



RE-OPENED ACCIDENT INVESTIGATION REPORT OF LION AIR FLIGHT LN602, EW 46465

Civil Aviation Authority of Sri Lanka

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1. SYNOPSIS

Terrorist Investigation Division (TID) of Sri Lanka Police requested Civil Aviation Authority of Sri Lanka (CAASL) to be a stakeholder of the investigation into the act of unlawful conduct on Lion Air flight LN 602 of 29th September 1998. Simultaneously, CAASL reopened the investigation into the above mentioned accident as per Section 63 of Civil Aviation Act 14 of 2010 “..... *where certain new evidence pertaining to the accident has been discoveredthe Authority shall order for such investigation to be reopened.*”

Accordingly this Authority appointed an Accident Investigation Team to assist the TID in identifying aircraft parts salvaged from the wreckage in the sea bed. The CAASL team participated in the following missions that was conducted by the TID.

The Wreckage recovery was planned for 14th November 2012, but due to bad weather it was postponed to February 2013. Subsequently exhumation of bodies of the ill- fated Lion Air flight commenced from 8th - 12th December 2012 at Puneryn. However no human remains were found after the excavation process.

The salvaging of the wreckage commenced from 2nd May – 5th May 2013. Debris supposed to have been under the sea bed since 1998 was salvaged by Sri Lanka Navy headed by Capt. Jayantha Gamage. Identification of parts of an aircraft, which was found with the debris was conducted by the CAASL team and a list of items was handed over to TID.

2. FACTUAL INFORMATION

Furthermore, it is noteworthy to mention following information as per the Interim Report submitted by Department of Civil Aviation on 28th Feb 1999 with respect to this accident.

- I. The flight had four Tech crew, three Cabin crew and forty eight passengers. Among them three bodies had been located by Sri Lanka Navy in 1998.

II. LTTE transmissions monitored by Sri Lanka Navy on 02nd October 1998 has picked up communication between two LTTE Stations “ 19 bodies washed ashore with debris of an aircraft at Devils Point, Nachchikudah, Vellankulam and Vedithalthivu areas”.

III. A decomposed body (skeleton) of a male wearing a life jacket was found on the beach on 29th December 1998 at Mannar.

IV. Two life jackets were recovered by Navy in Iranative Island and by a fisherman close to Jaffna town respectively.

V. The life jackets had the following serial numbers;

- Recovered by Navy S/N Y – 88121384
- Recovered by fisherman S/N Y – 88121371
- Recovered from the decomposed body S/N Y – 88121395

(It has been confirmed by the Gomelavia, the owner of the aircraft that the above life jackets of the above serial numbers belong to their Company and was put on board the aircraft EW 46465 on 16th may 1998 before leasing it to Lionair Ltd.)

VI. According to a written statement forwarded by Sri Lanka Air Force, a Parish Priest from Vankalai, Vavuniya who had gone to the sea costal area of Valappadu near Iranative Island (Uncleared area) had found a National Identify Card on the beach bearing No. 570491156V and name Kumaraswani Ragunathan who was a passenger of the Lionair flight. However, the identity card had been taken over by the LTTE.

Aircraft accident investigation was initiated based on previously published interim report.

Accordingly following are the details;

2.1. Crew information

Pilot in Command

Name	- Capt. Matoshka Asnatoli V
Age	- 45 years
Nationality	- Belorussian
License No	- III P No. 0000414
Validity of License	- till 29th April 1999
Last medical check	- 29th April 1998
Total flying hours	- 10835 hrs.
On type (AN-24)	- 10635hrs (5030 hrs. as Captain)

Co-pilot

Name	- Lisoivanov Siarhei G
Age	- 47 years
Nationality	- Belorussian
License No	- III P No. 0000429
Validity of License	- till 28th May 1999
Last medical check	- 28th May 1998
Total flying hours	- 7990 hrs.
On type (AN-24)	- 1750 hrs.

Navigator

Name	- Kozlov Sergei P.
Age	- 32 years
Nationality	- Belorussian
License No	- SH No 0000170

Validity of License - till 29th June 1999
Last medical check - 29th June 1998
Total flying hours - 1340 hrs.
On type (AN-24) - 220 hrs.

