 30. As for runway length…
18:58:59 F/O The runway length is 7855ft, just enough.
18:59:33 CA And go-around procedure…
18:59:55 F/O We will use WILAM1 procedure to climb and maintain 5000ft and join the hold pattern.
19:02:13 CA Seems difficult.
19:02:44 F/O Yes, but we don't have another chance.
19:03:01 CA So our first landing has to be successful. And for the MDA…
19:03:32 F/O 200ft.
19:03:45 CA 200ft, check. What about fuel?
19:04:11 F/E It's 54.1. It's enough and the gross weight is also OK.
19:04:33 CA Let's just try it. You are the pilot monitoring.
19:04:51 F/O You take control.
19:07:12 AT AF3403, descend to 6000, Brisun altimeter 29.90. You're at the runway heading. Contact Brisun approach at 115.25.
19:07:44 F/O *(To ATC)* Descend to 6000, contact 115.25, AF3403. *(To crew)* Descend and approach checklist: Compression is skipped. Auto brakes?

19:08:12 F/E Set to MAX.
19:08:33 F/O VREF?
19:08:55 CA 155kts.
19:09:11 F/O Approach brief is done. Altimeter?
19:09:33 CA 29.90, set.
19:09:45 F/O *(To crew)* Approach checklist complete. *(To ATC)* Brisun approach, AF3403, emergency aircraft, descending to 6000, expect runway 35L approach.
19:10:33 AT AF3403, radar contact. Continue descending. The speed is on your own. Can you tell me how many souls are on board?
19:11:01 F/O Roger… there are 449[19], AF3403.
19:11:12 CA Flaps 1.
19:11:19 F/O Speed check, flaps 1.
19:13:34 CA Flaps 5.
19:13:52 F/O Speed check, flaps 5.
19:15:03 CA Flaps 15, gear down.
19:15:33 F/O Speed check, flaps 15. Gear down, *(interruption)* three green.
19:17:31 AT AF3403, descend to 3000, report the field in sight.
19:17:55 F/O Descend to 3000, we'll call the field, AF3403.
19:18:11 CA Flaps 20.
19:18:34 F/O *(To ATC)* Brisun approach, AF3403, field in sight. *(To crew)* Speed check, flaps 20.
19:19:02 AT AF3403, cleared to land.
19:19:33 F/O Cleared to land, AF3403. We request ambulance and fire fighters after landing.
19:19:55 AT AF3403, roger.
19:20:11 F/O Landing checklist: Engine ignition?
19:20:33 F/E Set to CONT.
19:20:51 F/O Speed brake?
19:21:12 F/E Armed.
19:21:33 F/O Gear down, three green, checked. Flaps?
19:21:55 F/E 30, green light.
19:22:01 F/O Landing checklist completed.
19:25:15 GPWS *Minimums.*
19:25:33 CA Continue.
At 19:27:33, the plane touched the ground.
19:27:55 CA Speed brake…
19:30:02 F/E Full extended. Thrust reversers three green.
The plane stopped on the runway at 19:32:31. The CVR recorded applause.
19:32:55 AT AF3403, would you like to evacuate on the runway?
19:33:01 F/O *(To ATC)* Affirmative, AF3403. *(To crew)* Evacuation checklist: Park brake set, speed brake DOWN, flaps?
19:33:35 F/E Set to 40.
19:33:42 CA 40, check. Air valves open?

[19] At that time, crew members had known that a passenger fell out through internal audio, which wasn't recorded in the CVR.

19:33:53 F/E MAN and OPEN position.
19:34:13 CA Flaps 40, cross check.
19:34:33 CA Thrust levers? CUTOFF.
19:34:55 CA Cabin notification. *(PA System)* Captain speaking. Evacuate now!
19:39:12 F/O Is everyone evacuated?
Captain left and entered the cabin.
19:42:32 CA Yes.
19:42:55 F/O Let's go.
End of recording.

1.11.2 Soldiers' Audio

The Wing Force equipped soldiers with an internal audio system. Following text is what it recorded during the accident.

Following audio text is decoded from Chtholly's and Willem's audio recording device[20]. All records before 18:20 are corrupted due to unknown reasons, and existing records are cut to several pieces, among which are unreadable codes caused by probable radiology damage from the monsters.

W = Willem C = Chtholly Sx = Other soldiers U = Unknown

Incomplete segment[21]

C I felt like that something[22] is calling me under the ground.
(The ground broke down.)
- Discontinued audio component –
C What are you doing? It was a complete mass.
W Anyway, it's OK now.
S1 Escaping as soon as possible is better.
C/W Where?
S1 This channel must be the underground relic the idiot wants to look into. *(unreadable)* … Anyway, I have tagged along the way. Follow them and there won't be any problem unless it becomes discontinued.
C In the past, I could fly out.[23]
W Don't be worried. I'll protect you.
C But I hoped that I could have protected you.
W Anyway, I have the responsibility *(unreadable)* to do so.
C So I have been your … *(unreadable)*[24]

[20] When Chtholly fainted, the text uses Willem's record; When Willem was falling, the text uses Chtholly's.
[21] Incomplete segments were recovered from the seriously broken audio device. Investigators can't be sure about the timeline in this part.
[22] Maybe "someone".
[23] See Section 1.17.5 to learn leprechauns' abilities.
[24] The word is likely to be "wife".

- *Discontinued audio component* –

C So, is it OK to go through that direction?

Segment 1 (Starting at 18:17)

W Chtholly?

Hey, Chtholly?[25]

C *(Hesitant)* Wi..llem?

W It's me. Come on!

S1/W[26] Don't lose yourself!

S1 I haven't considered that I can see this treasure twice in my short life of our race *(unreadable)* …

How poor! Seriously cut.

U Seniorious' charm? What's that?

S1 Do you know the charm which turns princes into frogs in fairy tales? That's similar.

(A short silence. During the conversation, the breath of Chtholly weakened.)

That's a charm through which turns anyone into the death, even god, and it's for this reason that the sword is believed to have the power to change the whole world[27].

This suggests that she is not a simple girl.

Segment 2 (Starting at 18:20)

(Stone or ice crashing.)

W Chtholly, let's go back.

Listen! Just keep awake.

W Chtholly!

I promise I'll save you.

C *(Very weak)* Willem…

(The breath of Chtholly became beyond recognition.)

W I'm here. I'm always beside you.

C Emm… I *(unreadable)*…

S1 Willem, this direction! Be rush!

W Chtholly, Chtholly! Please … response!

Segment 3[28] (Starting at 18:23)

(Shooting from unknown source.)

U[29] Welcome back, Chtholly.

U I have something to tell Chtholly, *(unreadable)*.

---

[25] Original text is in Japanese.

[26] The identity can't be told (so are following symbols like this). This is because Chtholly's signal was influenced.

[27] This part is newly encoded, compared with the former report.

[28] This segment is covered by waste data. Therefore, the decode result might be incorrect.
The voice is weak, with an average strength of -82dBm. Its frequency is higher than the listening range of normal ears.

[29] A young girl's voice. It can be inferred from the context that she was Elk (see the conclusions below).

C What?[30]

U Once upon a time, there is a species called “human beings” living on the ground. To stop their deconstruction, 3 gods and goddesses decided to remove them, but they were defeated. No one could stop humans from then on, and evolution gradually took place, turning them into monsters, ruining everything *(unreadable)*,

And the last goddess is called *(interruption)* … Elk Hallksten. This is also the name of *(interruption)* … your soul.

(Something flying.)

U You and your friends are souls whose owner died too young to realize their death … I’ve been having dreams since my death, *(unreadable)* like her.

C So what will I be turned into?

U You must have realized, *(interruption)* Ah-huh?

Dreams have endings. *(unreadable)*

C And (they’ll) be forgotten, with nothing remaining?

U You managed to return before the last moment.

Segment 4 (Starting at 18:25)

W Chtholly, I just wanted to let you *(unreadable)* …

S2 Maybe you have never thought about her. You didn’t stop *(unreadable)*, thus, you will be sympathetic like this … *(unreadable)*, making you make such a commitment.

W No, I just wanted to let her *(unreadable)* … I didn’t make it. *(About crying)*

(Exploding)

W *(unreadable)* Regardless of your identity, I’ll use my energy of anger.

Segment 5[31]

U Your thought seems to be remained, doesn’t it?

C Yes. A little (thought remains)[32].

U That’s doesn’t matter. Then Chtholly remains.

(A short silence.)

C Willem…

Segment 6 (Starting at 18:32)

W I have lost almost everything from my *(unreadable)*… I can’t get them back. The only thing I can do is to fight. *(unreadable)* What was I doing?

(A mess caused by a sudden attack) *(Willem running)*

We Are Noft and others OK?

S3 I just saw them fighting against Timeres. I guess others are protecting crew members.

(Willem walking away)

S3 Hey, how was your wound there?

