FINAL REPORT

AN 12 AIRCRAFT ACCIDENT

ON 24.03.2000

AT NEGOMBO, SRI LANKA

SKYCABS (PRIVATE) LIMITED ANTONOV - AN12 T BK AIRCRAFT BEARING REGISTRATION NUMBER RA11302 ACCIDENT

AT KADIRANA, NEGOMBO, SRI LANKA ON 24.03.2000

FINAL REPORT

SYNOPSIS

The information of an AN 12 aircraft accident in the proximity of the Bandaranaike International Airport Colombo, Sri Lanka reached the Department of Civil Aviation, Sri Lanka in the late evening on Friday, 24th March 2000. Soon after, the senior officials of the Department visited the crash site.

As the State of Occurrence, Sri Lanka instituted an investigation into the circumstances of the accident. The Director General of Civil Aviation, by virtue of powers vested in him under the Air Navigation Regulations of Sri Lanka, as the Chief Inspector of Accidents authorized three Inspectors of Accidents on 25th March 2000, to hold an investigation into the causes and circumstances of the accident.

A notification of the accident was immediately forwarded to;

1. Air Transport Accident Investigation Commission, Russian Federation;
2. State Aviation Committee, Belarus;
3. Air Transport Department, Ukraine;
4. ICAO Asia Pacific Regional Office, Bangkok, Thailand; and
5. ICAO Headquarters, Montreal, Canada.

An informatory note of the accident was handed to the Hon. Minister of Tourism and Civil Aviation in the morning on 25th March 2000. All possible measures were taken to protect the evidence and to maintain safe custody of the aircraft and its contents until the investigation is completed. An update of the investigation was presented to the Secretary, Ministry of Tourism and Civil Aviation on 29th March 2000.

As the investigation progressed, the Director General of Civil Aviation authorized three more officers as Inspectors of Accidents increasing the number of Inspectors to seven, which included the following.

1. Mr. Lal Liyanaarachchi, Director General of Civil Aviation, DCA, Sri Lanka - Chief Inspector of Accidents
2. Mr. A W K Senaratne, Assistant Director - Aeronautical Inspection, DCA, Sri Lanka
3. Captain David Noaker, Senior Flight Operations Inspector - ICAO Safety Oversight Project, DCA, Sri Lanka
4. Mr. D M P Dissanayake, Personnel Licensing Officer - ICAO Safety Oversight Project, DCA, Sri Lanka
5. Wing Commander B L W Balasooriya, Commanding Officer, Advanced & Specialized Trade Training School - Sri Lanka Air Force
6. Flight Lieutenant P D Lathpandura - Sri Lanka Air Force
7. Captain W P A Jayasinghe, Flight Operations Inspector - ICAO Safety Oversight Project, DCA, Sri Lanka

In addition, the following five officers were called upon to assist the Investigation Team in their respective disciplines.

1. Mr. Senarath Liyanage,(Senior State Counsel)- Legal Consultant, DCA, Sri Lanka
2. Mr. H M C Nimalsiri - Assistant Director Operations, DCA, Sri Lanka

3. Mr. Amal Hewawasam - Senior Airworthiness Inspector, ICAO Safety Oversight Project, DCA, Sri Lanka
4. Mr. V J Premaratne - Aeronautical Inspector, DCA, Sri Lanka
5. Mr. K H Priyadarshan - Quality Assurance Inspector, SriLankan Airlines Limited

The following Team who represented the Interstate Aviation Committee of the Russian Federation was present in Sri Lanka briefly and helped the Accident Investigation Team with their expertise.

1. Mr. V V Cherniaev - Chief, Field Operation Division, Air Transport Accident Investigation Commission, Interstate Aviation Committee, Russia
2. Mr. U F Skripkin - Chief Specialist Section 'Investigation of Parametrical Information', Air Transport Accident Investigation Commission, Interstate Aviation Committee, Russia

Copies of the Preliminary Report were forwarded to the Director General, Air Transport Accident Investigation Commission, Russian Federation and ICAO Headquarters in Canada on 21st April 2000.

The Director General of Civil Aviation, Department of Civil Aviation, Sri Lanka, released the Final Report on 25th January 2002.

The Final Report reveals that the ill-fated AN 12 aircraft, a cargo flight from Bangkok International Airport, Thailand to Bandaranaike International Airport Colombo, Sri Lanka was unable to land in extreme weather conditions and crashed due to fuel exhaustion while attempting to land at the destination airport on the third approach following two previous unsuccessful attempts to land. The aircraft did not carry the required quantity of fuel to proceed to the planned alternate airport in the Republic of Maldives.

Unless stated otherwise, all times appear in this Report are Co-ordinated Universal Time (UTC). Sri Lanka local time is +6 hours UTC.

A Report compiled by the Inter State Aviation Committee of the Russian Federation mainly based on the technical analysis of onboard data recorders is attached as Appendix 1 in Section 5 of this Report.

Mr. A W K Senaratne and Captain David Noaker, two of the authorized Inspectors of Accidents, left the Department of Civil Aviation, Sri Lanka at the end of their respective contract periods prior to completion of the investigation and compilation of this official Final Report.

1. FACTUAL INFORMATION

1.1 History of the flight

1.1.1 The Sky Cabs flight SCB 701 originated in Colombo (Bandaranaike International Airport Colombo - hereinafter known as BIA Colombo), Sri Lanka at 1940 hours on 23rd March 2000. It landed in Bangkok, Thailand at

0120 hours on the following day after an uneventful flight. The alternate airport for Bangkok was Rayong/Ban U-Taphao (VTBU).

The crew had recent experience in operating AN 12 flights between BIA Colombo and Bangkok International Airport, Thailand.

1.1.2 The same flight crew made the return flight back to BIA Colombo after 4 hours and 20 minutes ground time in Bangkok. The crew had received the weather report from Aero Meteorological Division (AMD), prior to departure. An air traffic control flight plan was filed to BIA Colombo, the filed alternate airport was Male International (VRMM) in the Republic of Maldives. The aircraft was refueled adding 6681 kgs of fuel to the remaining 8300 kgs bringing the total fuel onboard to 14981 kg.

1.1.3 Flight SCB 702, cargo flight, departed Bangkok at 0540 hours on 24th March 2000 to BIA Colombo. The scheduled flight time for Bangkok – BIA Colombo was five hours and twenty minutes with a scheduled time of arrival of 1100 hours (17:00 hours Sri Lanka time).

1.1.4 SCB 702 made the first radio contact with Sri Lanka air traffic control at 1016 hours. The area controller passed SCB702 the latest weather report effective for BIA Colombo and later, a Sigmet valid at the time.

When the control of the flight was handed to the approach radar controller (Director) by the area controller, at 1042 hours SCB 702 was asked to report his radial and DME from Colombo, (i.e. from "DVOR/DME KAT"). SCB 702 reported as saying "074 radial and 55 DME ready for descent", thus the two-way communication was established. Later, the flight SCB 702 made two unsuccessful ILS approaches to runway 04**.** While on a radar heading to get established on the ILS to Runway 22 for a third attempt to land, the aircraft crashed 1.2 N.M. north-northwest of the threshold of Runway 22 (3.2 N.M. north-northeast of the DVOR/DME 'KAT') at BIA Colombo at 1204 hours (or 1804 hours in the evening, local time) on 24th March 2000.

1.2 Injuries to Persons

Injuries	Crew	Passengers	Others	Total
Fatal	6	Nil	3	9
Serious	2	Nil	3	5

Of the eight on board the aircraft, seven were Russian nationals and the other, a Sri Lankan national.

1.3 Damage to the Aircraft

Aircraft was destroyed beyond repair.

1.4 Other Damages

During the final stages of the flight prior to the crash, approximately twenty coconut trees had been cut at various levels. Three houses were completely destroyed and seven other houses were partly damaged. A van parked

outside a repair garage was severely damaged. Electric power supply lines in the vicinity of the crash site were substantially damaged.

1.5 Personnel Information

1.5.1 On board the aircraft:

According to the General Declaration of the flight, there were eight persons, on board the aircraft, as follows.

1.5.1.1 Captain:

Bokorev Alexander Urivech, age 41 years, Russian national.

Russian Airline Pilot Licence number IP No 007393, valid to 16/07/2000, AN-12 rated.

Total flight hours: 6719, including 961 on the AN-12.

Before the crash, the Captain was on duty for 34 hours and 09 minutes without a legal rest period. In this 34 hour and 09 minute period he flew 4 sectors, totaling 20-hours and 19 minutes flight time.

Flight hours during the last 30 days: 161 hours and 34 minutes.

1.5.1.2 Co-Pilot:

Penchev Victor Alexcevich, age 47 years, Russian national.

Russian Airline Pilot Licence number IP No 007396, valid to 25/01/2001, AN-12 rated.

Total flight hours: 10802, including 1702 on the AN-12.

Before the crash, the Co-Pilot was on duty for 34 hours and 09 minutes without a legal rest period. In this 34 hour and 09 minute period he flew 4 sectors, totaling 20-hours and 19 minutes flight time.

Flight hours during the last 30 days: 161 hours and 34 minutes.

1.5.1.3 Navigator:

Petrov Sergei Victorovich, age 40 years, Russian national.

Russian Navigator Licence number II SH No 002832, valid to 01/06/2000, AN-12 rated.

Total flight hours: 12360, including 4291 on the AN-12.

Before the crash, the Flight Navigator was on duty for 34 hours and 09 minutes without a legal rest period. In this 34 hour and 09 minute period he flew 4 sectors, totaling 20-hours and 19 minutes flight time.

Flight hours during the last 30 days: 161 hours and 34 minutes.