Flight Engineer

Name - Anapryienka Siarhei
Age - 36 years
Nationality - Belorussian
License No - BM No 0000105
Validity of License - till 01st July 1999
Last medical check - 1st July 1998

Cabin Crew

Name - Ms. Dharshani Gunasekera
Age - 20 years
Nationality - Sri Lankan

Name - Mr. Chrishan Nelson
Age - 20 years
Nationality - Sri Lankan

Name - Mr. K. Vijitha
Age - 34 years
Nationality - Sri Lankan

2.2. Aircraft Information

As stated in the interim Report the details supplied by Operator and Lessor on the subjective aircraft are as follows;

Aircraft Type	- AN-24RV
Serial No	- 27307901
Date of Manufacture	- 28.06.1972
Manufacturer	- Kiev Aviation Production Association
Registration & Nationality	- EW 46465 (Belorussian)
Certificate of Airworthiness	- valid till 21.01.2001
Owner	- Gomel Airlines, Belorussia
Operator	- Lionair (Pvt) Limited, Colombo Airport, Ratmalana, on wet lease (Lessee)
Lessor	- AAR Airlines, Keiv, Ukrain
Hours flown since new	- 42442 hrs
No. of Overhauls	- 8
Date of last Overhaul	- 21. 01. 98 (Overhauled at Factory No. 410, Kiev)
Hours flown since last overhaul	-399 hrs
Last Periodic Schedule Maintenance	-F-1 after 300 hrs done on 24.08.1998
Last line Maintenance	-F-BD before flight on 29. 09.1998

Power Plant (Engines)

Left Engine

Serial No	- H 47722019
Date of Manufactured	- 17. 05. 1977
Time since new	- 12121 hrs.
Date of last Overhaul	- 06.11.1997
Time since last overhaul	- 391 hrs.

Date of Installation - 15.04.1998

Right Engine

Serial No. - H 4242071

Date of Manufactured - 18.12.1972

Time since new - 17971 hrs.

Date of last overhaul - 08. 09. 1992

Time since last overhaul - 1002 hrs.

Date of Installation - 05. 01. 1998

2.3. Meteorological Information

There had been heavy rain in the morning at Palaly around 1000 hrs. Around 1340 hrs sky was overcast (cloudy condition) with surface winds 3000 – 2500/5-10 Knots.

2.4. Flight Data Recorders

The aircraft was equipped with the following recorders.

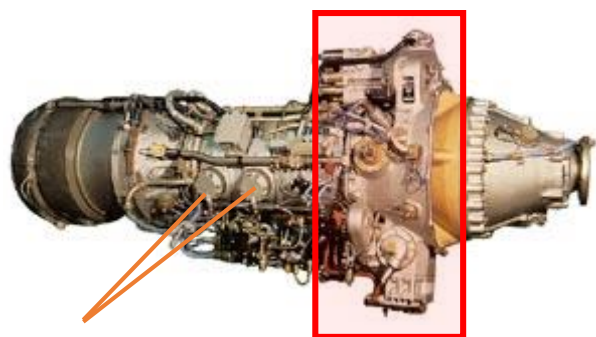
- a) Flight Data Recorder
- b) Cockpit Voice Recorder
- c) Auxiliary Data Recorder

3. TECHNICAL ASSESSMENT ON RECOVERED AIRCRAFT COMPONENTS

Engine: The wreckage of the engine recovered was badly damaged. Part/ serial numbers were not visible. The accessory gear box area was not intact with the engine. The propeller shaft was available and connected to the hub. A comparison of the wreckage (Fig 1) with a picture of an actual engine (Fig 2) is made below. With the external appearance and the size it is considered as a fair match to an engine type 'AI 24', fitted to AN 24 aircraft.



Fig 1



Bleed valves

Missing part of the engine wreckage

Fig 2

Auxiliary Power Unit (APU):

APU is the power generating unit of an aircraft which generate electrical power, as an alternative power source in addition to the main power sources coupled to the engine. The APU that was found was a single piece. (Fig 3) After the cleaning process, several numbers were found in multiple locations in the APU housing (Fig 4). These numbers were communicated to Antonov Design Bureau, Ukraine, and State of Registry, Belarus but a response has not been received at the time of writing of the report. Fig 5 & 6 are extracts from AN 24 Technical Guidance Manual.