[30] Unexpectedly, her voice was clear in this text, in spite of her breathless condition in the previous segments.
[31] Segments 4 and 5 were recorded at the same time. Segment 4 was Willem’s, and the other was Chtholly’s.
[32] This means abbreviations of speakers.

(Willem fainted but was alive. Following conversation took place after Willem's recover)

W How long has it been since I fainted?

S3 A few minutes. You're putting yourself in danger if you continue to fight with such wounds.

(Unreadable) Fighting against Timeres without swords? That's almost impossible.

W I adjusted myself to the best status among almost all soldiers. Yet this makes me unable to hold anyone's hands[33].

Segment 7[34]

U *(unreadable)* No way!

C I remember my commitment… I said I'll inherit his responsibility.

U I've said there's no way.

C Please… *(unreadable, weakened)* and I have something to tell him.
Whatever it turns out, I want to do it.

U But Chtholly will completely disappear after that if you try this, uh-oh. It consists of memories, sweet feelings, etc., all of them.

C *(Calmly and firmly)* But I hate this ending more than disappearing.
So, please, let me get back.

(Something flying, Chtholly's breath recovering)

Segment 8[35] (Starting at 18:37)

S5 Hey, f**k, since you've woken up, find somewhere to hide!
(Chtholly stepped forward, regardless of her advice.)

S5 Stop, Chtholly! Since you can quit, don't take part in this fight!
Since you can get your happiness, go to get it!

C I'm sorry… I can never get more happiness. Because… *(interruption, during which Chtholly jumped down)*
Actually, I've been surrounded by happiness.[36]

U[37] *(unreadable)* Come on, Chtholly!

W Chtholly?

[End of both Chtholly's and Willem's recording.]

Further audio is in chaos.

1.12 Wreckages

Wreckages were correctly collected and divided into several parts. Almost all of components were found, but three doors and fuselage nearby were missing. Rescue team found these parts in the area where the accident took place later. The mean distribution as well as the flight path is given below.

[33] This probably means that he failed to save Chtholly.
[34] Segments 6 and 7 were recorded at the same time. Segment 6 was Willem's, and the other was Chtholly's.
[35] Since Willem's recorder had been damaged, Chtholly's is used here.
[36] At that time the airplane was 27,107 feet to the ground. See Section 2.6.2.
[37] This voice was as weak as previous weak segments. It can be inferred that she was Elk.

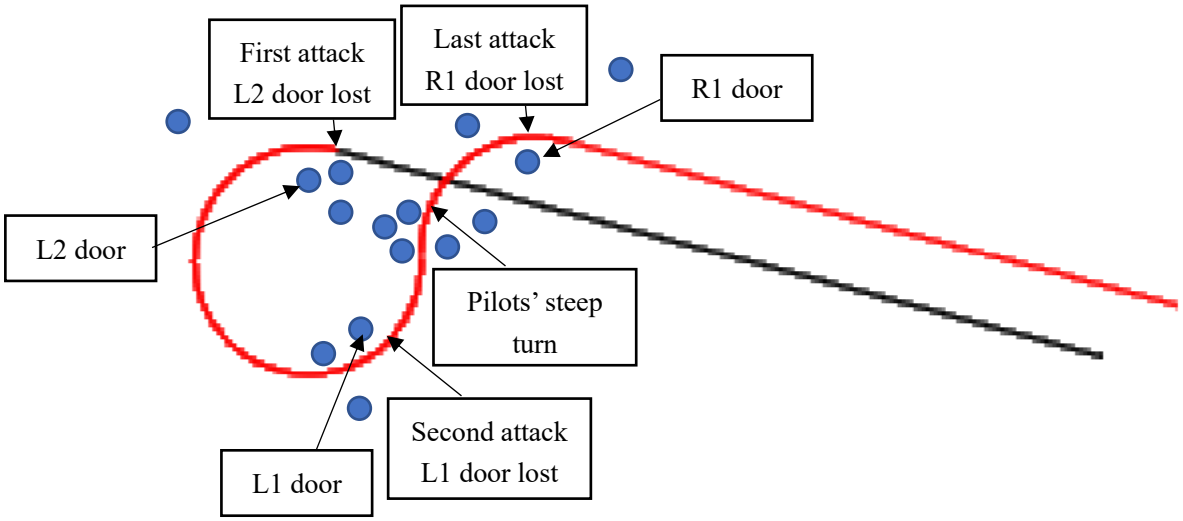

Figure 6. Mean flight path (with FDR and ATC data) and wreckages' distribution

●: Where fallen fuselages were found.

1.12.1 Wreckages of doors

There is an obviously metal transfer between the originally found components and the separated ones, which should have been connected to each other. For example, the figure below shows a picture of the locker of one of the doors flown away:

Figure 7. The metal transfer of the locker (the left-bottom part)

From the circumstances of the borders of the metals, the in-flight situation of the door is inferred as follows:

Figure 8. Simulated situation of L2 door, with a normal man standing behind

Figure 9. Inside view of Figure 3-1

Figure 10. Simulated situation of L1 door, with a leprechaun struggle not to fall down

1.12.2 Wreckages of IRS modules

Figure 11. Destructed IRS components

IRS components are generally complete, but investigators have found small cracks from the outer container.

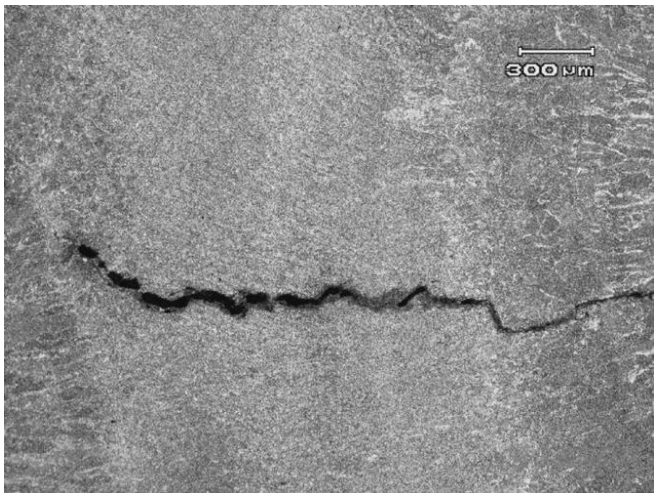

Figure 12. Cracks found (under microscope)

1.12.3 Wreckages of Engine Structures

The engine structures were generally complete, thanks to the in-flight repair work.

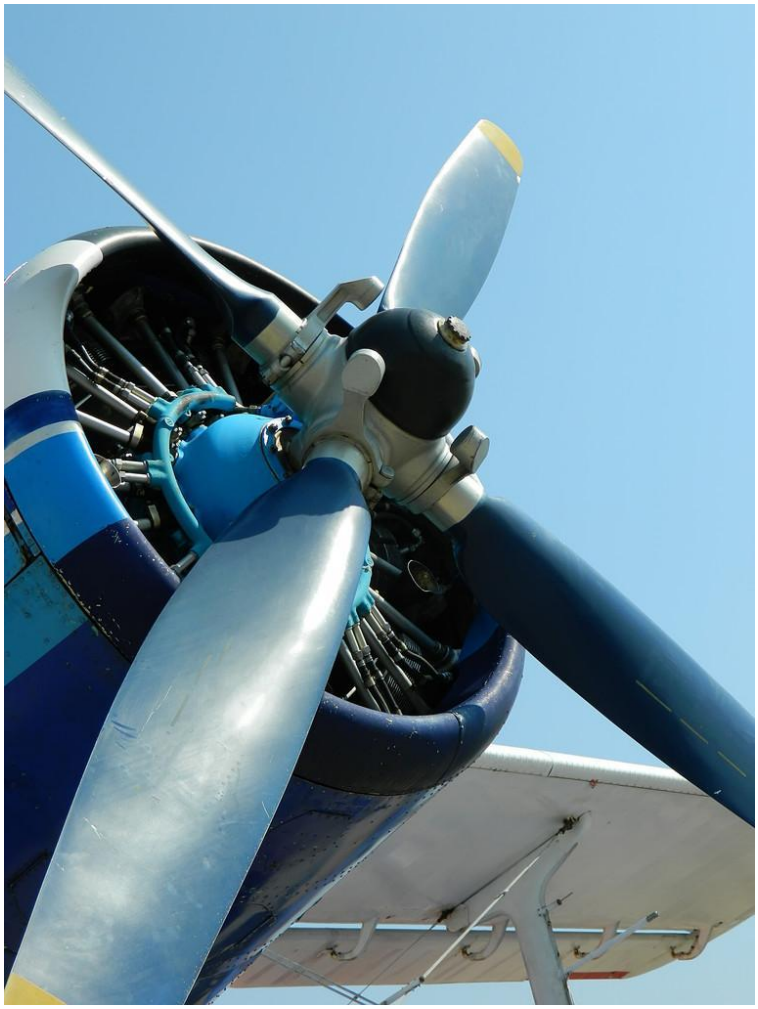

Figure 13. Engine (after touching ground)