1.5.1.4 Flight Mechanic:

Sergei Alekceevich Sizikh, age 45 years, Russian national.

Russian Flight Mecanic Licence number III BM No 001270, valid to 07/06/2000, AN-12 rated.

Total flight hours: 6393

Before the crash, the Flight Mechanic was on duty for 34 hours and 09 minutes without a legal rest period. In this 34 hour and 09 minute period he flew 4 sectors, totaling 20-hours and 19 minutes flight time.

Flight hours during the last 30 days: 161 hours and 34 minutes.

1.5.1.5 Flight Radio Operator:

Mathishev Vadim Mihailovich, age 52 years, Russian national.

Russian Flight Radio Operator Licence number IV BR No 001541, valid to 19/11/2000, AN-12 rated.

Total flight hours: 7655 including 5840 on AN12.

Before the crash, the Flight Radio Operator was on duty for 34 hours and 09 minutes without a legal rest period. In this 34 hour and 09 minute period he flew 4 sectors, totaling 20-hours and 19 minutes flight time.

Flight hours during the last 30 days: 161 hours and 34 minutes.

1.5.1.6 Flight Operator (Load Master):

Cherbakov Evageni Dimitrovich, age 36 years, Russian national.

Russian Flight Operator Licence number VIII BO No 000899, valid to 21.05.2000.

1.5.1.7 Aircraft Maintenance Engineer

Padkolzine Alexander Feodrovich, age 38 years, Russian national.

Russian Aircraft Maintenance Licence number R-1 NO 0038445, issued on 28.01.1998, AN-12 rated.

1.5.1.8 Employee of Skycabs (Pvt.) Limited:

Elpage Sebastian Jayasiri Gunasekera, age 51 years, Sri Lankan national. Employed at Skycabs (Pvt.) LTD as a Cargo Executive.

1.5.2 At Air Traffic Control Units:

There were two Approach Radar Controllers and one Aerodrome Controller involved in providing air traffic control service during the last phases of the flight, as follows.

1.5.2.1 Approach Radar Controller:

Ajith Nandana Wickremarachchi, age 41 years, Sri Lankan national, employee of Airport and Aviation Services (S.L) Limited.

Air Traffic Controller Licence number 56 issued by the Department of Civil Aviation, Sri Lanka, valid till 09/11/2000. Approach Radar Control rating valid till 16/08/2000.

1.5.2.2 Approach Radar Controller:

Warnakulasooriya Xavier Sunil Croos, age 46 years, Sri Lankan national, employee of Airport and Aviation Services (S.L) Limited.

Air Traffic Controller Licence number 49 issued by the Department of Civil Aviation, Sri Lanka, valid till 15/04/2001. Approach Radar Control rating valid till 19/10/2000.

1.5.2.3 Aerodrome Controller:

Sanjaya Chandimal Disapathige, age 34 years, Sri Lankan national, employee of Airport and Aviation Services (S.L) Limited.

Air Traffic Controller Licence number 92 issued by the Department of Civil Aviation, Sri Lanka, valid till 11/01/2001. Aerodrome Control rating valid till 19/05/2000.

1.6 Aircraft Information

1.6.1

Aircraft Type	:-	AN-12 T bk.
Serial Number	:-	8346004
Date of Operation of the aircraft	:-	8th October 1968
Registration	:-	RA – 11302
Owner	:-	Antey, Engineer Street 1, Omsk, Russia
Certificate of Registration	:-	No. 5167/96 - (according to Federal Services of Air Transport Russia C of R has been cancelled on 21.10.99; Refer to Paragraph 1.17.3)
Certificate of Airworthiness	:-	No. HP-1863 – (Refer to Paragraph 1.17.3)
Maintenance Log (onboard)	:-	Not recovered from the wreckage

Certification after last overhaul :- 26.06.1998

Recorded last periodic maintenance:-19.01.2000

1.6.2 Engines

Type & Model :- An 20 M Series 6A

Engine Position	1	2	3	4
Serial Number	H- 29226036	H-27846036	H-27846019	H-27926026
Hours since last	New engine No overhauls	4558	3769	3776

Overhaul	done			

1.6.3 Propeller

Type & Model :- AV 68I

Propeller Position	1	2	3	4
Serial Number	H 115210406	H 075210010	H 110260608	H 102T87
Hours since last Overhaul	629	2008	629	2623

1.6.4 Airframe History

Total Airframe Hours since manufacture :- 7241 Hrs.
Total landings :- 4651
Hours Since Last Overhaul :- 517
Hours since last periodic inspection :- Not available

1.6.5 Aircraft Modification Status

Not determined

1.6.6 Aircraft Load

As per the Flight Manual of the aircraft the Maximum Take-off Weight (MTOW) is 61000 kg. However, the actual weight of aircraft at take off from Bangkok was at 62804 kg.

The cargo weight was 13428 kg.

1.6.7 Fuel

Type of fuel used was Jet A -1. Fuel on board at departure from Bangkok was 14981 kg.

1.7 Meteorological Information

1.7.1 Synoptic Weather Situation

Formation of cumulonimbus clouds was initially observed towards the southwest of the aerodrome at BIA Colombo during the late afternoon (0610 hours) on the day of the accident. By 0710 hours, the main thunderstorm started developing over the land area and gradually developed to cover the whole eastern sector of the aerodrome within two hours (0910 hours). Another one hour and fifty minutes later all sectors except for the West and Northwest (W, NW) were covered. Between 1100 hours - 1200 hours, the active portion of the thunderstorm was over the

BIA Colombo airfield and vicinity. By this time the aerodrome experienced severe thunderstorm activity and heavy rain which lasted a little more than an hour. The surface winds at the aerodrome as reported in the Metars and Specis show fairly steady winds, which went up to maximum 20 knots at times with directional changes when the thunderstorm set in. The ground visibility was reported to have reduced to 1000 meters at the start of the severe thunderstorm activity and heavy rain at 1100 hours before slightly improving to 2000 meters at 1150 hours.
Along with the drift of the thunderstorm towards the western coastal area and sea, the weather conditions over the airfield and vicinity of the aerodrome improved. At 1210 hours, the visibility had increased to 6 kms.

The thunderstorm and rain became moderate at the aerodrome after 1240 hours, before ceasing nearly two and half-hours later at 1510 hours.

1.7.2 Forecast Conditions

1.7.2.1 Before the flight-departed Bangkok, the crew has obtained the Terminal Area Forecast (TAF) for BIA Colombo valid for 24th March 2000 from 0000 hours to 2400 hours, which was recovered from the wreckage. TAF forecasted, between 0900 - 1500 hours, FEW cumulonimbus clouds at 2000 feet at the BIA Colombo.

1.7.2.2 The Significant Weather Prognostic Chart FL240-FL450 prepared by Meteorological Office in Bangkok Airport, effective during the time of the accident shows isolated embedded cumulonimbus clouds up to FL 420, broken layer clouds up to FL 300, thunderstorm and moderate icing up to FL 280 which effects southern part of Sri Lanka including the BIA Colombo. There was no evidence recovered from the crash site to confirm that the crew was in possession of this information.

1.7.2.3 The Significant Weather Prognostic Chart prepared at 0600 hours on 24th March 2000 by the BIA Colombo Meteorological Office shows, amongst other conditions, isolated cumulonimbus clouds and active thunderstorms along with moderate to severe aircraft icing and severe turbulence from altitude 2000' to FL 360 which covers the whole landmass of Sri Lanka except for the northern peninsula. This weather situation extends eastwards to cover the entire route of the aircraft from Bangkok to BIA Colombo.

1.7.2.4 The 500hPa Wind Chart at FL 180 obtained from the Department of Meteorology, Colombo indicates that the winds en-route had been easterly, varying at 5-15 knots.

1.7.2.5 Satellite pictures on weather condition over Sri Lanka taken by the Department of Meteorology, Colombo, at 1033 hours on 24th March 2000 shows elongated and extensive weather with embedded thunderstorm covering the entire western cost and extending inland to the island.

The picture at 1227 hours taken on the same day shows further spreading of the clouds to cover almost entire island and sea off the West Coast of the island. The processed version of this picture indicates the drift of the severe thunderstorm activity towards the west, off the coastline from the landmass.

1.7.3 Weather Reports Passed

1.7.3.1 The aircraft contacted the Area Control Centre of the Colombo Air Traffic Control at 1016 hours and reported position. The Area Controller, at 1020 hours passed the following met report to the aircraft.

" Surface Wind	270/12 knots
Visibility	10 km
Weather	negative
Clouds	scattered 1200 ft scattered Charlie Bravo 1800 ft NE, E, SE, S, broken 10,000 ft
Temperature and dew point	29º and 25º
QNH	1005
Runway	22 "

The Metars issued by the Meteorological Office at BIA Colombo, transmitted by the Aeronautical Communications Centre at BIA Colombo and received by the Area Control Centre, corresponding to the above time period are as follows.

Time UTC	Wind º/Knts	Visibility Km	Weather	Clouds	Temp/ DewPt º	QNH HPA	Trend
0940	270/10	10	Nil	S015 F018 CB NE, E, SE, S B300	31/25	1006	NOSIG
1010	270/12	10	TS	F012 S015 S018 CB NE, E, SE, S B100	29/25	1005	NOSIG

(*Abbreviations:* UTC - *Co-ordinated Universal Time*, QNH - *Pressure,* CB - *Cumulonimbus Clouds,* TS - *Thunderstorm*)

1.7.3.2 The Meteorological Office at the BIA Colombo issued the following Sigmet at 1015 hours.

VCCC Sigmet 01 Valid 241015/241415 UTC VCBI

Colombo FIR CB/TS Obsd/Fcst Tops FL360 Over Most Parts of Sri Lanka Including VCBI/VCCC Airfields and Vicinity.