Fig 3



Fig 4

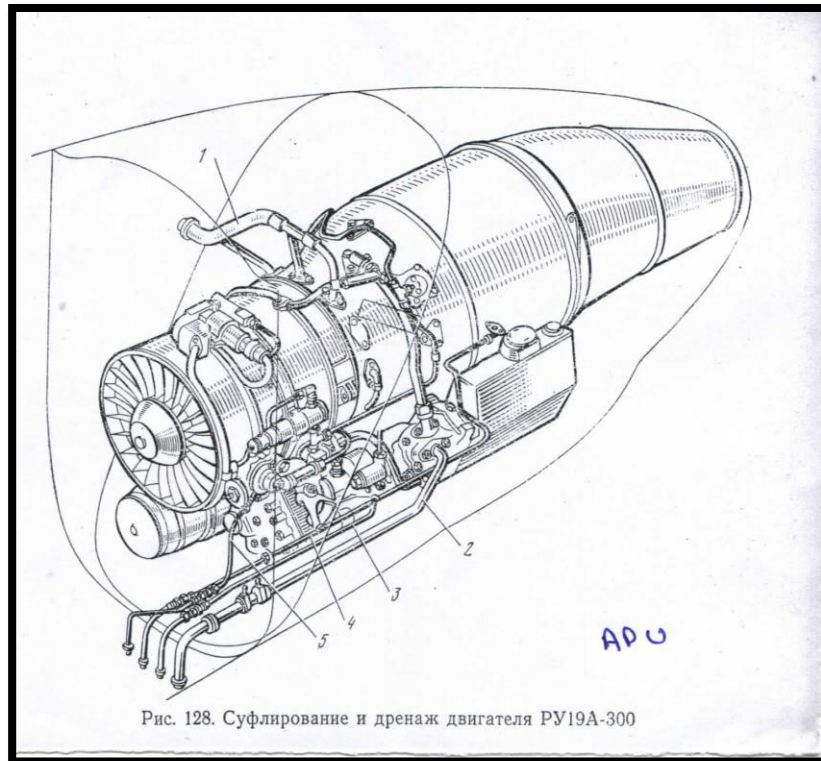


Fig 5

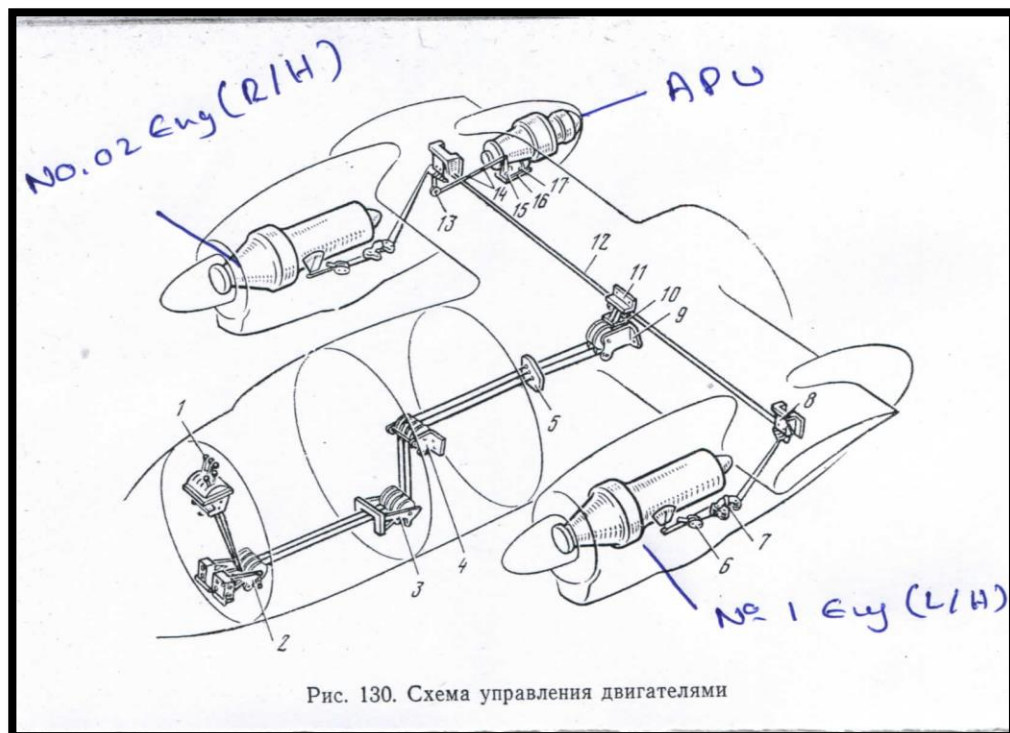


Fig 6

Main Landing gear (MLG):

The MLG which was recovered was found in highly deteriorated state without the wheel (Fig 7). The complete strut was intact from yoke to axel (Fig 8) and no other damages observed other than metal fraying due to prolong dunk in the sea water. Break units were attached to axels. No part/serial numbers were found even after subsequent cleaning enabling investigators to establish facts on the identity of debris.