The structure of the turboprop engines can be described as:

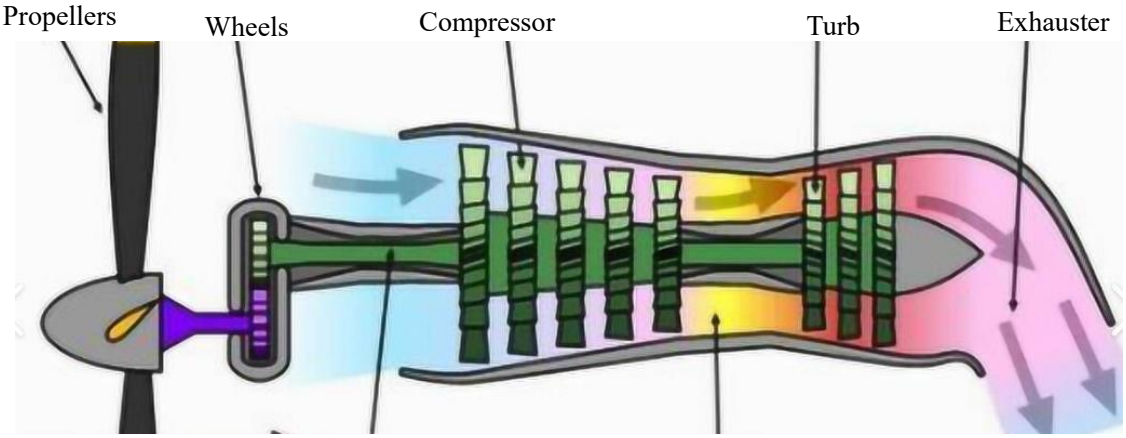

Figure 14. Engine Structure

During the analysis, investigators found that the areas near exhausters were black, suggesting

high temperature.

1.13 Medical Analysis

1.13.1 Medical Analysis Before the Accident

Several days before the battle, it was reported that Ms. C. N. Seniorious, a soldier in "special battery", had her hair redder than it should to be after the previous failed battle over the 15th region[38]. Further examinations through the dissolved Ag^+ indicated that she wasn't suitable for fighting at that time. In view of this change, the central command let her take over a secretary position.

The only differences among the substances of blood and other body liquid are the existence of NO_2^- and the concentration of H^+.

After her body was found by rescuers, the substances of blood were immediately tasted. Experiments on Chtholly's body indicates that her blood had $c(NO_2^-) = 9 \times 10^{-6}\ \text{mol/L}$, $c(NO_3^-) = 8 \times 10^{-6}\ \text{mol/L}$, which means $c(NO_2^-) = 1.7 \times 10^{-5}\ \text{mol/L}$ during her last moment.

Zoology experiments have shown that her ion channels are more activated than usual during her last moment.

1.13.2 Autopsy Result

Chtholly's body was generally complete after being found, though some fingers had lost. 4 ligature marks were found. Large sizes of bruises, which covered a total area of $650\ \text{cm}^2$, were also found. Internal organs were found broken and there was significant sign of internal bleeding. 12 internal fractures were also found. Following table provides more information:

Name	Position	Size	Remarks
Ligature 1 and Bruise 1	The whole left leg	Approximately 67 cm	
Ligature 2 and Bruise 2	Part of the right leg	Approximately 12 cm	
Ligature 3 and Bruise 3	Part of the left arm	Approximately 9 cm	
Ligature 4 and Bruise 4	Near neck	Approximately 15 cm	Fatal[39]
Bruise 5	Back area	Approximately $122\ \text{cm}^2$	
Bruise 6	Waist area	Approximately $44\ \text{cm}^2$	

[38] See Section 1.5.2.
[39] The result wasn't directly shown during the battle, but caused breathing problem later.

Internal organ broken	Kidney area	/	Fatal
Fracture 1[40]	Ribs		
Fracture 2	Ribs		
Fracture 3	Ribs		
Fracture 4	Left finger		Minor
Fracture 5	Left finger		Minor
Fracture 6	Right finger		
Fracture 7	Right finger		
Fracture 8	Right finger		
Fracture 9	Leg bone (upper part of left leg)		
Fracture 10	Ribs		
Fracture 11	Ribs		
Fracture 12	Ribs		

1.14 Fire

There was no fire alarm triggered during the accident, nor there was any sign of fire in all wreckages.

1.15 Search and Rescue

As the crew members required, ambulances and firefighters had been ready before the aircraft landed. The central command attached much importance to this battle after the deaths and injuries were reported, and a rescue team was immediately sent to search for missing soldiers and wreckages. All injuries were treated as much as the hospital can. All of them were saved at last.

After landing, it was reported that Mr. Kmetsch and Ms. Seniorious were missing. Since the threat no longer existed, helicopters for rescue work started to hover above and immediately sent a rescue team. Also, Ms. Seniorious was found dead 2 hours after the rescue started near the cliff. Mr. Kmetsch wasn't completely found, although several small skin parts of his body was found.

2 days after the rescue started, all wreckages were collected. However, Willem wasn't found. The rescue work ended 8 days after the rescue started, for it's impossible to find him alive in such a condition.

The only death is Chtholly Seniorious. Willem Kmetsch and Nephren Lukh Insania is still lost so far.

[40] A broken surface is considered a fracture. Therefore, a bone might be counted more than once.

1.16 Experiment and Research

1.16.1 The Strength of the Doors

Investigators used a simulated door to see whether the door will be unlocked (can be opened with force of the pressure inside out) after being hit. A hard electronic spring ($k = 2 \times 10^6$ N/m) is used to control the force on the panel. The result is given below.

Test #[41]	Length of the spring (m)	Separated %	The average number of broken locks (8 in total)
1	2	0.9	0.4
2	2	2.5	1.6
3	4	15.3	3.3
4	4	63.4	4.6
5	6	71.2	5.1
6	6	74.5	5.4
7	8	79.4	6.3
8	8	81.2	6.4
9	10	88.2	6.4
10	10	88.5	7.2

1.16.2 The Malfunctioning IRS System

It has been discovered that leprechauns may produce strong electric field. To test if this will influence the IRS, following experiment is conducted:

- Investigators put a micro vehicle on the desk, delivering the IRS component. The IRS component is then connected to a computer dealing with its output.
- Let the vehicle move towards a direction at a constant speed.
- When the speed became stable, an electric field was added, and the output was observed.
- The experiment was redone for many times, changing the direction of the movement and the electric field. It can be observed that the heading always turned towards the opposite direction of the electric field, regardless of actual heading. However, when another IRS from a new aircraft was used in this experiment, the IRS stayed operative.

However, when the malfunctioning IRS is connected to an actual aircraft's systems, which is completely manufactured by Boeing, with such a condition, there's neither FAULT indication nor "HDG" (as well as "ATT") error flag. The only indications are CAP-F/O disagree alarms and "UNABLE REQD NAV PREF" on FMC, suggesting insufficient precision. The similar phenomenon only appears on The Wing Force's own aircraft systems.

[41] Different sides of doors were used.

1.16.3 Flight Simulation

By analyzing the FDR data and compare it with simulated extreme situations, the investigators agree that there are some movements such as steep turn, climb and descent that couldn't have been done by crew members.

During the simulation, investigators also find that if a small hole near key positions (including the connection, the gate, etc.) and the difference of air pressure keeps existing, the things nearby are likely to be blown away. This can be solved by an active decompression and emergency descent.

The investigators have conducted following tests to find out the best configuration of landing with similar fuselage damage:

Test #	Flap position (deg)	Touchdown IAS (kt)	Result (Success / Total)[42]
1	0	195	0/8
2	1	185	0/8
3	2	175	1/8
4	5	170	1/10
5	10	165	2/10
6	15	160	3/12
7	20	155	5/12
8	20	150	8/12
9	20	145	4/12
10	30	155	10/12
11	30	150	9/12
12	30	145	8/12
13	40	155	9/12
14	40	150	9/12
15	40	145	6/12

Also, investigators have tried in what circumstance the IRS will present such a FAULT state. The simulation shows that it shouldn't have taken place, but in a real Wing Air Force's adapted A400, the problem remains.

1.17 External Information

1.17.1 The Reason of the Flight Being Scheduled and External Information about Chtholly

The battle this report investigates took place on the ground, in a place which is currently called the Chthollyfield[43] in memory of the soldiers.

This battle was indirectly caused by another investigation project started by the former Mr.

[42] Success means the aircraft successfully lands with no payload lost in restricted acceleration.
[43] See further sections.