The Area Controller, on receipt of this, passed it to the aircraft at 1040 hours as follows.

"There is a sigmet valid up to 1415 UTC, Colombo FIR CBs, Thunderstorms were found having tops up to FL 360 over Sri Lanka including Colombo and Ratmalana airfields and now contact Colombo Director on 132.4 Mhz."

1.7.3.3 The aircraft contacted the Approach Radar Controller (RT Call Sign: Director) at 1042 hours. The crew was briefed time and again by the Director on the prevailing weather conditions.

1.7.3.4 The Meteorological Office at the BIA Colombo issued the following Metars and Species from 1040 hours to 1210 hours. These met reports have not been directly passed to the aircraft but based on them and weather briefings from the Control Tower, Approach Radar Controller (Director) has passed relevant weather information time and again.

Report Type	Time UTC	Wind º/Knts	Visibility Km	Weather	Clouds	Temp º	Dew pt º	QNH HPA
Metar	1040	250/12	99	TS	S012 B015 S018 Cb N NE E SE S SW OVC 100	29	25	1006.1
Speci	1100	120/20	1000m.	+TSRA	S008 B015 S018 CB N NE E SE S SW OH OVC 080	29	24	1007.3
Metar	1110	120/20	1000m.	+TSRA	S008 B015 S018 CB N NE E SE S SW OVC 080	25	23	1007.5
Metar	1140	170/08	1000m.	+TSRA	S008 B015 S018 CB N NE E SE S SW W NW OH OVC 080	25	23	1007.7
Speci	1150	300/10	2000m.	+TSRA	S008 B015 S018 CB N NE E SE S SW W NW OH	23	23	1007.9
Metar	1210	250/08	6000m.	+TSRA	S008 B015 S018 CB N NE E SE S SW W NW OH OVC 080	23	23	1007.2

1.7.4 Weather condition at the time of the accident

The weather at the aerodrome had been improving since 1150 hours and the visual observation as reported to aircraft by the Director indicates light and variable wind, ground visibility at six-kms and light rain over the field. The runway-in-use for the approach of the aircraft was Runway 22.

There had been moderate rain over the area of the accident with thunder and lightning and low visibility, which was the observation of the local people. The accident occurred at 1804 hours local time. The natural light conditions at this time had been becoming dark. It further deteriorated due to rain and overcast conditions.

The sun set was at 1851 hours local time on 24th March 2000.

1.8 Aids to Navigation

1.8.1 In the aircraft

The following equipment is reported to have been installed.

Instrument	Type
♦ Radar	Roz 1
♦ Transponder	S0M-64
♦ DME	SD-67
♦ Navigational Landing System	KURS-MP-2
♦ Radio Altimeter	RV-5

1.8.2 On the ground

1.8.2.1 The following radio navigational and instrument approach aids were available at the BIA Colombo.

ILS:

Runway 22:	Performance Category 1 ILS/DME Frequency 110.3 MHz (IKA), CH 40X GP Frequency 335 MHz
Runway 04:	Performance Category 1 ILS/DME Frequency 109.9 MHz (IKW),CH 36X GP Frequency 333.8 MHz
OM Runway 22:	Frequency 75 MHz
NE Locator Runway 22: (Co-located with OM)	Identification CNL Frequency 315 kHz
OM Runway 04:	Frequency 75 MHz
SW Locator Runway 04: (Co-located with OM)	Identification ASL Frequency 330 kHz
DVOR/DME:	Identification KAT Frequency 112.7 MHz CH 74X

All the ground navigational aids listed above were reported serviceable and operating.

Primary Approach Radar equipment is of French make, Thomson-CSF and had been serviceable and operating.

The Instrument Approach (ILS) Charts for Runway 22 and 04 respectively and the Aerodrome Chart for BIA Colombo are attached as Appendix 2 in Section 5 of this Report.

1.8.2.2 The following visual ground aids were available at the BIA Colombo for Runway 22 and Runway 04.

Runway edge lights
Runway centerline lights
Threshold lights
PAPIs
Approach lights

All ground lighting aids were reported serviceable and operating.

1.9 Communication

The pilots communicated with ground through the Radio Operator. The transcript of two-way radio communication between the aircraft and the air traffic control has evidence on communication difficulties due to lack of fluency of the flight crew in English language.

There were no reported deficiencies on the two-way radio communication systems.

Transcripts of all radiotelephony (RTF) communications between the aircraft and Area Control Centre-Colombo Air Traffic Control, Approach Radar

Control Centre (Director) and the Control Tower at the BIA Colombo were obtained and attached as Appendix 3 in Section 5 of this Report.

1.10 Aerodrome Information

The Runway at BIA Colombo is of Asphalt Porous Friction surface and has dimensions of 3350 meters by 45 meters. The airport elevation is 9 meters.

1.11 Flight Recorders

The aircraft carried a Flight Data Recorder (FDR), two Cockpit Voice Recorders (CVRs) - one main and one standby, and another recording device, namely, Recorder K3 - 63.

FDR

Make & Model :- MSRP - 12 - 96
Serial Number :- 32587
Tape Driving Mechanism :- 55744

The FDR is capable of simultaneously recording 12 parameters on a magnetic tape. It had recorded parametrical information up to the moment of de-energizing. The quality of the recordings in the magnetic tape is satisfactory as confirmed by the Russian Authorities.

CVR Main

Make & Model :- 1 F 01- B
Serial Number :- 413123

The main CVR has not recorded any information. It had no spools installed. There was a ' Match Stick ' inserted in the recording head mechanism apparently to prevent 'tape not installed' caution appearing in the cockpit.

CVR Standby

Make & Model :- MC 61-B
Serial Number :- No. 21 series 191

The standby CVR has not recorded any information. It had only one spool installed and the other spool was missing.

Recorder

Make & Model :- K 3 - 63
Serial Number :- 70639

The Recorder K3 - 63 has recorded flight parameters as confirmed by the Russian Authorities.

The parametrical information in the FDR and Recorder K 3 - 63 were processed and analyzed by the Directorate of Scientific-Technical Investigation of Aviation Accidents in Air Transport at the Inter State Aviation Committee, Russian Federation and are attached as Appendix 1 in Section 5 of this Report.

1.12 Wreckage & Impact Information

After all the four engines stopped, the aircraft entered in to a controlled glide and cut through several coconut trees before crashing on the houses and ground. The left wing had separated first and had broken into several pieces in the process. The right wing too had separated from the main fuselage. All the four engines had got separated and dropped at four places before the main fuselage came to a rest. All four propellers were in the feathered position prior to ground impact.

The cockpit and the front portion of the fuselage had separated from the main section of the aircraft fuselage. The cockpit and its instruments had been further damaged and displaced during the rescue operation to remove the victims from the aircraft as well as those who were buried under the collapsed houses. The Wreckage Distribution Chart is attached as Appendix 4 in Section 5 of this report.

1.13 Medical and Pathological Information

Post-mortem examination revealed that five Russian nationals and the Sri Lankan national on board succumbed to the multiple injuries suffered in the accident.

No evidence was found to suggest that any medical factors had influenced the course of the accident.

1.14 Fire

There had been two isolated minor fires where the main wing tank and the Auxiliary Power Unit (APU) were found. Both the fires had not spread to other areas and had extinguished on its own.

1.15 Survival Aspects

The Captain and Co-Pilot survived the accident, the remaining six occupants were killed from multiple, lethal injuries.

The Captain received serious injuries and was unconscious. The Co-Pilot was conscious with injuries.

The Investigating team was unable to determine the condition of the cockpit, seats and seat belts survivability due to the damage done by heavy equipment used in search and rescue operations.

1.16 Test and Research

Reading the FDR and Recorder K3-63 and analyzing its data was carried out by the Directorate of Scientific - Technical Investigation of Aviation Accidents in Air Transport, Interstate Aviation Committee, Russia.

1.17 Organizational and Management Information

1.17.1 The Department of Civil Aviation, Sri Lanka

Civil aviation in Sri Lanka is regulated under the Ceylon Air Navigation Regulations (ANR) of 1955 made under the Air Navigation Act of 1950.

An assessment conducted by an ICAO team in 1997 highlighted the lack of procedures in the Department of Civil Aviation for initial certification and continuing surveillance of Air Operators and Maintenance Organizations in Sri Lanka. The lack of adequately qualified personnel to discharge the State's responsibilities in regulating civil aviation in the country too was a highlight of the assessment.

As a result of the very same shortfalls, granting of the airline licence to Skycabs (Pvt.) Limited was neither subjected to a detailed certification process nor to a continuing safety oversight programme since inception of the operations of the airline.

Consequent to the ICAO assessment in 1997, the Sri Lankan Government, recognizing the need to enhance the safety oversight capabilities of the Department, launched a Project with the assistance of the Technical Co-operation Bureau of the ICAO in 1998 to enhance the safety oversight capabilities of the Department.

Until the establishment of this Project, the Skycabs cargo operation had not been subjected to an effective regulatory system, from it's inception till late 1998.

This accident took place at a time when the Department was in the process of introducing a new Civil Aviation Act, Civil Aviation Regulations and Implementing Standards and acquiring and training local staff under the ICAO Project to discharge State's responsibilities to meet the ICAO requirements.

Immediately after the accident, all cargo operators in Sri Lanka were grounded pending re-certification under the new guidelines developed to meet international requirements.