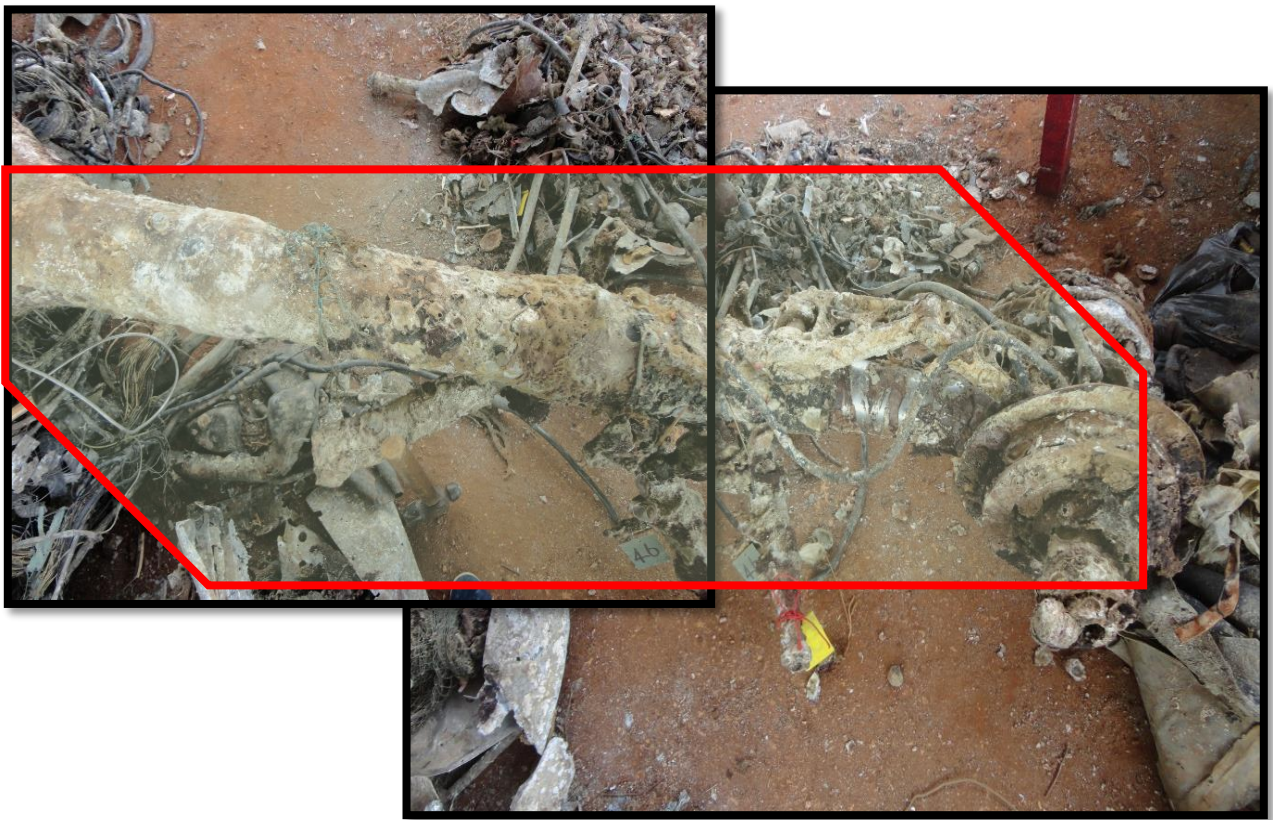


Fig 7

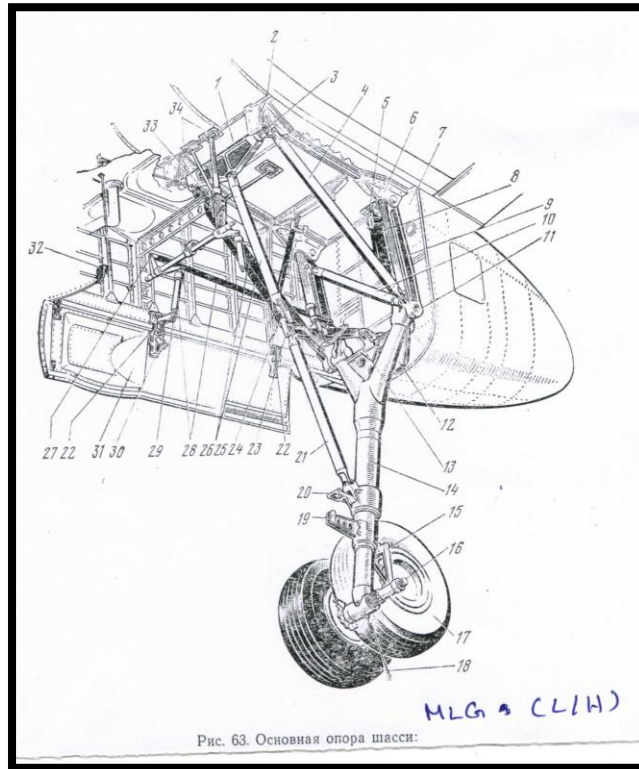


Fig 8

As there is only one APU available in an AN 24 aircraft and as it is located in the right wing engine compartment (fig 6), it is considered very rationale to assume that other parts recovered from close proximity of the site in the sea bed, the engine and the main landing gear recovered are of the same side of the aircraft which is right hand side (Starboard).