Kmetsch (William Kmetsch; Willem Kmetsch) in order to find out the source of monsters by looking into human civilization[44] by investigating an underground relic site. However, during the discovery, the wall of the cave they were in crashed. While they were struggling to escape, Ms. Seniorious seemed to be attracted by something and she rushed towards another direction. At the end of the cave, at that direction, there was a frozen body, which was further recognized as Ms. Elk Hallksten[45] (or a statue). Seeing and touching frozen ice nearby, Ms. Seniorious's hair grew redder until it became completely red. She soon fainted and was carried back to the aircraft by Mr. Kmetsch, with weak breath and ECG indication. This circumstance kept for about 26 hours, during which the aircraft joined the holding pattern in the area to conduct more investigations.

1.17.2 Monsters such as Timeres

Monsters such as Timeres are aggressive creatures living on or under the ground. When they are awaken, they will climb into the air. They are so full of strength that they can easily destroy many kinds of structures. Following pictures show the photos taken by on-board camera during the accident.

[44] Ancient form of current men.
[45] She is believed as a former goddess, as known as Eliza/Eruku.

Figure 15. Timeres breaking through the fuselage and entering the cabin

Figure 16. Timeres sticking into the engine (These two pictures are photographed by a leprechaun)

1.17.3 Colored Chtholly

Figure 17. Chtholly whose hair had 2 colors

Chtholly's hair had 2 colors, blue and red, before the accident. It is reported that the change of color started from the end of the hair.

After her body was found by rescuers, chemical experiments were conducted. It showed that her hair had litmus.

1.17.4 Geographical investigation on and under Gamagu

The ancient construction of the Gamagu city has been seriously damaged by the Timeres and the fallen fuselage. Investigators tried to recover the situation on ground.

Figure 18. Broken buildings (recovered simulation)

Figure 19. Simulated original situation on the ground of Gamagu

The detail of the underground part is still unknown, since it's too dangerous to investigate this area. However, the frozen body has been confirmed. For safety reasons, it was kept frozen. However, through X-Ray and other skills, investigators have confirmed that the body was a true one.

The composition of the underground part was also taken. Further chemical tests suggest that it contains a large amount of $CaCO_3$.

1.17.5 Leprechauns' information

Leprechaun is a race. They often have a sword to control and wings to fly, although its detailed factors are still unknown, while the connection between the ability and the NO_2^- has been confirmed by former investigations. However, before the accident took place, Chtholly had lost her ability to fly for a long time, while this ability recovered during the accident. See Section 2.

Figure 20. Standard flying situation of leprechauns, which was photographed by internal camera in the cabin

Besides, it has been seldom reported that the erode take place. Most of the eroded ones failed to recover and soon died, but some of them successfully recovered. One of the success examples is Ms. Vaarugarisu[46] in our investigation team, but she couldn't remember anything else special besides keeping and reading her own diary. This showed few contributions to others' recovery.

Leprechauns also have the ability to open the "leprechauns' gate", with their lives as cost. There have been records about that:

[46] As known as Ms. Vulgaris.

*Figure 21. The situation of opened Leprechauns' Gate, provided in the former report **WF-A-2213.3** (May 1982)*

Aircraft's camera also captured similar situations when Chtholly was almost burning herself to fight:

Figure 22. The situation captured by the aircraft's camera (1)

Figure 23. The situation captured by the aircraft's camera (2)

2 Analysis

2.1 Crew Members

Generally speaking, the qualification of the team was excellent, and they had the ability to finish the flying task and deal with the problems.

Both the CVR and FDR suggest that the crew members correctly carried out the checklist. However, the procedure they follow can be improved. Following sections will discuss this.

However, the decision of stopping using AP because of malfunctioning IRS may cause much trouble to their emergency procedure, although they succeeded without using AP after that.

According to the CVR, the CRM is that the captain worked as PF and the first officer worked as PM. This is an outstanding decision since the captain was skillful.

2.2 Planning

The plan of investigation led by Mr. Kmetsch had been granted by the central command 9 days ago, with no extra change.

However, the plan didn't mention transportation. Therefore, the central command and dispatch assigned several new pilots, some of whom hadn't completed complete training at that time, to deliver them. This might have caused the part of the accident.

What's more, no forecast system of monsters such as Timeres could be used, nor was statistical results of Timeres. This made it impossible for them to consider the safety.

2.3 Physical, Chemical and Biology Analysis (Towards Chtholly and Leprechauns)[47]

2.3.1 Chemical Analysis: Substances of Chtholly

It should be clear that leprechauns are virtual beings which are caused by the world's "pointer error".[48] More detailed, they are created from early died souls. It used to be believed that the souls can only be normal people's. It is measured that this connection is implemented by H^+ (but not spent), while the force it brings comes from spending NO_2^-, which are the only differences of substances between humans' and leprechauns'.

From this, we can say that the key difference between other creatures and leprechauns is H^+, because it indicates how leprechauns suppress their connection to their ancestors to stop being eroded, while others needn't. As for NO_2^-, it might be introduced to increase the pH of leprechauns and increasing their ability to fight is probably an unexpected effect.

[47] This part is finished by the Global Chemicals' Conference.
[48] For its detailed reason, see **WF-B-37.1**, **WF-B-37.2** (January 3, 1979) and related reports.
For its detailed influences in this event, see following sections.

In Chtholly and other Leprechauns, following balance exists due to this feature:

(In the whole body, especially blood):

$HNO_2 \rightleftharpoons H^+ + NO_2^-$, where $K_a = 5.6 \times 10^{-4}$ in normal world. This reaction is also used to balance pH in their body.

During fighting, NO_2^- is spent too fast, and to support the balance, more H^+ is produced, causing stronger connection, and leading to the erode. This can also show how Chtholly is "enhanced": The K_a or the concentration of HNO_2 was probably adjusted to increase them at the same time.

As for Chtholly, her hair had litmus, which presents red when pH < 5.0 (others may have different indication or no indication).

Generally speaking, while $c(NO_2^-)$ it became higher, $c(H^+)$ had also had a fatal increment. More fatally, when NO_2^- is spent, $c(H^+)$ is expected to continue growing, leading to her disaster. When the concentration values of HNO_2 and NO_2^- is confirmed, the pH diagram of the balanced state is shown below:

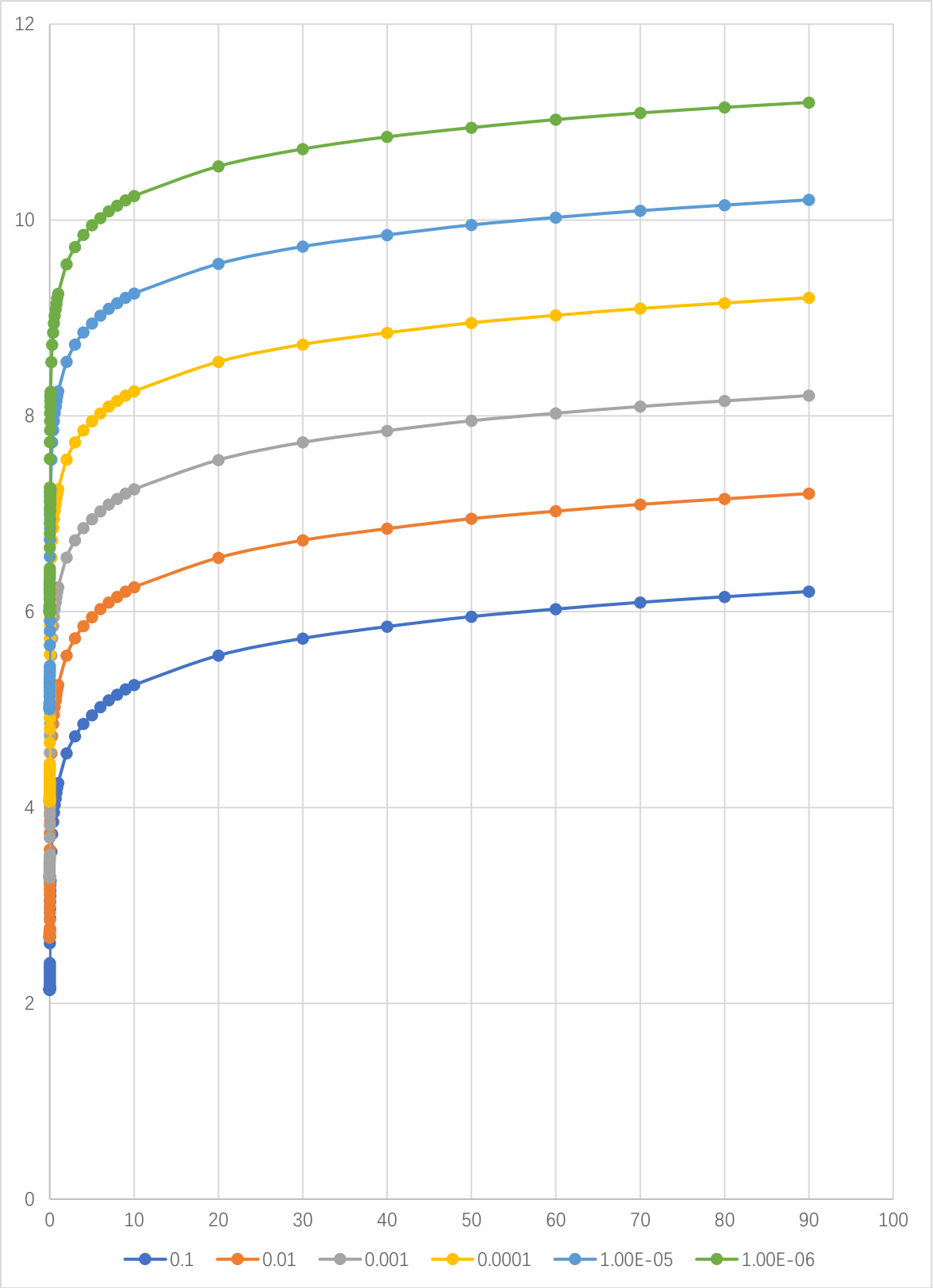

Figure 24. The result pH after the balance (The detailed graph can be seen in the appendices)

Some factors increase the K_a and make the erode easier to happen. From Chtholly's experience, we can infer that anxiety might cause this. Other factors, however, remain to be seen.