1.17.2 Sky Cabs (Pvt.) Limited

Sky Cabs (Pvt.) Ltd. was initially issued with an airline licence in 1993. This was during the period when the Department of Civil Aviation was not properly equipped to discharge its duties as described in the above paragraph.

Since 1999, the Department was in regular dialogue with this Operator to modify its operation to satisfy international requirements.

On 3rd May 2000 an audit was conducted with the assistance of COSCAP-SA (Co-operative Development of Operational Safety and Continuing Airworthiness Programme - South Asia) to determine the compliance of the Air Navigation Act, Air Navigation Regulations and safety standards by Skycabs (Pvt.) Limited.

The audit report revealed that the Skycabs (Pvt.) Limited had not developed and submitted for approval, the required Manuals to ensure that operations are conducted in a safe manner in conformity with Air Navigation

Regulations of the country. The audit report further revealed that the airline had contravened numerous Regulations and Safety Standards.

1.17.3 Wet Lease Operation

The subject aircraft (AN-12, Russian Registration number, RA 11302) owned by Antey Company of Russia was wet leased to Sky Cabs (Pvt.) Ltd. An Aircraft Lease Agreement signed by Antey Company and Skycabs (Pvt.) Limited was submitted to the Department of Civil Aviation, Sri Lanka on 27th October 1999. Further, Skycabs (Pvt.) Limited submitted to the Department of Civil Aviation, Sri Lanka, a letter issued by the Federal Air Transport Authority of Russia which stated that, "Federal Air Transport Authority has no objection to rent out aircraft registration Nos. RA - 11301, RA - 11302 and RA - 11367 owned by Antey Air Company, Omsk, Russia, to Skycabs, No.294, Union Place, Colombo 2, on condition that all necessary documents and formalities required from both parties should be fulfilled. Standard documents should be prepared, in accordance with FATA Russia and Department of Civil Aviation."

However, the letter dated 17.07.2000 sent to the Department of Civil Aviation by the Federal Services of Air Transport, Russia states that such a letter was not issued by them. Hence the above letter forwarded to the Department of Civil Aviation appears to be a forged document.

The approval granted to Skycabs (Pvt.) Limited by the Department of Civil Aviation, Sri Lanka to operate the aircraft, Registration Number RA - 11302 expired on 07th March 2000. Thus the flights done by the aircraft, RA11302 after this date did not have approval of the Department of Civil Aviation, Sri Lanka.

The flight schedule of Skycabs (Pvt.) Limited for the month of March, 2000 had not been submitted to the Department of Civil Aviation, Sri Lanka for approval. Thus the airline did not have the Route Approval for the flight SCB 702, Bangkok - Colombo done on 24th March 2000.

On an inquiry made by the Director General of Civil Aviation, Sri Lanka, the Federal Aviation Authority (FAA) of Russia informed on 06th May 2000 that the Air Operators Certificate (AOC) issued to Antey Company by the FAA of Russia had been suspended on 20th March 2000.The Department of Civil Aviation, Sri Lanka had not been aware of this suspension.

The Federal Services of Air Transport, Russia informed on 17th July 2000 that, "Original certificate of Registration of civil aircraft AN-12 RA -11302 bearing No. 5167/96 was returned to Federal Services of Air Transport Russia and was cancelled on 21.10.99. You were presented with a photocopy of already cancelled above-mentioned document. Similar copy was onboard during the operation by aviation company "Sky Cabs". Certificate of Airworthiness bearing No. BP-1863 was issued when this aircraft was operated by Russian aviation company "Elbrus-Avia" and was not transferred to the new operator that is aviation company "Antei". In this way aviation company "Antei" had operated aircraft AN-12 RA-11302 in Sri Lanka, violating regulations of Chicago convention on international civil aviation and requirements of air codes of Russian Federation."

1.18 Additional Information

1.18.1 Exceeding Flight Time Limitations

The accident investigators found evidence from the previous flight plans retrieved from the crash site that the aircraft and same crew had flown 161 hours and 34 minutes during the last 30 days. They were continuously on duty for 34 hours and 09 minutes without a legal rest period up to the time of the accident. During this period the crew flew 4 sectors in 20 hours and 19 minutes of flight time immediately prior to the crash.

The crew held Russian Flight Crew Licences. Therefore, the crew was bound to comply with the Russian Regulations on Flight Time Limitations.

The Civil Aviation Regulations of FAA Russia limit the flight time of aircrew on aircraft type AN 12 to 75 (seventy five) hours per month and 750 hours per year.

1.18.2 Exceeding Maximum Takeoff Weight

The Maximum Take-Off Weight of the aircraft was 61 tons. The load sheets retrieved from the crash site revealed that the crew operated the aircraft over this limit, 22 times out of the last 50 flights.

1.18.3 Fuel Policy

The Fuel and Oil Supply which is required for this flight as per Paragraph 4.3.3.1 (b) of the Sixth Schedule is, "to fly to the aerodrome of intended landing and thence to an alternate aerodrome or to fly to an alternate aerodrome via any predetermined point specified in the flight plan, and thereafter, in either case for forty five minutes at normal cruising speed". The aircraft did not comply with the above fuel requirements as required by the Air Navigation Regulations of Sri Lanka.

The first missed approach on ILS Runway 04 was executed at 11:07:20. Eight minutes and thirty seconds later the aircraft reported the remaining endurance as 50 minutes. The flight planned alternate, Male International in the Republic of Maldives was one hour and forty five minutes away from the destination.

The accident investigators found evidence from the previous flight plans and aircraft load sheets that same crew operated without satisfying legal fuel requirement 29 times out of the last 50 flights.

1.18.4 Diversion to a Domestic Airfield

At 11:14:00 hrs, the aircraft requested a diversion to Ratmalana Airport twenty aerial nautical miles south of BIA Colombo. This is not an authorized alternate for International traffic. This airfield is used for domestic civil and military flights only. No aircraft movement is allowed without the permission of the military. The Radar Controller turned down the request for a diversion on the advice of the Ratmalana Tower Controller as saying " Skycabs 702 advising you the full length of the runway at Ratmalana not available. You can't land on the runway Ratmalana."

It is observed that there is no alternate airport for international air traffic, situated within the country.

The following notam, number C0011/00 dated 25.02.00 was effective during this period in respect of construction work on the runway at Ratmalana Airport.

"VCCC 0002250600 - 0003250600 EST
Rwy usable length of 2907 ft from Rwy22 end due Rwy resurfacing work in progress within the portion of 3107 ft from Rwy04 end."

1.18.5 Declaration of Emergency

Only conversation between the aircraft and the controller regarding fuel was at 11:15:50 hrs when the approach radar controller requested SCB 702's remaining endurance and the aircraft replied as saying “50 minutes of fuel remaining”.

As per the Section 174 of the Air Navigation Regulations of Sri Lanka, the Pilot-in-command is required to transmit emergency signals according to the degree of emergency. The signals applicable in this instance are transmissions of “Mayday” or “Pan” over radiotelephony.
The aircraft failed to declare an emergency up to the time of the accident.

1.18.6 Statement of the Co-pilot

The Co-pilot who survived the crash made a statement to the Investigation Team on 27th March 2000.

He stated that on the first attempt to land, the crew encountered thunderstorm and intense rain, due to which, a missed approach procedure was carried out. The second attempt to land was aborted due to poor visibility. During the third approach, fuel onboard reached a critical level and moments after, the aircraft engines stopped due to lack of fuel

The Co-pilot added that there were no mechanical or other problems experienced by the crew.

The statement made by the Co-pilot is attached as Appendix 5 in Section 5 of this Report.

1.18.7 Crew Status

The Aircraft Lease Agreement between the Air Company Antey and Sky Cabs (Pvt.) Ltd., as submitted to the Department of Civil Aviation, Sri Lanka is attached as Appendix 6 in Section 5 of this Report.

The crew status is reflected in this agreement.

2.0 ANALYSIS

2.1 General

The evidence confirmed that this accident occurred when the aircraft engines lost power from fuel exhaustion while the flight was maneuvering for a third approach to the BIA Colombo.

The Co-pilot who survived the crash stated that the engines stopped due to lack of fuel.

The pattern of pressure falling in all four engines torque indicators, registered by the FDR corresponds to engine shut down due to stopping of fuel supply, which confirms the statement, by the Co-pilot.

There was an absence of fuel odor at the site. There was no major fire erupted from the fuel tanks during the ground impact of the aircraft. There had been two minor fires where the main wing tank and the Auxiliary Power Unit were found. Both the fires had not spread to other areas and had extinguished on it's own.

There was no rotational damage to any of the four propellers from impact forces, which were in the feathered position indicating that they had ceased operation before ground impact.

All the evidence above leads to the conclusion that all four engines of the aircraft ceased operation in flight due to fuel starvation.

The investigation revealed that the flight crew of the AN-12 aircraft was in possession of valid and current licences issued by the Federal Aviation Authority of Russia. Further, the crew had recent experience in operating AN-12 flights between Colombo and Bangkok.

The investigation revealed that the aircraft departed Bangkok, Thailand with 14981 kg of fuel onboard based on the fuel figure notations made by the flight crew in onboard documents, which were found at the crash site. The fuel requirement as per the Sri Lankan Air Navigation Regulations (ANRs) should have been trip fuel, fuel to alternate airport and reserve fuel of 45 minutes at normal cruising speed.

The scheduled flight time was 5 hours and 20 minutes. The aircraft crashed 6 hours and 24 minutes after take-off. Hence the fuel onboard was only sufficient to fly to the destination airport, BIA Colombo (VCBI) and then fly for 01 hour and 04 Minutes. The filed alternate airport was 01 Hour and 45 Minutes away.