Further it is noteworthy to mention here that although a considerable portion of components suspected that of right side of the wing was found with the wreckage, no identifiable component of the left wing or portions of the left wing was found. This fact implies that the left wing components may have been disintegrated at a different time or at a different location.

Nose Landing Gear (NLG): The nose strut which was recovered was attached to a part of the airframe (Fig 9). The location is marked in the side elevation diagram of the Aircraft (Fig 15). There were no Part/ Serial numbers found.



Fig 9

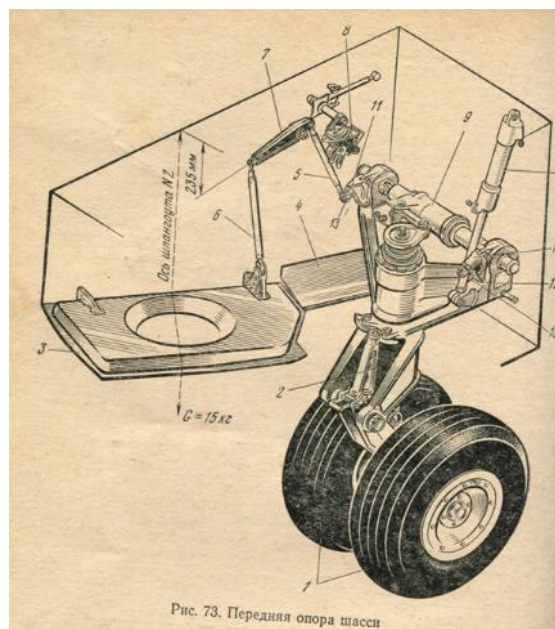
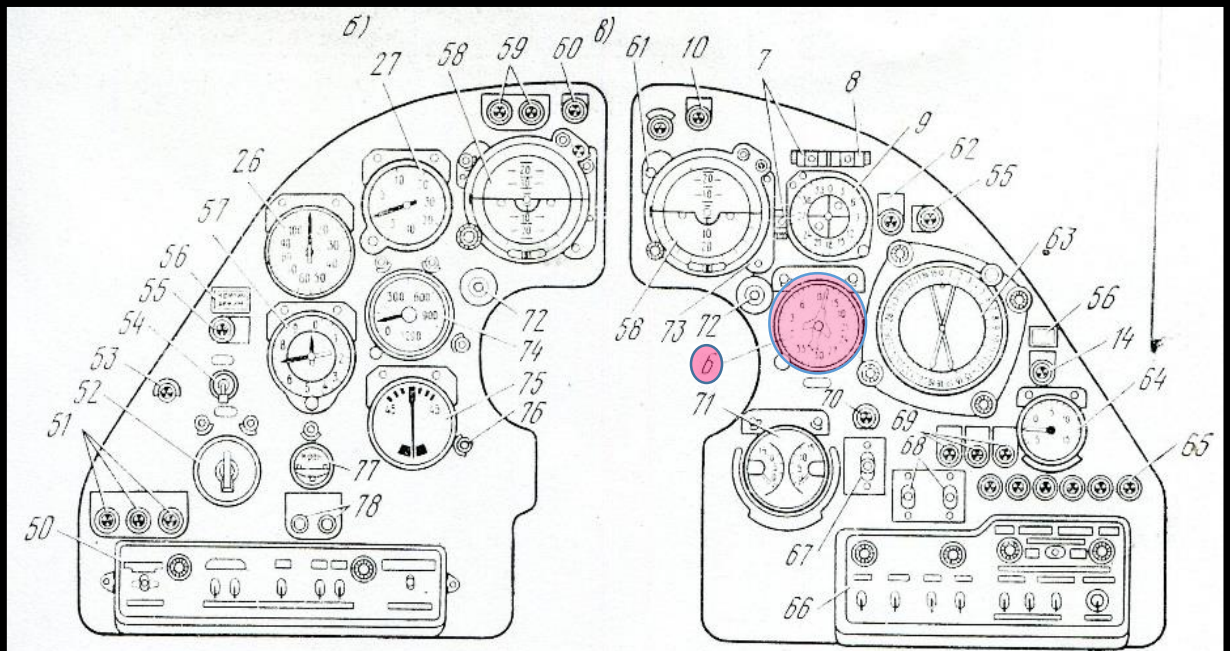