There have been many reports saying that the Chtholly's "red move" is a long-lasting process, and it sometimes stops. Regardless of its verbose process boosted by many factors, it can be like:

$$\text{Chtholly(s, Blue)} \rightleftharpoons \text{Chtholly(s, Red)} \qquad \Delta H < 0, \Delta S < 0$$ [49]

The enthalpy change is inferred because when she touched ice pieces, her temperature dropped, making the balance moving towards positive direction, therefore, the positive reaction inhales heat.

This also matches the experimental result, as an examination returned negative result of Ag^+, which is described in the Section 1. We can know that it's because:

As for AgOH, its $K_{sp} = 2 \times 10^{-8}$[50], coming with following balance:

$$\text{Ag}^+(\text{aq}) + \text{OH}^-(\text{aq}) = \text{AgOH(s)} \qquad K_0 = 5 \times 10^7$$

Thus, when balanced,

$$c(\text{Ag}^+) = \frac{K_{sp}}{c(\text{OH}^-)} = \frac{K_{sp} c(\text{H}^+)}{K_w}$$

When pH=8, or $c(\text{H}^+) = 10^{-10}\ \text{mol/L}$, we have required $c(\text{Ag}^+) = 0.02\ \text{mol/L}$. This shows why the test is sensitive. However, to effectively tell high pH creatures like leprechauns from normal pH creatures (whose pH is usually 7.5), the concentration should be lower than 0.5. When pH=4, the required concentration was $c(\text{Ag}^+) = 200\ \text{mol/L}$, which is next to impossible. Since the result turned out to be negative, it can be inferred that Chtholly's internal pH value had been lower than this value ever since.

2.3.2 Zoology Analysis

The result of the ion channels might be because her anxiety, but this might also relate to the erode.

As for her recovery, both the factors above and the hypoxia the low air pressure might have caused this.

2.3.3 Physical Analysis

From the aviation analysis we can know that when Chtholly jumped down, she was at approximately 27,107[51] feet above the ground. According to the weight data of her body 49.15kg, the latest Willem's weight data 63.4kg and the woman 40kg, the total gravity potential energy was approximately 1.2×10^7 J. No one can suffer from such a hit, but the force was almost all suffered by Chtholly. This indicates that something must have "enhanced" her and she had also overused her energy.

The energy Chtholly released not only worked as electric field. The sudden rise of the air temperature and the sudden change of the wind direction suggests the work to the air. This also

[49] Obviously, Chtholly is a mixture of substances. Here they're shrunk.
[50] See https://owl.oit.umass.edu/departments/Chemistry/appendix/ksp.html to learn more.
[51] See the FDR data in the Section 1.

shows how strong the force was.

2.4 Risk of Monsters and Geographical Environment

Plan revision had confirmed that the area is not at high risk of monsters at that time. Therefore, the sudden appearance of Timeres was an accident, although it seems to be related to Chtholly's relationship.

It can now be confirmed that they were in a Karst landform hole. That's why the construction easily fell.

2.5 Audio Record and Its Analysis

2.5.1 CVR Audio

The audio at 18:36:11 suggests that the crew members are not calm enough. This is probably because the first office wasn't experienced enough. This wasted their time, but not too much.

The checklists were correctly followed and executed during the accident. For example, "Hydraulic 3,4 control valve STBY RUD." is what the checklist requires.

The approach method they selected was also corresponding. Generally speaking, the audio shows the excellent cooperation among crew members. See following sections to learn more about their CRM.

The crew members were responsible for their passengers. However, what was regretful was that they didn't notice that someone had lost. Anyway, their performance was still outstanding.

The alternative systems worked properly, and the performance of these systems were correctly monitored and considered by crew members.

They made a decision about how to land with some parts of fuselage missing. They selected flaps 30, which has been proved to be one of the best solutions.

2.5.2 Chtholly's and Willem's Audio

Following statements can be inferred from the audio.

Conclusion to the discontinued segment: The connection between Chtholly and her former soul, Elk, was strengthen as their physical distance got closer. This kind of connection often had unexpected results and power. In this example, it is inferred that the Timeres' appearance was partially because of this, but there's no evidence strong enough so far.

Conclusion to segment 1: It can be inferred from the audio that they were talking about Elk. Therefore, the probable origin of Chtholly was her. This can also be inferred from further audio.

The "Seniorious" might refer to Chtholly, but might also refer to the sword, or both of them. This also proves the connection between them.

Conclusion to segment 2: The cave was ruined and Chtholly was dying.

Conclusion to segment 3: It can be sure that Chtholly's soul came from the former goddess Elk. This can explain Chtholly's erode, sword match, power, etc.

This also suggests the final source of all Leprechauns.

The meaning of the described history remains to be seen.

Conclusion to segment 4 and 6: This shows Willem's courage and determination.

Conclusion to segment 5 and 7: It seems that the former souls can communicate with Leprechauns in this case, and from this conversation, it can also be inferred that the erode is controlled by the former souls.

These kinds of conversation can be recorded but can't be cut in. Probably, they can help with Leprechauns status' analysis and diagnoses.

Conclusion to segment 8: From this segment, you can see the very complete representation of Chtholly's courage and determination. Her power also seems to be boosted and enhanced, probably by Elk.

According to eyewitnesses' accounts, the chaos is about how Chtholly fought against the Timeres. This also indicates her admirable and outstanding courage and determination.

2.6 Mechanical Analysis

2.6.1 General Damage to Fuselage

When the aircraft touched the ground, it was immediately examined by investigators. Investigators found that the door L1, L2 and R3, as well as the fuselage nearby (extended for about 40cm to 60cm), were missing.

The major damage is caused by monsters' attack. During such attack, the fuel pumps and pipes were damaged, making the engine inoperative. The engine was qualified in this situation because neither fire nor smoke was caused in spite of the extreme damage to the oil pipes. Hydraulic systems were damaged in the similar ways. Since the whole fuselage had been broken, damage was completely unavoidable.

During the malfunctioning of the control systems, the alternative systems perfectly worked, pulling the airplane out of danger with the correct control of crew members.

The damages caused several passengers' fallout. They were sucked out through the holes by the air pressure.

2.6.2 Damage to Doors

Analysis to wreckages collected from the location where the aircraft was when the cabin

altitude alarm was first triggered suggests that the separation of fuselage was caused by a strong force through the paint and metal transfer detected[52]. This suits the result of Timeres well.

However, even though the fuselage was under such a pressure, it should have not broken apart. Examination has proved that this is because when a strong force is given, the locker of the door first breaks down, making the door blown away because of the difference of the pressure (See the image below).

Figure 25. The broken locker and its structure (Simulation)

More detailed, the force inside out is

$$F = pS \approx 4.8 \times 10^6 \text{ N}$$

With $\Delta P = 487.6$ hPa.

Therefore, the force outside in the locker can suffer is only approximately 3.2×10^6 N, with the total square of the door is $200\ \text{m}^2$. The force is suffered by Aluminum covering $0.01\ \text{m}^2$ after two third of the structure is damaged, which means 320 MPa, a value much greater than this kind of material can suffer[53], so there's no doubt that the door will fly away.

Besides, the connections of the fuselage are connected through rivets. With the part of fuselage breaking down, other parts become unstable and easier to fall. Therefore, much more trouble than it should have been was caused by the separation of the doors.

2.6.3 Damage to IRS

The failure of the IRS was probably caused by Chtholly's action. Her energy came out in such a high speed that was high enough to influence devices nearby. This can be proved because the time the IRS failed matches the time Chtholly started her fight.