This indicates that the flight SCB 702 had sufficient fuel to complete the schedule flight, but not adequate fuel to fly to the alternate airport and reserve fuel as required by Sri Lanka Air Navigation Regulations.

The investigation revealed inadequacies in the flight planning of SCB 702 to Colombo. Deficiencies in operational flight plan and flight & duty times too were observed.

The investigation also revealed inadequacies in radiotelephony communication of the crew and air traffic control procedures.

Consequently, the analysis of this accident focused on the Planning and Dispatching of the flight, the flight crew's performance and the communications between the pilots and air traffic controllers during the flight and air traffic control procedures.

2.2 Flight Planning

The investigating team found deficiencies in the planning and dispatching of the flight SCB702.

The investigation team could not establish the exact weather information collected by the crew before departure from Bangkok. The Terminal Area Forecast valid for BIA Colombo, recovered from the crash site was effective from 0001 hours to 2400 hours on 24th March 2000.

These data showed that the weather at the destination Airport was forecast to have cumulonimbus clouds at the expected time of arrival of SCB 702 in BIA Colombo. There was no evidence found in the crash site to show that the crew had collected weather data for the alternate aerodrome-Male International (VRMM) in the Republic of Maldives.

With regard to fuel planning, the SriLankan ANR requires sufficient fuel to the aerodrome of intended landing and then to an alternate aerodrome and thereafter fly for forty-five minutes at normal cruising speed. The investigating team found that the crew had operated without the required alternate fuel, 29 times out of the last 50 flights.

The crew had exceeded the flight time limitations by flying in excess of 161 hours in the last 30 days. They were continuously on duty in excess of 34 hours (out of which 20 hours and 19 minutes was flight time) immediately prior to the crash.

The investigation also found that, out of the last 50 take-offs, the aircraft had exceeded the Maximum Take-Off Weight of 61 tons, 22 times.

This shows that the Operator did not exercise proper operational control over the operations of the airline as envisaged by the Air Navigation Regulations of Sri Lanka. Further the operator has acted in contravention of many applicable Regulations under which the airline has been licensed.

2.3 Cockpit Voice Recorders (CVRs)

The two Cockpit Voice Recorders (CVRs) installed in this aircraft were made in-operative deliberately by inserting a match stick in the recording head mechanism in the main CVR and not installing the receiving spool in the Stand-by CVR.

In the absence of the CVR data, it is not possible to ascertain the concerns that the flight crew most probably would have had on prevailing meteorological conditions and deteriorating fuel status. It also is not possible to ascertain the degree of comprehension of air traffic control communications by the crew.

2.4 Flight Data Recorder (FDR)

The Directorate of Scientific-Technical Investigation of Aviation Accidents in Air Transport in the Inter State Aviation Committee, Russia carried out the processing of recorded information in the FDR and the Recorder K 3-63 in the laboratories of their Directorate in Russia and also analyzed the information along with the air traffic control radio telephony communication recordings. The Report submitted by the Inter State Aviation Committee, Russia is attached as Appendix 1 in Section 5 of this Report.

The analysis of the FDR was made from the last 1 hour and 29 minutes of flight; this was then processed along with the ATC taped communications (reports of bearing and distance from DVOR/DME KAT and reports of the aircraft course). The quality of the recordings in the magnetic tape was satisfactory. The flight data recorder had recorded parametrical information up to the moment of de-energizing.

Accuracy of synchronization of the flight parametrical information and voice information recorded by the flight data recorder and ATC tape respectively constitutes ±10 seconds.

By doing this calculation process, a flight path was drawn from top of descent to the point of impact.

Analysis of FDR data and the plotted flight path of the aircraft show that on the first ILS approach to runway 04, the aircraft descended to a height of around 80-100 meters (262- 328 feet) at about 2 miles from the runway before making go-around. The data from the FDR indicated that the aircraft was possibly in turbulence, which probably was a contributory factor to the crew's decision to go around.

Analysis of FDR data and the plotted flight path of the aircraft show that on the second ILS approach to runway 04, the aircraft descended to a height of around 80-100 meters (262-328 feet) at about 6.5 miles from the runway before going-around.

The final flight path shows the aircraft was maneuvering to intercept the ILS for runway 22. At the height of approximately 200-250 meters (656- 820 feet) and the speed of 310-315 km/h (167-170 knots) engine shut down occurred in succession number 3-number 1 engines and within 3.5 seconds, simultaneously number 4-number 2 engines.

The pattern of pressure falling in all four engines torque indicators corresponds to the engine shut down due to the stopping of fuel supply.

2.5 Pilot and ATC Communication

According to the statement given by the Co-pilot after the accident, it was the Radio Operator who carried out all radiotelephony communication with the Air Traffic Control.

The ATC transcript has evidence, that the crew of SCB 702 did not understand many ATC instructions, as answers were either an irrelevant, inaccurate or no reply. Soon after the initial contact with Colombo ATC, SCB 702 was asked, “702 have you got a weather radar on board”. SCB 702 replied “8 on board”, again ATC asked, “Do you have a weather radar”, SCB 702 replied, “Copied, copied SCB 702”. The accident investigation team was not able to determine if SCB 702 had functional weather radar on board the aircraft.

The plotted flight path indicates that many ATC heading changes were ignored by SCB 702, many of these heading changes were radar vectors to either avoid weather or vectors to the Airport. It is not clear whether the crew was circumnavigating the weather or just did not understand the ATC instructions. In most instances, the flight crew never asked for clarifications of ATC instructions. The Accident Investigation Team is of the opinion that lack of fluency of the crew in communicating in English Language aggravated the situation.

It is noted that the air traffic controllers assisted the flight by passing current weather information and giving them many radar vectors both to avoid the weather and to shorten the track to the airport.

However the air traffic controllers failed to assess the deteriorating fuel situation and the impending danger to the aircraft and assist the pilot-in - command, adequately.

Although the flight crew did not declare an emergency, they did advise air traffic control at 11:16:00 hours that the remaining fuel was 50 minutes. The flight crashed approximately 48 minutes later.

Instead of low fuel status report by the Pilot-in-command, a distress signal transmitted by the aircraft as required by the Air Navigation Regulations of Sri Lanka regarding the impending danger, would have enhanced the situational awareness amongst the air traffic controllers.

This would have resulted in a better assessment of the impending danger to the aircraft by the air traffic control.

2.6 Flight Crew Performance

The flight crew was continuously on duty in excess of 34 hours out of which 20 hours was flight time. They had been flying in excess of 161 hours within the last 30 days. Stress and fatigue due to excessive hours of working and the knowledge of insufficient fuel status may have had adverse stress reactions affecting the performance of the flight crew.

2.7 Survivability

Six occupants of the eight on board were killed. According to the statement of the Co-pilot who survived, there had been little time available to carry out the emergency landing. According to his statement, on the 3rd landing attempt the flight engineer has called “all engines out”, at this stage the aircraft altitude has been 300 meters (approximately 984 feet) and at a distance of 5-6 kilometers (2.7 - 3.2 N.M.) from the airfield. The Captain has ordered to prepare for crash landing. The fuel valves were shut-off to prevent any fires and the Captain requested the radio operator to vacate the radio station for his safety.
The Captain and Co-Pilot survived the accident while the remaining six occupants succumbed to the multiple injuries suffered in the accident.

There was no evidence that the cargo was properly secured.

All First-Aid kits on board the aircraft were empty.

2.8 Meteorological Information

On initial contact, the meteorological information effective for BIA Colombo was passed to the aircraft by the area controller at 1020 hours. Though the 'weather' as reported in the Metar of 1010 hours read 'Ts' which stands for thunderstorm, the controller passed 'weather' as 'negative'. Subsequently, the controller passed a 'Sigmet' to the aircraft at 1040 hours, which reported that thunderstorms were found at Colombo airfield. From this moment onwards, the crew was kept informed of the prevailing weather conditions at the BIA Colombo airfield and along the flight path, time and again by the air traffic controllers.

It was evident to the accident investigation team, from meteorological reports, satellite weather pictures and weather information passed to the aircraft by the approach radar (Director) that there was significant weather, probably moderate to heavy turbulence, and possible wind shear encountered by SCB 702 during the first and second ILS approaches. This was confirmed by the co-pilot’s statement.

This significant weather resulted in the aircraft not being able to land, having attempted two ILS approaches.

2.9 Fire and Rescue

Fire and Rescue Services of Airport and Aviation Services (S.L) Limited (AASL) had reached the crash site less than fifteen minutes of the crash, covering a road distance of nearly six (6) kilometers. Soon after, the Sri Lankan Air Force (SLAF) Rescue Team too had arrived at the site.

Because of the timely action taken by the search and rescue teams, the Captain and the Co-pilot who were lying injured in the debris, were removed for medical treatment. Both of them survived the crash.

The investigation team observes that the services provided by the Fire & Rescue teams were satisfactory.

As per the Aeronautical Information Publication (AIP) of Sri Lanka, overall responsibility for the administration and for making necessary facilities and services available for Search & Rescue operations within Colombo Search &

Rescue Region rests with the Department of Civil Aviation, Sri Lanka. It is observed that this responsibility is not being discharged in accordance with the AIP.

2.10 Crew Status

Article 2 of the Aircraft Lease Agreement between Air Company Antey, and Sky Cabs Pvt Ltd describes the obligations of the lessor.

1) Article 2.3 requires the aircraft to be operated by the lessors' crew.

2) Article 2.4 requires the lessor to be responsible for crew and technician salaries and aircraft maintenance.

Article 3 of the lease agreement describes the obligation of the lessee.

1) Article 3.5 deals with the responsibilities towards the crew. This includes ground transportation for lessor's crew

2) Article 3.8 deals with persons accompanying cargo.