Fig 10



3, 4, 10, 12, 14, 24, 25, 38, 40, 41, 43, 44, 45, 49, 51, 55, 59, 60, 62, 65, 69 — сигнальная арматура «Работает ПРД-КВ» (14), «Отказ топливного фильтра» (24), сигнализация остатка топлива «Остаток масла» (43), «Пользуйся кислородом» (44), «Двери и люки открыты» (45), «Отказ «Внимание, локатор» (60), «Отказ обогрева ПРД» (62), сигнализация обогрева (65), сигнализация (из комплекта ТСА-15УМ); 6 — задатчик курса ЭК-2; 7 — светильник СВ-1; 8 — светильник УАП-14КР; 13 — потенциометры ПП-3 подсвета каналов РЛС; 15 — переключатель ПНГ-15К женого рычагов топлива УПРТ-2; 18 — указатели ИТГ-2 термометра; 19 — аварийный компасного индикатора; 22 — указатели критических

Wreckage of the emergency exit:

A part resembling an emergency exit of an AN 24 aircraft has been recovered. The painting found on this part is somewhat similar to external appearance of aircraft operated by Lion Air. (Fig 11 & 12). A placard containing the opening instructions of the emergency exit was found in the wreckage (Fig 13).

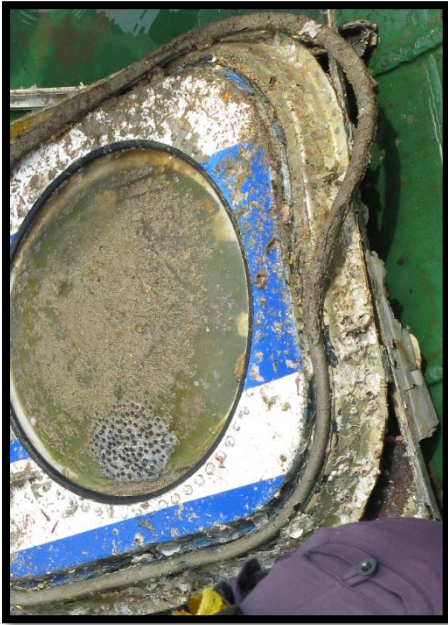


Fig 11

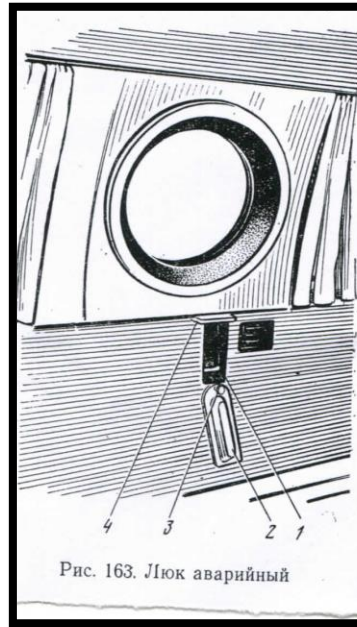


Fig 12

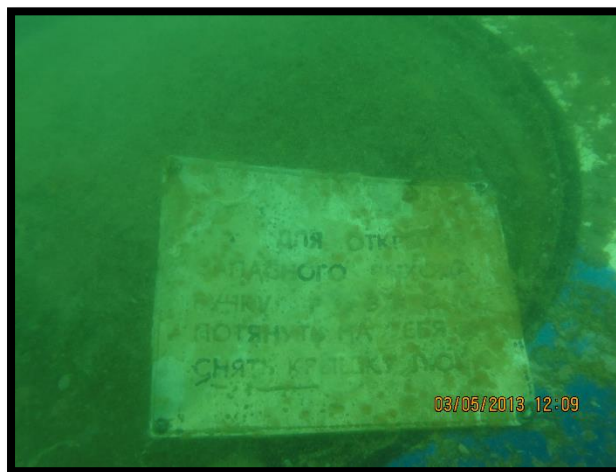


Fig 13

Control Column: Appearance and size matches to that of an AN-24 aircraft left side control column since the red button that is found in the part which was recovered is located on the left hand side of the control column. (Port) (Fig 14)