The failure suggests that the electrostatic shielding no longer works. By examining the IRS module, investigators discovered small cracks near screws, which are large enough to destroy the shield. Therefore, the module used to detect acceleration suffers another force from electric field, making the result incorrect.

The analysis to systems points out that the IRS failure indication of overhead panel and front PFD directly comes from IRS insufficient precision output, and once IRS is considered failed, all displays are hidden by the adapted PFD. This can explain why IRS was considered failed in flight,

[52] See attachments.
[53] The maximum pressure this kind of material can suffer is approximately 290 MPa (6061-Type).

and this means that once IRS gets influenced, all information it presents becomes inaccessible. This is a bad way to deal with people-objects and objects-objects relationships.

2.6.4 Damage to Engines

The turboprop engine is sometimes unreliable, especially in this case. When monsters come, the engine might be stuck by them with the fuel still being burnt, and no adjustment in the cockpit can be done to solve this other than shutting down the engine, causing the loss of power, although soldiers directly killed the Timeres on the engine in this accident. In this case, the Timeres probably blocked the exhausters, causing the engine to be overheated.

It will be easy for engines to be overheated and even on fire. In this case, jet engines are safer, because their exhausters can't be easily blocked, and a jam is less likely to occur.

2.6.5 Damage to Hydraulic Systems

The hydraulic pipes after the adaption are just close to the fuselage. When the door broke, it hit the other parts of fuselage, causing these pipes to deform and leak. Steep input sped up this kind of leakage.

2.6.6 Other Systems' Damage

The autopilot could and should have worked longer after the IRS sprang to life so that crew members would have more time and chances to adjust other systems to better situation. The closure of the autopilot was based on both the program and the procedure.

2.7 Configuration of the Aircraft

From the experiment in Section 1.16.3 we can know that the 30 deg flaps configuration is approximately the best configuration. This is probably because when the speed is too fast, the structures next to the cracks can't suffer or stir up the air, and the aircraft is at the risk of overspeed; when the speed is too slow, the aerodynamic performance is also influenced, and the aircraft is at the risk of stalling.

The high speed also causes its payload to fall.

In some cases, the broken fuselages stop the flap from reaching the correct position when the flap extends to 40 from 30 by blocking control pipes.

2.8 The Way in Which Leprechauns Fight

It has been said that Willem taught leprechauns, especially Chtholly, a new method, in which they don't have to give up their own lives. This method has partially been proved effective, which

can be seen from the recent performances from the leprechauns[54]. However, with more efforts like what have been done in this case, the effect can be more significant.

Besides, whether it's worthy, reasonable and valuable to sacrifice leprechauns, remains to be seen, as it is still the most efficient way to defend.

3 Conclusions

3.1 To the Crew Members

Both the aircraft and the crew members did the right thing well in the accident. The outstanding technique, calmness and courage of the crew members are inspiring.

The decision to protect the engines made by crews are correct and worth learning from.

Crew members' decision to start a steep bank was effective, but also brought negative effects. Their landing configuration was correct and outstanding.

3.2 To the Design of the Aircraft

The structures of the fuselage were damaged by both the Timeres' attack and the locker itself. Therefore, the strength of the fuselage, especially the locker, can be improved. Iron or other strengthened materials are recommended to replace current Aluminum material, which is too weak under such a condition. Its related electronic switches should be replaced as well.

The IRS module should also be strengthened rather than dismissed. When it comes to another accident, the IRS failure may be fatal. Also, the malfunctioning input should no longer come from the IRS insufficient precision output.

The turboprop engines are also unreliable. They're at risk of being stuck.

3.3 To the Procedures

The procedure dealing with IRS failure can also be improved. More detailed, the leprechauns and the Timeres should be taken into account. More detailed, pilots should not turn the switch to ATT mode too early and they may retry later.

The checklist to follow when parts of fuselage are lost should also be given.

3.4 To Chtholly

It can be inferred that Chtholly is probably the virtual descendant of the goddess Elk, which not only gave her ability, courage and determination but also eroded her, and all of them were boosted by the encounter. Whether it's true, as a soldier, she did a lot more than she was required and fought until the last moment. She killed all Timeres, making hundreds of cities are no longer

[54] See **WF-A-31235.1**, **WF-A-31235.2** and **WF-A-31236.1** (January 2011).

threaten. It was the overuse of her energy during this fight that finally caused her heartbreaking death. Her courage and determination were inspiring.

The way to evaluate Chtholly's and other leprechaun's health and ability has also been confirmed.

According to eyewitness' accounts, Willem also fought until the last moment, opening the Leprechauns' Gate and giving up her own lives. Although he failed to plan the transportation correctly, which indirectly made a difference to the accident, he is also worth learning from.

What's more, Chtholly's connection to the Elk might have another aspect. The sword Chtholly suits probably killed her hundreds of years ago. The effect of this kind of mixed connection might caused such a complex result. However, how it works in detail remains to be seen.

3.5 To Commanders and Dispatch

The commanders failed to forecast the Timeres' appearance, leading to the accident. However, in no way could they have made the correct forecast, so it's not their responsibility. Generally speaking, the instructions were correct and effective.

They successfully carried out rescue work after the battle, so their work still worth receiving positive words.

4 Recommendations

4.1 To the Aircraft

Firstly, the material of the door locker should be changed to more reliable ones. The connection between the door and the other parts of the fuselage should also be strengthened. The position of hydraulic pipes and other important control pipes should also be adjusted to avoid malfunctioning caused by sudden hit.

Emergency valves can be provided for these hydraulic pipes, so that one pipe's leakage won't influence others.

In the cabin, handrails can be added to prevent passengers from being sucked out.

The integrity of IRS should be checked, and the way the IRS and other systems are connected should also be considered. The IRS failure indication and insufficient precision indication should be independent and individual.

Besides, A jet engine is better than a turboprop engine.

4.2 To the Procedures

The checklist of IRS FAULT is recommended to adjust to:

IRS FAULT (IRS Failure)
Status: One or more situations below: ● **IRS FAULT** light was illuminated, or ● The position input to the FMC is incorrect, causing **ALIGN** illuminated at the same time.
1 Consider one of them: ◆ On the **ground**: Go to step 2. ◆ In the **air**: Go to step 6
… On the ground …
2 Consider one of them: ◆ ALIGN **extinguished**: Call for maintenance. ■■■■ ◆ ALIGN also **illuminated**: IRS Mode selector … OFF … FAULT will extinguish and ALIGN will extinguish within 30 seconds. Go to step 3.
3 **After** ALIGN extinguished: IRS Mode selector … NAV Input current position.
4 Consider one of them: ◆ ALIGN **flashing**: Input current position again. Go to step 5. ◆ ALIGN **not** flashing: Go to step 5.
5 Consider one of them: ◆ FAULT **illuminates** again: Call for maintenance. ■■■■ ◆ FAULT **no longer** illuminates: ■■■■
… In the air …
6 IRS ATT and/or NAV may be inoperative. In ATT mode, IRS may provide limited information, which only contains attitude, heading and some essential data.
7 Consider one of them:

	◆ Leprechauns are working in this area: (Aircraft under update[55]) or IRS overhead panel shows the inoperative IRS display is **the same** as the operative ones for required parts: Go to step 12. ◆ Leprechauns are **not** working in this area: Wait for 15 seconds and go to step 8.	
8	Consider one of them: ◆ FAULT still **illuminates**: Go to step 9. ◆ FAULT **no longer** illuminates: [redacted]	
9	Consider one of them: ◆ ATT is necessary for the inoperative IRS: Go to step 10. ◆ ATT is **not** necessary for the inoperative IRS: Go to step 12.	
10	Consider one of them: ◆ The main attitude display of the captain or the first officer is **inoperative**: IRS mode selector (**The inoperative side**) This action is not revokable! Keep the wing level and fly straight until the attitude display appears, which takes approximately 30 seconds. ◆ The main attitude display of the captain or the first officer is **working**: Go to step 13.	… ATT
11	Consider one of them: ◆ FAULT **extinguishes**: Input original heading in POS INIT page of FMS or overhead panel. Update heading value from time to time. **Never** engage autopilot. [redacted] ◆ FAULT **still** illuminates: Go to step 12.	
12	IRS transfer switch **Never** engage autopilot.	… BOTH ON L Or BOTH ON R (As required)
13	Consider one of them:	

[55] Means the change towards IRS.