Article 7.0 of the lease agreement describes the limitations of liability.

1) Article 7.1 deals with authority of the Captain of the aircraft.

2) Article 7.4 deals with the liability on the part of the lessor for the loss and damage to aircraft and death or injury to flight crew or technical staff.

Article 01 of the Agreement contains definitions.

Definition of the term aircraft "shall mean the aircraft of the type specified in Annex 1 and being the property of and / or in the management of the Lessor"

Definition of the term Delivery airport "shall mean the airport as defined in Annex 1 to which the Lessor delivers the Aircraft to the Lessee on the commencement date, and the airport to which the Lessee will return the Aircraft to the Lessor on the termination date, complete with all necessary personnel and equipment to satisfy the requirement of this Agreement"

The above factual information points towards the only conclusion that the crew had belonged to the aviation company "Antey"

3.0 CONCLUSIONS

3.1 Findings

1. The accident occurred when the engines of the aircraft lost power as a result of fuel exhaustion while the flight was maneuvering for the third approach to land at the Banadaranaike International Airport Colombo.

2. The significant weather prevailed resulted in the aircraft not being able to land, having attempted two ILS approaches.

3. The fuel carried onboard was insufficient to fly to the planned alternate airport, Male International in the Republic of Maldives and 45 minutes of reserve fuel as required by Law.

4. There is no alternate airport situated in Sri Lanka for international air traffic bound for the only international airport in the country (BIA Colombo).

5. The flight crew had exceeded flight time limitations as specified in the Russian Civil Aviation Regulations, by flying in excess of 161 hours in the last 30 days.

   Prior to the accident, the flight crew was continuously on duty in excess of 34 hours, which included 20 hours and 19 minutes of flight time.

6. The aircraft departed Bangkok International Airport with a take off weight of 62,804 kg, which exceeded the authorized Maximum Take-Off Weight of the aircraft, 61,000 kg.

7. The flight crew never declared to air traffic control that they did not carry sufficient fuel to fly to the filed alternate airport.

8. The flight crew did not declare an emergency as required by the Air Navigation Regulations of Sri Lanka by transmitting “Mayday” or “Pan” to indicate the grave and imminent danger to the aircraft.

9. The flight crew or/and air traffic controllers who handled the flight at the Approach Radar Control Centre did not show sufficient concern about the deteriorating fuel situation until the time of the accident.

10. The Radio Operator, who made all recorded radiotelephony communications with the Air Traffic Control, was not sufficiently proficient in the English language to communicate adequately with air traffic controllers.

11. The deaths of persons onboard were the result of the fatal injuries suffered during the impact sequence of the crash landing.

12. The approval granted to Skycabs (Pvt.) Ltd. by the Department of Civil Aviation, Sri Lanka to operate the aircraft, bearing Registration Number RA-11302 expired on 7th March 2000.

13. Sky Cabs (Pvt.) Limited did not have the Route Approval from the Department of Civil Aviation, Sri Lanka for the flight SCB702 operated on 24th March, 2000.

14. The Air Operator Certificate of the Lessor, 'Antey', a Company registered in Russia was cancelled by the Federal Aviation Authority of Russia on 20th March 2000.

15. The Certificate of Registration issued to aircraft, AN-12 bearing Registration Number RA 11302 was cancelled by the Federal Services of Air Transport Russia on 21st October 1999.

16. The Certificate of Registration submitted to the Department of Civil Aviation, Sri Lanka on 27th October 1999 in respect of the aircraft, AN-12 bearing Registration Number RA 11302 was a photocopy of the above already cancelled document.

17. The 'Antey' Company did not have a valid Certificate of Registration and a valid Certificate of Airworthiness for the aircraft, AN-12 bearing Registration Number RA-11302 during the period it was leased out to Skycabs (Pvt.) Ltd.

18. The letter submitted to the Department of Civil Aviation, Sri Lanka by Skycabs (Pvt.) LTD in respect of the lease of the aircraft, AN-12 bearing Registration Number RA 11302, claimed to have been issued by Federal Air Transport Authority of Russia is a forged document.

19. The response of fire and rescue personnel had been satisfactory. They have reached the crash site promptly.

20. The Department of Civil Aviation, Sri Lanka appears not to have adequately discharged the responsibility of administration and co-ordination of Search & Rescue Services.

21. The established air traffic control procedures to handle aircraft in distress are totally inadequate.

22. The Skycabs (Pvt.) Limited failed to comply with the conditions of the Airline Licence issued to them.

23. The Department of Civil Aviation, Sri Lanka appears not to have implemented effectively, the safety oversight functions to satisfy the State's obligations as a signatory to the Convention on International Civil Aviation.

3.2 Cause of the Accident

The aircraft accident occurred due to fuel starvation.

Contributory factors to the accident are as follows.

i) Violation of Air Navigation Regulations on fuel planning;
ii) Failure of the flight crew to declare an emergency;
iii) Being unable to land due to adverse weather situation;
iv) Lack of communicability of the flight crew in English language;
v) Non-availability of established air traffic control procedures to assist an aircraft in distress;
vi) Failure of Skycabs (Pvt.) Ltd. to comply with the Air Navigation Regulations and the Conditions set-forth in Schedules issued with the Airline Licence; and
vii) Absence of an effective Safety Oversight Programme implemented by the Department of Civil Aviation, Sri Lanka.

4. Recommendations

1. The Department of Civil Aviation should take immediate action to complete implementation of the Safety Oversight Programme to discharge fully, the responsibilities of the State undertaken under the Convention on International Civil Aviation.

2. The Department of Civil Aviation shall continue to enforce the Safety Oversight Programme to the complete satisfaction of the International Safety Standards on Civil Aviation.

3. The Department of Civil Aviation should authorize Wet Lease Operations only on the following conditions.

   i) Wet Lease Operations should be allowed only for AOC holders.
   ii) Wet Lease Operations should be valid only for 3 months.
   iii) Wet lease Operations beyond 3 moths should be subjected to signing of an Agreement as per the requirements under the Article 83 bis.

4. The Department of Civil Aviation should ensure that all flight crews of aircraft operated by the holders of an Airline Operating Certificate of Sri Lanka should be able to intelligently and fluently communicate with air traffic control services.

5. The Department of Civil Aviation should restructure, reactivate and provide for Search & Rescue Services to satisfy the requirements in ICAO Annex 12 to the Convention on International Civil Aviation.

6. The Air Traffic Services should develop, document and implement procedures to assist aircraft in distress. Adequate initial training and recurrent training should be provided to air traffic controllers on such procedures.

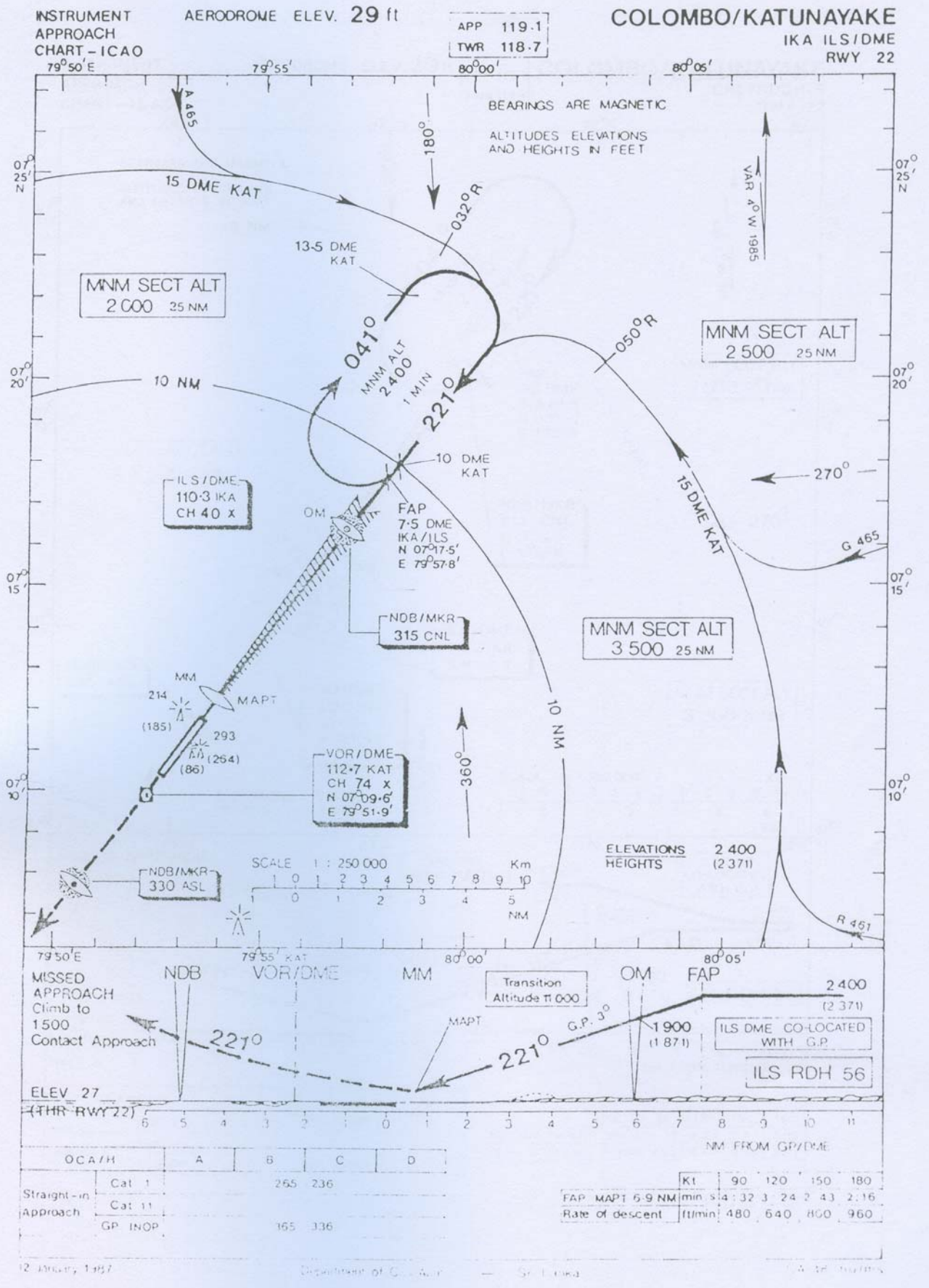
7. The requirement of a second international airport in Sri Lanka should be addressed to enhance safety of civil aviation.