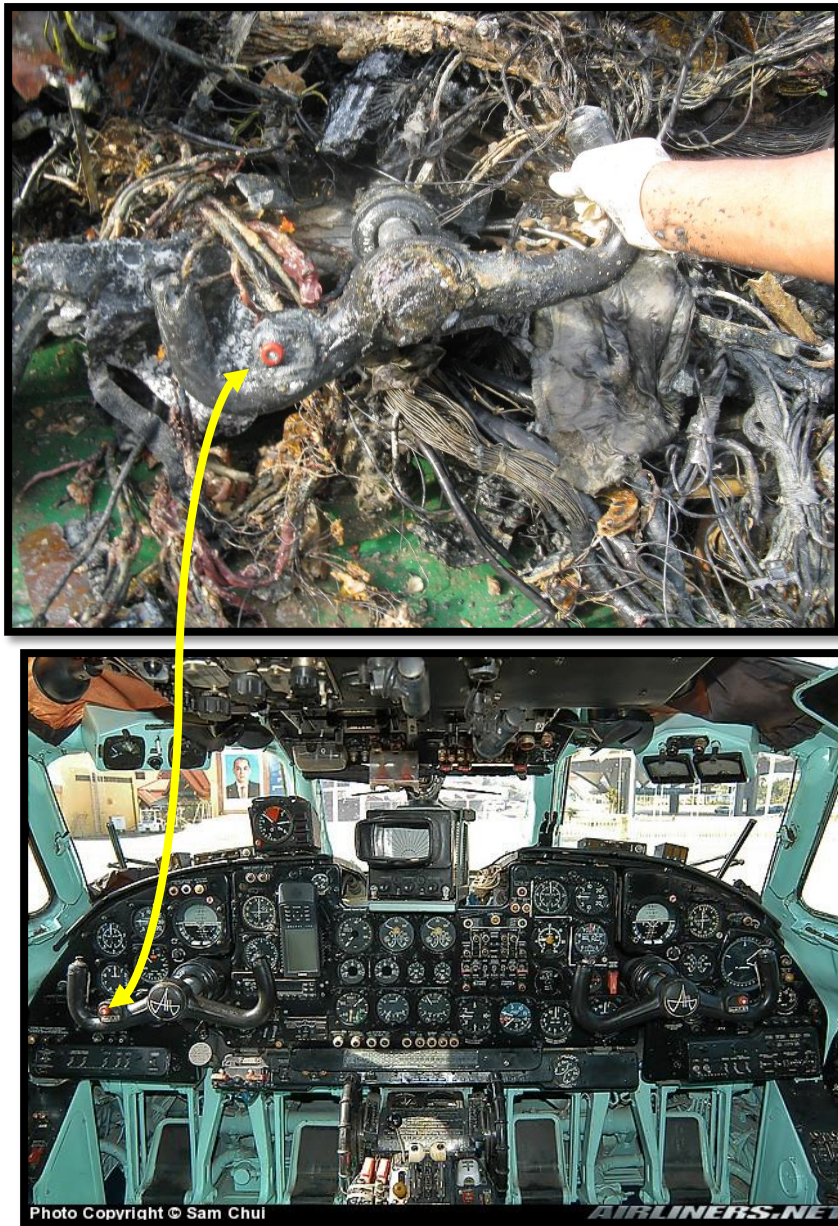
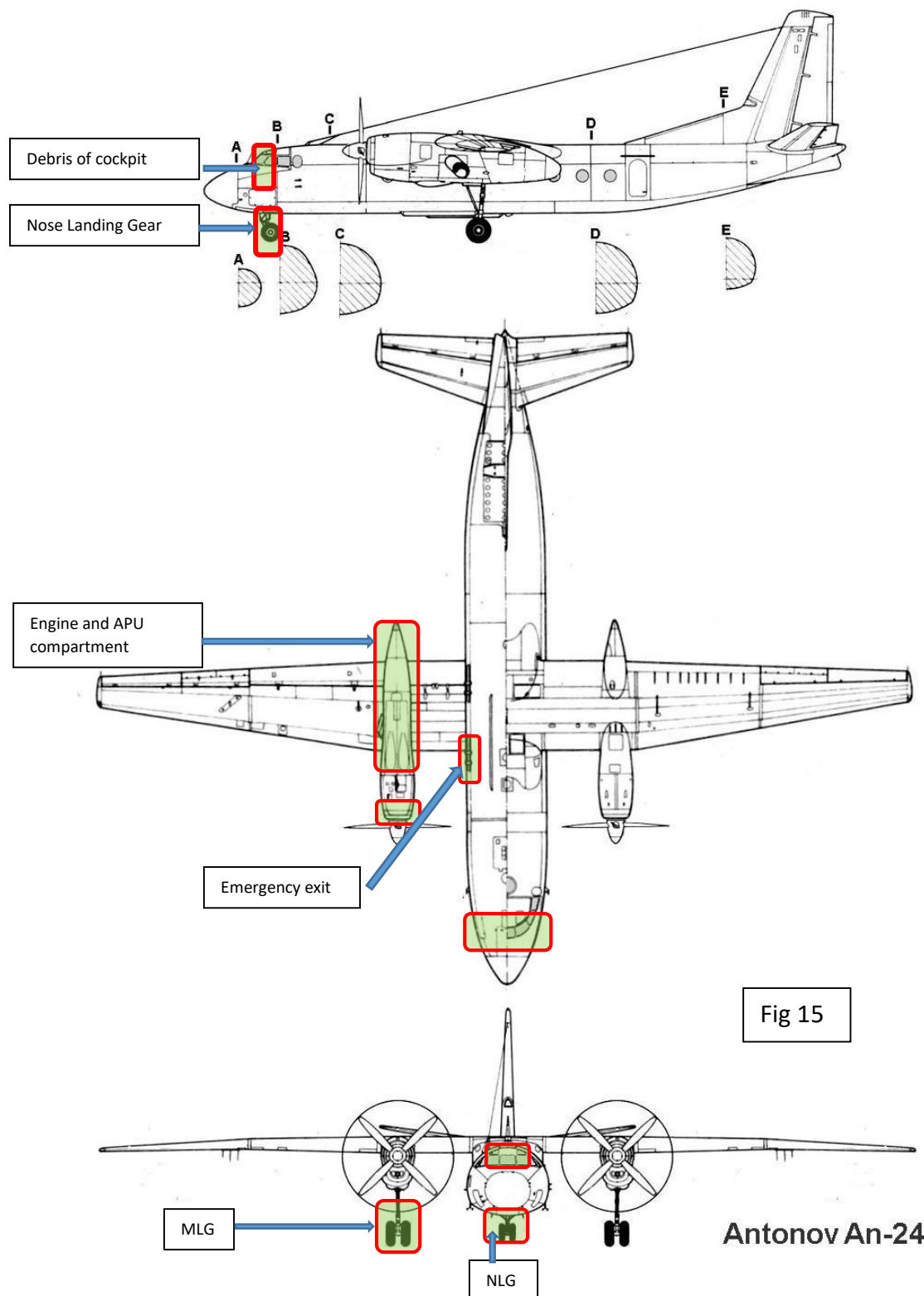