	◆ Leprechauns are working in this area: **Checklist completes except delayed items**. ■■■■ ◆ Leprechauns are **not** working in this area: ■■■■
	Delayed items
1	Execute this checklist when the work of leprechauns is completed.
2	Consider one of them: ◆ FAULT **illuminates** again: Restart the IRS FAULT checklist. ■■■■ ◆ FAULT **no longer** illuminates: Repeal all restrictions to the use of autopilot. ■■■■

(Major changes are item 6,7,8, and newly added delayed items)

Also, it is recommended to add a table in QRH indicating the performance of the aircraft without certain parts of fuselage and add a "Fuselage Broken" checklist like:

	Fuselage Broken	
	Status: One or more **in-flight** situations below: ● Master Caution triggered indicating damaged fuselage, or ● A damage to fuselage has been confirmed.	
1	Avoid steep turn, climb, or descent. Decelerate if **faster** than 250 kts.	
2	Consider one of them: ◆ Compression is **normal**: Go to step 9. ◆ Compression is **abnormal**: Go to step 3.	
… Abnormal Compression …		
3	Wear oxygen mask. Crew oxygen	 … 100%, Checked
4	Establish crew communication.	
5	Passenger sign	… ON
6	Passenger oxygen Ensure that passengers can breathe.	… ON
7	Bleed mode Bleed valve (In order to prevent large pressure difference)	… MAN … OPEN
8	Start **emergency descend procedure (Page 0.1)**. Ensure that the speed is slower than 250 knots.[56]	

[56] Depends on the type of the aircraft. So are following values.

	Then continue this checklist.	
… Normal Compression …		
9	Consider one of them: ◆ **Confirm** equipment area damage: Execute related checklist. Consider related components inoperative. Then continue this checklist. **Do not** use fuel jettison for engine areas. Go to step 10. ◆ **Unsure** if equipment area damage or confirm equipment area **undamaged**: Go to step 10.	
10	Consider one of them: ◆ **Confirm** wing area damage: Ensure that the speed is faster than 190 knots. **Do not** extend flaps beyond 5 if any parts of flap are damaged. Go to step 11. ◆ **Unsure** if wing area damage or confirm wing area **undamaged**: Go to step 11.	
11	Land as soon as possible.	
12	**Checklist completes except delayed items.** ■■■■	
Delayed items		
… Descend …		
1	Compression **(If the compression was abnormal)**	**… MAN OPEN** **… 0**
2	RECALL	… Checked
3	Consider one of them: ◆ **Confirm** wing area damage or **unsure** if wing area damage: Autobrake Go to step 4. ◆ Confirm wing area **undamaged**: Autobrake Go to step 4.	 **… MAX** **… ____**
4	Landing data	… VREF __, Minimum ___
5	Approach briefing ■■■■	… Completed
… Landing …		
1	Engine starter	… CONT

2	Consider one of them: ◆ **Confirm** wing area damage or **unsure** if wing area damage: Go to step 3. ◆ Confirm wing area **undamaged**: Speed brake Go to step 3.	 **… ARMED**
3	Gear	… DOWN
4	Consider one of them: ◆ **Confirm flap** area damage: Flaps Finish overspeed landing checklists. [redacted] ◆ **Confirm other wing** area damage: Flaps Ensure that the speed is **faster** than 190 knots. [redacted] ◆ **Unsure** about wing area damage: Flaps Ensure that the speed is **faster** than 160 knots. [redacted] ◆ Confirm wing area **undamaged**: Flaps [redacted]	 **… 5, _____** **… ___, Green** **… 30, Green** **… 40, Green**

The way the dispatch works should also be adjusted. A system should be established to evaluate the risk and the experienced should have higher priority to take part in dangerous missions. The commanders and dispatches should never select unskillful pilots to carry out these kinds of risky missions. The erode of leprechauns should also be considered when a plan is being revised.

4.3 To Leprechauns

Officials may find leprechauns' ancestors without telling them and prevent them from encountering their ancestors' body or other related things. They can also consider how to enhance leprechauns by using their ancestor's energy. This is recommended to be done confidentially.

While leprechauns are recommended to learn from Chtholly, leprechauns might also need to learn to save themselves' lives. However, whether it's more beneficial to save more leprechauns' lives, remains to be seen.

Chemical analysis suggests that the leprechauns can be boosted by NO_2^-, as this is the true reason why they can fight, but its negative effects are unknown. The detection using Ag^+ to evaluate their ability is outdated and should be stopped, therefore, but the function of examining

their health is approved. Instead, use reducer to detect is a better idea.

A simple evaluation table is also given, which can be used to check the ability to fight during a battle. To use this table, initially confirm the concentration of HNO_2, then look for the NO_2^- axis for the expected result. Entering red areas (which may differ among leprechauns) should be avoided.

The way in which leprechauns fight can also be improved as Willem recommended.

4.4 To Commanders and Dispatches

4.4.1 General Advice

A new forecast system which can predict monsters' appearance for commanders and dispatches is urgently needed. This can help them make decisions more correctly.

The emergency and rescue procedure are proved correct, and they should continue being used, with some minor adjustments. For example, after a short battle, if time permits, the number of soldiers should be dynamically checked to ensure that no one is left or missing.

4.4.2 Detailed Implementation of the Warning System

Current equipment has already supported the warning when Timeres were on the ground. It has also been confirmed that Timeres will invade a floating island and then divide into 2 same individuals on it and continue flying up from the two sides.

There have also been floating islands that have been descended too much to live in, and a maximum acceptable altitude Timeres can reach can be confirmed in this way. Therefore, here is a quicker way to predict their positions through segment trees. With the number of empty island m and initial Timeres n, as well as the position and size of islands and the initial positions given, following program shows a way to solve this program (Notice that in this example, the final result is taken modulo 998244353):

```
#include <iostream>
#include <vector>
#include <set>
#include <map>
#include <algorithm>
using namespace std;

/*

This code is written based on the requirement of the Section 4.4 (Recommendations: To Commanders and Dispatches)
of The Second Edition of Final Report of 3W-CHT Airbus A400's Accident.
```

```
    (aka The Chtholly's accident)

The original text is given below:
    | A new forecast system which can predict monsters' appearance for commanders and
dispatches is urgently needed.
    | This can help them make decisions more correctly.

*/

inline void train() {
        ios::sync_with_stdio(false);
        cin.tie(0);
        cout.tie(0);
}

const long long MODER = 998244353;
const int N = 4e5+12;
const int RS = 1e5 + 3;

long long val[N], lazy[N];
int cnt[RS];

#define maxi(a,b) ((a) > (b) ? (a) : (b))
#define mini(a,b) ((a) < (b) ? (a) : (b))

void build(int l, int r, int root) {
    if (l > r) return;
    lazy[root] = -1;          // No lazy tag
    if (l == r) {
        val[root] = cnt[l];
    } else {
        int mid = (l+r) >> 1;
        build(l, mid, root<<1);
        build(mid+1, r, (root<<1)|1);
        val[root] = (val[root << 1] + val[(root << 1) | 1]) % MODER;
    }
}

void passdown(int at, int l, int r) {
    if (lazy[at] < 0) return;
    int mid = (l + r) >> 1;
    val[at<<1] = (lazy[at] * (mid-l+1)) % MODER;
    val[(at<<1)|1] = (lazy[at] * (r-mid)) % MODER;
```

```
    lazy[at << 1] = lazy[at];
    lazy[(at << 1) | 1] = lazy[at];
    lazy[at] = -1;
}

long long query(int l, int r, int root, int ql, int qr) {
    if (l > r || ql > qr) return 0;
    if (ql <= l && qr >= r) {
        return val[root];
    }
    passdown(root, l, r);
    int mid = (l+r) >> 1;
    long long lval = query(l, mid, root<<1, maxi(l, ql), mini(mid, qr));
    long long rval = query(mid+1, r, (root<<1)|1, maxi(mid+1, ql), mini(r, qr));
    return (lval + rval) % MODER;
}

void update(int l, int r, int root, int ql, int qr, long long req) {
    if (l > r || ql > qr) return;
    if (ql <= l && qr >= r) {
        val[root] = (req * (r - l + 1)) % MODER;
        lazy[root] = req;
        return;
    }
    passdown(root, l, r);
    int mid = (l+r) >> 1;
    update(l, mid, root<<1, maxi(l, ql), mini(mid, qr), req);
    update(mid+1, r, (root<<1)|1, maxi(mid+1, ql), mini(r, qr), req);
    val[root] = (val[root << 1] + val[(root << 1) | 1]) % MODER;
}

struct seg {
    int start, end;
    seg() {

    }
    seg(int start, int end) : start(start), end(end) {

    }
};

bool cmp(const seg &a, const seg &b) {
    return a.start < b.start;
```

```
}

map<int, vector<seg> > islands;

int n,m;
constexpr int L = 0, R = 1e5, C = 1;

int main() {

    train();

    cin>>n>>m;
    for (int i = 0; i < m; i++) {
        int a,b,c;
        cin>>a>>b>>c;
        islands[-c].push_back(seg(a,b));
    }
    for (int i = 0; i < n; i++) {
        int x;
        cin>>x;
        cnt[x]++;
    }
    build(L, R, C);
    for (auto &i : islands) {
        sort(i.second.begin(), i.second.end(), cmp);
        for (auto &j : i.second) {
            long long carea = query(L, R, C, j.start, j.end);
            if (j.start == j.end) {
                update(L, R, C, j.start, j.start, (carea << 1) % MODER);
            }
            else {
                update(L, R, C, j.start, j.start, carea);
                update(L, R, C, j.end, j.end, carea);
            }
            update(L, R, C, j.start + 1, j.end - 1, 0);
        }
    }
    cout<<query(L, R, C, L, R) % MODER<<endl;   // Should mean: val[C].
    return 0;
}
```

4.5 Following Research

Although the investigation is done, there are still some problems unsolved:

- The detailed aerodynamic performance when certain parts of fuselage are lost,
- The detailed reason why certain ions work for leprechauns, and
- The detailed factors of the connection of leprechauns, as well as its related influences.