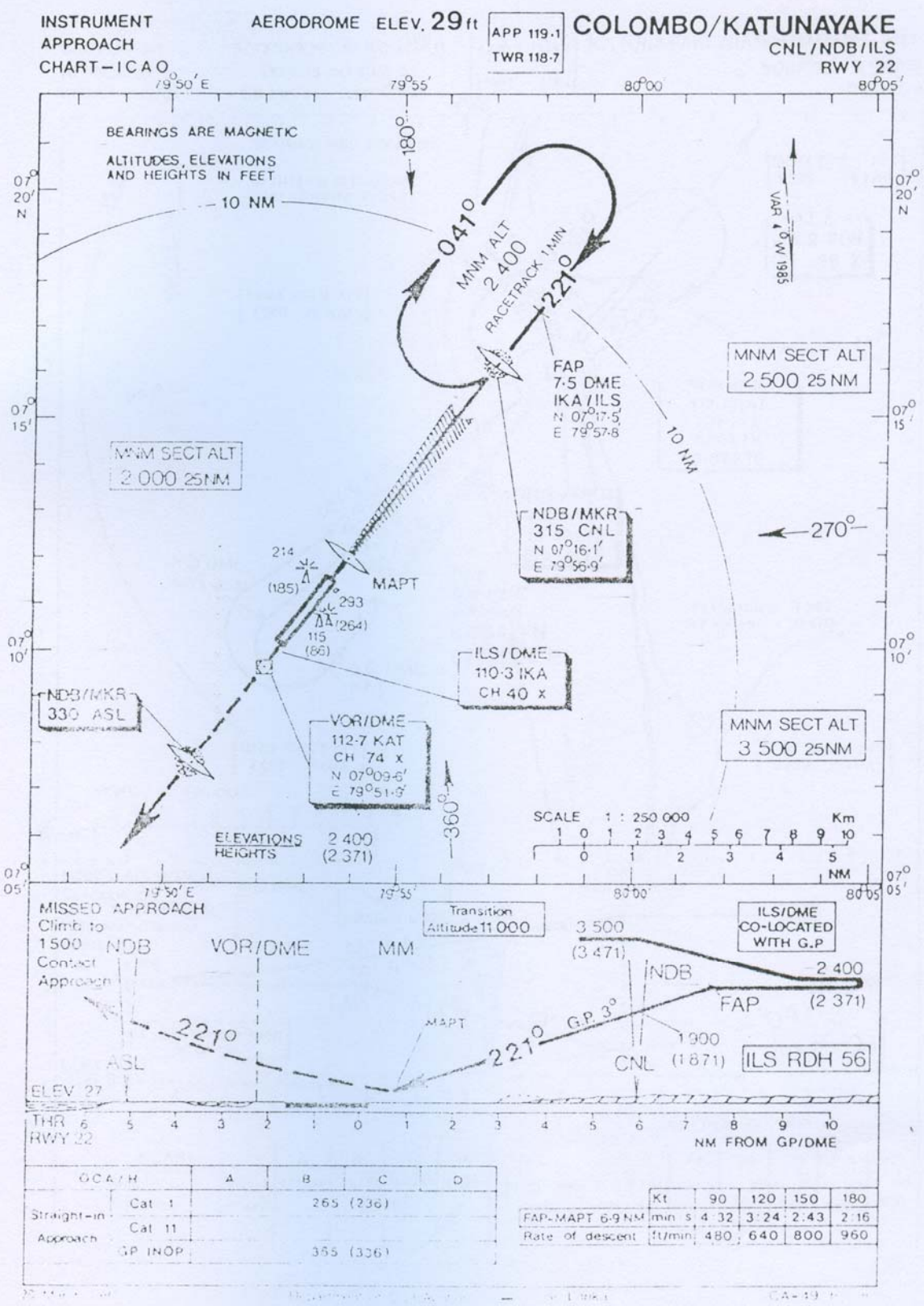
5. APPENDICES

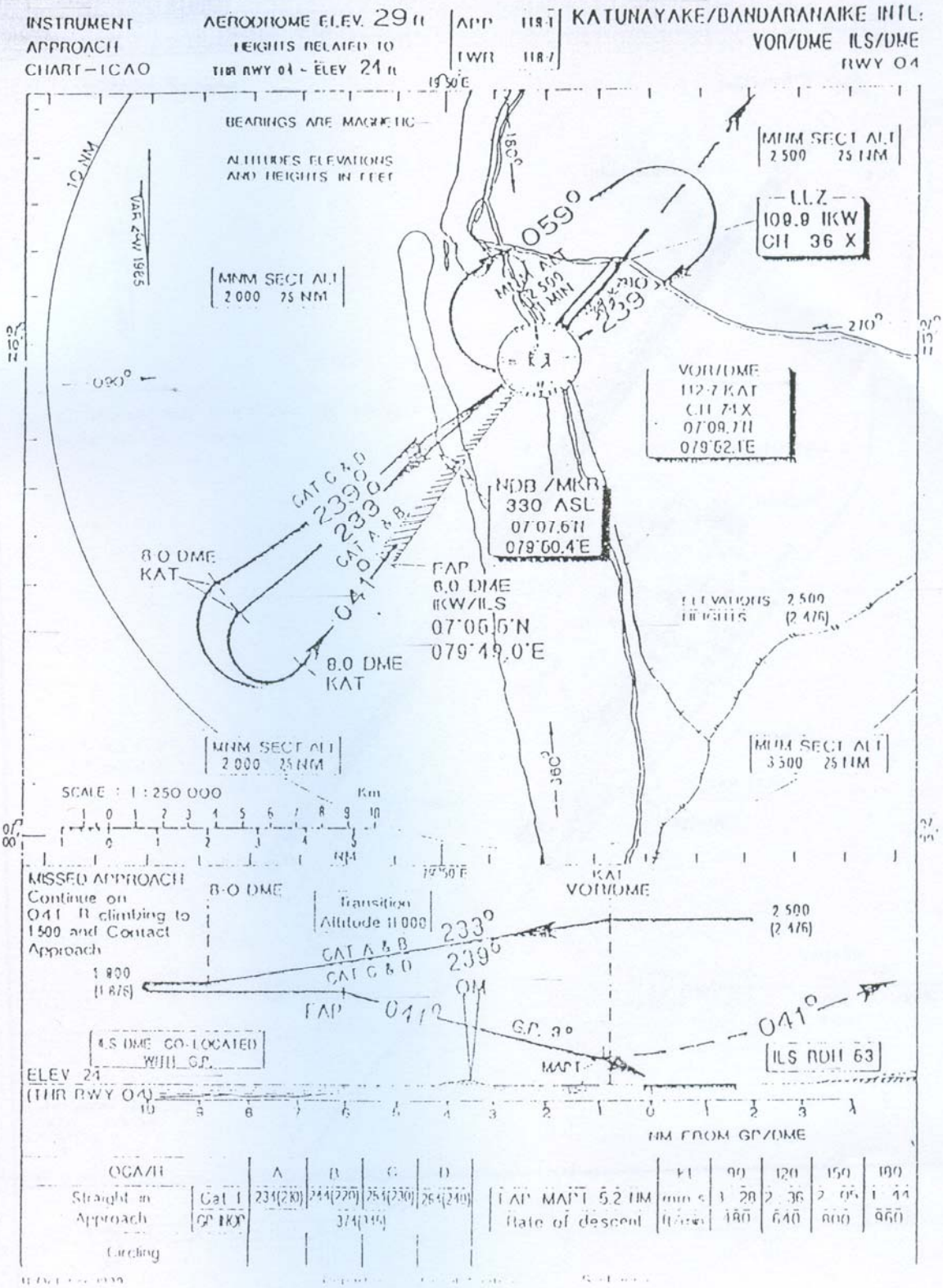
Appendix 1	-	The Report compiled by the Inter State Aviation Committee of the Russian Federation mainly based on the technical analysis of onboard data recorders
Appendix 2	-	The Instrument Approach (ILS) Charts for Runway 22 and 04 respectively and the Aerodrome Chart for BIA Colombo
Appendix 3	-	Transcripts of all radiotelephony (RTF) communications between the aircraft and Area Control Centre-Colombo Air Traffic Control, Approach Radar Control Centre (Director) and the Control Tower at the BIA Colombo
Appendix 4	-	The Wreckage Distribution Chart
Appendix 5	-	The Statement made by the Co-pilot
Appendix 6	-	The Aircraft Lease Agreement between the Air Company Antey and Sky Cabs (Pvt.) Limited

APPENDIX 1

Publication of the Appendices 1, 3, 5 and 6 withheld in compliance with Chapter 5 Paragraph 5.12 of ICAO Annex 13 to the convention.