Fig 14

Source of the comparison picture: -

<http://cdn-www.airliners.net/aviation-photos/middle/9/2/9/0754929.jpg>
<http://cdn-www.airliners.net/aviation-photos/middle/9/2/9/0754929.jpg>

Locations of the suspected main parts recovered from the wreckage:



DATA Recorder: No evidence of debris was found to be that of CVR or FDR. But a highly corroded and damaged debris which has been confirmed by the manufacturer as the Auxiliary data recorder.



Fig 16

It is estimated that only about 30-40% of the wreckage has been found and out of which most of the pieces are beyond recognition due to sea weed & metal deterioration as they have been under water for almost 15 years.

4. CONCLUSION

Wreckage that was claimed from the sea bed has been lying there for the last 15 years according to the information received so far. Therefore analyzing wreckage to collect evidence to prove the cause of accident is somewhat remote due to the reasons given below.

- I. Layout of debris would have been disturbed due to various environmental conditions such as under water currents, impact of Tsunami during 2004, Human activities, fisherman & terrorists, so on so forth.
- II. It is difficult to obtain factual information on parts found in the wreckage due to obscured status due to corrosion & fraying of alloys lying in sea water.
- III. It is impossible to handle parts due to the corroded condition of the wreckage and it may further damage the parts. Although it is customary during an aircraft accident investigation to reconstruct the aircraft with the available parts, it cannot be done in this mission due to the limited parts identified.
- IV. There is lack of evidence, such as the cause of death of all the passengers and due to prolonged duration of years, it is difficult to obtain accurate eye witness to the accident either.
- V. There is a difficulty in finding out relevant literature of aircraft & equipment as the operator of the Airline in Belorussia, is non- existent. As the local operator Lion Air is not functional now and further the absence of records either with the airline personnel or at CAASL pertaining to this aircraft, gathering more information is also not possible.

5. RECOMMENDATIONS

- I. As the suspected cause of the accident is by a missile attack, it is recommended to source for expertise in handling missile attacks and/or explosions on aircraft engines & wings and hand over the task to such expertise.
- II. As informal evidence has been received through available relatives of deceased crew, with regard to a crew member who has been wearing a gold cap on tooth, a DNA test is required for the identification, through his mother to establish that he has been one of the crew members on that ill-fated aircraft.
- III. CAASL has to follow up the confirmation on aircraft parts by the State of Registry, which is yet to be completed.
- IV. It is further recommended that through DNA tests, passengers of the ill- fated aircraft may be identified from the varying human remains found in the debris.
- V. It is recommended to carry out a further survey in the sea bed and in & around the location at least 2-3 NM north of the track of the site to find further evidence to establish the rest of the parts.
- VI. Important major component of any aircraft is the empennage which secures the FDR and CVR (Black Box). They were not found during the salvage recovery.