AFTERWORD

The battle of Chtholly region is heartbreaking. While powder of the battle fading away from our sight, it still has something for us to learn from to be more well-prepared for next challenge. It is for this reason that this investigation team was set and worked hard for several months to present this final report.

From this investigation, we have discovered where the problems exist, and we're looking forward to related improvements to save more people's lives. We hope that everyone can come back and enjoy butter cakes in warmth, maybe in a rainy day[57].

Chtholly Seniorious was focused on in the investigation, since she sacrificed herself, while she could have her own happiness, to fight against Timeres and indirectly saved hundreds of, or even thousands of lives. She colored happiness and courage with blue covered by red in her memory. Her death was heroic, and although her physical existence has ended, her spirit lasts long. Next time when you see "*3W-CHT influenced by the service bulletin*", that will be the evidence of her existence.

The investigation team

The way, if it's all predetermined,
And the way I should go all my life.
I swear to go whatever will be.
'Cause there'll be something to see and to find.
I don't know the meaning of life,
But I know what's truly precious
The way, it leads me to be in love,
No fear, I can find me always in my heart.
The life, it's not for comparing things
So I hold both of light and shadow.
The rays of stars will bring me to you
Through the dark nights, I see the way to be shined.
I don't know what's right for our lives,
But I know the truth of my love.
The way, if it's all predetermined,
And the way I should go all my life,
I swear to go whatever will be.
Those memories I wouldn't have will always in my heart.
Those memories I wouldn't have will always in my heart.

-- *Always in my heart*

[57] This is a leprechauns' tradition to congratulate those who safely come back from a battle.

APPENDIX 1

Detailed pH Result After Balanced

In this table, the X axis is the concentration of HNO_2 and the Y axis is the concentration of NO_2^-.

	0.1	0.01	0.001	0.0001	1.00E-05	1.00E-06
90	6.205957	7.205957	8.205953	9.205914	10.20552	11.19992
80	6.152	7.151999	8.151995	9.151949	10.1515	11.14997
70	6.095191	7.095191	8.095187	9.095143	10.0947	11.0925
60	6.026294	7.026294	8.026289	9.026239	10.02574	11.0249
50	5.949639	6.949639	7.949635	8.94959	9.949148	10.94303
40	5.847492	6.847519	7.847512	8.847417	9.846441	10.84859
30	5.726832	6.728782	7.728778	8.728739	9.728346	10.72444
20	5.552717	6.550917	7.549355	8.551866	9.552281	10.54837
10	5.250589	6.250589	7.250584	8.250543	9.250128	10.24597
9	5.20598	6.20598	7.205976	8.205936	9.205543	10.20162
8	5.15196	6.15196	7.151956	8.15191	9.151455	10.14685
7	5.095102	6.095103	7.095098	8.095054	9.094612	10.09014
6	5.02539	6.025405	7.025402	8.025349	9.024822	10.01938
5	4.944025	5.944173	6.944181	7.944111	8.943389	9.946366
4	4.853382	5.853829	6.853071	7.853031	8.852631	9.848643
3	4.726354	5.728348	6.728345	7.728812	8.728419	9.724511
2	4.552699	5.552672	6.552822	7.552783	8.551307	9.548482
1	4.250744	5.25073	6.250724	7.250682	8.250266	9.246091
0.9	4.206233	5.206208	6.206201	7.206162	8.205767	9.201837
0.8	4.151421	5.151484	6.151485	7.151439	8.150965	9.146163
0.7	4.093417	5.093661	6.09368	7.093633	8.093138	9.088058
0.6	4.027942	5.028551	6.0286	7.028554	8.028042	9.022417
0.5	3.949604	4.951035	5.948419	6.94971	7.947937	8.946824
0.4	3.853783	4.853645	5.853627	6.853585	7.853185	8.849197
0.3	3.729808	4.729675	5.729585	6.729541	7.729076	8.72524
0.2	3.551354	4.553975	5.551834	6.553872	7.553479	8.54957
0.1	3.252688	4.251915	5.251818	6.251765	7.251323	8.246887
0.09	3.209974	4.208386	5.208191	6.208131	7.207719	8.203607
0.08	3.155017	4.156866	5.156829	6.156779	7.156331	8.151703
0.07	3.101274	4.098919	5.100276	6.099142	7.0998	8.095932
0.06	3.04039	4.033282	5.029332	6.033779	7.032276	8.028666
0.05	2.964619	3.955735	4.954499	5.953183	6.947607	7.948401
0.04	2.872642	3.859514	4.859278	5.859408	6.85245	7.854706
0.03	2.760485	3.739393	4.737066	5.729626	6.736376	7.732466
0.02	2.613298	3.570376	4.561776	5.564709	6.563805	7.5604
0.01	2.411241	3.294687	4.273623	5.270928	6.269187	7.268663
0.009	2.386699	3.25093	4.234367	5.232122	6.22737	7.223731

0.008	2.362026	3.214143	4.18618	5.182543	6.181889	7.178126
0.007	2.334719	3.167316	4.134349	5.130131	6.129373	7.125511
0.006	2.308478	3.116494	4.07295	5.062954	6.062225	7.058959
0.005	2.280952	3.058983	4.003278	5	5.996396	6.992494
0.004	2.255422	2.994869	3.921954	4.911596	5.91023	6.902187
0.003	2.227927	2.926859	3.820836	4.804811	5.802934	6.798859
0.002	2.199695	2.850539	3.69289	4.663606	5.659354	6.654995
0.001	2.170993	2.766407	3.51995	4.45132	5.445219	6.44489
0.0009	2.168115	2.757451	3.500527	4.426101	5.415849	6.408282
0.0008	2.164687	2.748199	3.479916	4.394126	5.386157	6.379542
0.0007	2.162322	2.738408	3.454384	4.366416	5.350362	6.347172
0.0006	2.159399	2.72761	3.435113	4.333144	5.316161	6.311768
0.0005	2.155676	2.722236	3.411798	4.294545	5.278247	6.272126
0.0004	2.153684	2.712868	3.387737	4.255984	5.236108	6.227837
0.0003	2.149566	2.702506	3.360756	4.215538	5.187265	6.181815
0.0002	2.147868	2.695245	3.337763	4.16915	5.136124	6.12673
0.0001	2.144631	2.685346	3.310827	4.118345	5.076162	6.067565
9.00E-05	2.144665	2.68422	3.308649	4.113068	5.069808	6.060156
8.00E-05	2.14443	2.683044	3.304187	4.107715	5.063316	6.053825
7.00E-05	2.14396	2.68181	3.30357	4.102289	5.056696	6.047245
6.00E-05	2.140499	2.680504	3.300299	4.096792	5.049356	6.040444
5.00E-05	2.143368	2.679112	3.298154	4.091225	5.042841	6.033456
4.00E-05	2.143277	2.677617	3.295018	4.08559	5.03605	6.026079
3.00E-05	2.142987	2.679863	3.292813	4.078898	5.029038	6.019006
2.00E-05	2.140017	2.678932	3.28974	4.073471	5.021715	6.011537
1.00E-05	2.142271	2.677991	3.287396	4.067895	5.014543	6.004085
9.00E-06	2.141963	2.677896	3.286523	4.06733	5.013809	6.003342
8.00E-06	2.141339	2.677801	3.2865	4.066763	5.012869	6.002588
7.00E-06	2.140166	2.677706	3.286232	4.066195	5.012183	6.00178
6.00E-06	2.142283	2.677611	3.28628	4.065626	5.011485	6.001056
5.00E-06	2.14216	2.677515	3.286066	4.065055	5.010777	6.00028
4.00E-06	2.141883	2.67742	3.285706	4.064483	5.01006	5.999475
3.00E-06	2.141265	2.677324	3.285161	4.063909	5.009334	5.998762
2.00E-06	2.139955	2.677228	3.284893	4.063335	5.0086	5.997972
1.00E-06	2.142124	2.677132	3.285032	4.062758	5.007861	N/A[58]

[58] The value in this block can't be correctly confirmed, because the concentration is really small.

In memory of

The 1 dead (Chtholly Nota Seniorious, 422 - 438)

and the 2 lost