INSTRUMENT APPROACH CHART – ICAO
AERODROME ELEV. 29 ft
APP 119·1
TWR 118·7
COLOMBO/KATUNAYAKE
IKA ILS/DME
RWY 22
BEARINGS ARE MAGNETIC
ALTITUDES ELEVATIONS AND HEIGHTS IN FEET
VAR 4° W 1985
A 465
15 DME KAT
180°
032°R
13·5 DME KAT
MNM SECT ALT 2 000 25 NM
041°
MNM ALT 2400 1 MIN
221°
050°R
MNM SECT ALT 2 500 25 NM
10 NM
10 DME KAT
270°
15 DME KAT
G 465
ILS/DME 110·3 IKA CH 40 x
OM
FAP 7·5 DME IKA/ILS N 07°17·5' E 79°57·8'
NDB/MKR 315 CNL
MNM SECT ALT 3 500 25 NM
MM
214
(185)
MAPT
293
(264)
(86)
VOR/DME 112·7 KAT CH 74 x N 07°09·6' E 79°51·9'
360°
10 NM
ELEVATIONS / HEIGHTS 2 400 (2 371)
NDB/MKR 330 ASL
SCALE 1 : 250 000
Km
NM
R 461
79°50'E
79°55'
80°00'
80°05'
07°25'N
07°20'
07°15'
07°10'
MISSED APPROACH Climb to 1500 Contact Approach
NDB
VOR/DME
MM
Transition Altitude 11 000
OM
FAP
2 400 (2 371)
MAPT
221°
G.P. 3°
1 900 (1 871)
ILS DME CO-LOCATED WITH G.P.
ILS RDH 56
ELEV 27
(THR RWY 22)
NM FROM GP/DME
OCA/H | A | B | C | D
Straight-in Approach | Cat I | 265 | 236
Cat II
GP INOP | 365 | 336
Kt | 90 | 120 | 150 | 180
FAP MAPT 6·9 NM | min s | 4 : 32 | 3 : 24 | 2 : 43 | 2 : 16
Rate of descent | ft/min | 480 | 640 | 800 | 960

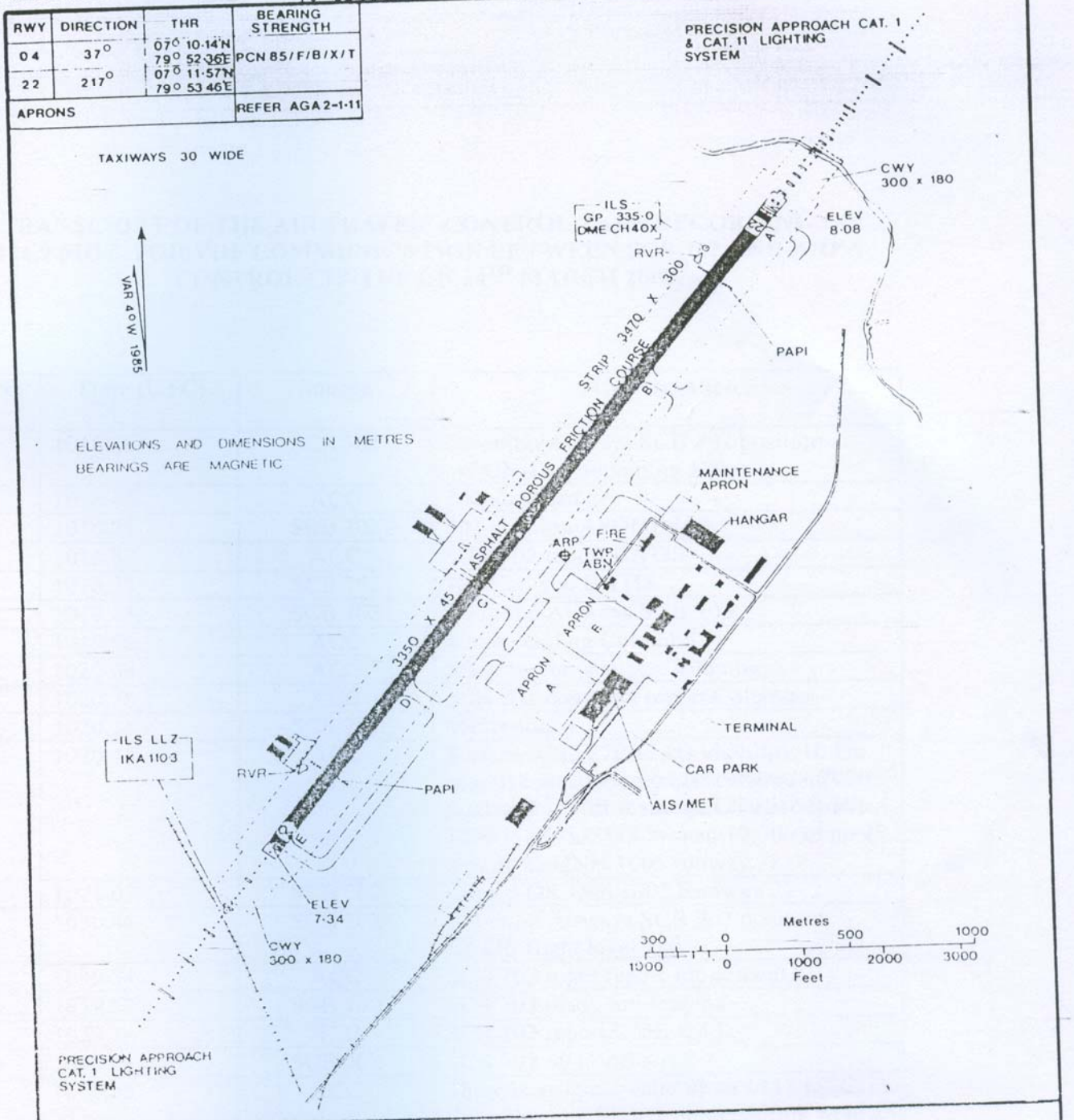

INSTRUMENT APPROACH CHART – ICAO
AERODROME ELEV. 29 ft
APP 119·1
TWR 118·7
COLOMBO/KATUNAYAKE
CNL/NDB/ILS
RWY 22
79°50′E
79°55′
80°00
80°05′
BEARINGS ARE MAGNETIC
ALTITUDES, ELEVATIONS AND HEIGHTS IN FEET
07° 20′ N
07° 15′
07° 10′
07° 05′
10 NM
180°
041°
MNM ALT 2 400
RACETRACK 1 MIN
221°
VAR 6°W 1985
FAP
7·5 DME
IKA/ILS
N 07°17·5′
E 79°57·8
MNM SECT ALT
2 500 25 NM
MNM SECT ALT
2 000 25NM
NDB/MKR
315 CNL
N 07°16·1′
E 79°56·9′
270°
214
(185)
MAPT
293
(264)
115
(86)
ILS/DME
110·3 IKA
CH 40 x
NDB/MKR
330 ASL
VOR/DME
112·7 KAT
CH 74 x
N 07°09·6′
E 79°51·6′
MNM SECT ALT
3 500 25NM
360°
SCALE 1 : 250 000
Km
NM
ELEVATIONS
HEIGHTS
2 400
(2 371)
MISSED APPROACH
Climb to 1500
Contact Approach
NDB
VOR/DME
MM
Transition
Altitude 11 000
3 500
(3 471)
ILS/DME
CO-LOCATED
WITH G.P
NDB
2 400
FAP
(2 371)
221°
MAPT
221°
G.P. 3°
1 900
(1 871)
CNL
ILS RDH 56
ASL
ELEV 27
THR 6
RWY 22
NM FROM GP/DME
GCA/H
A
B
C
D
Straight-in Approach
Cat I
Cat II
GP INOP
265 (236)
355 (326)
Kt
90
120
150
180
FAP-MAPT 6·9 NM
min s
4 32
3 24
2 43
2 16
Rate of descent
ft/min
480
640
800
960

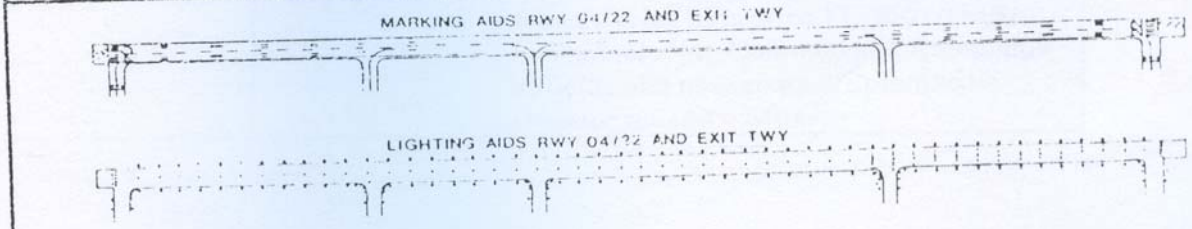

INSTRUMENT APPROACH CHART – ICAO
AERODROME ELEV. 29 ft
HEIGHTS RELATED TO THR RWY 04 – ELEV 24 ft
APP 118.1
TWR 118.7
KATUNAYAKE/BANDARANAIKE INTL:
VOR/DME ILS/DME
RWY 04
BEARINGS ARE MAGNETIC
ALTITUDES ELEVATIONS AND HEIGHTS IN FEET
MNM SECT ALT 2 500 25 NM
MNM SECT ALT 2 000 25 NM
MNM SECT ALT 3 500 25 NM
I.L.Z 109.9 IKW CH 36 X
VOR/DME 112.7 KAT CH 74 X 07°09.7'N 079°52.1'E
NDB /MKR 330 ASL 07°07.6'N 079°50.4'E
FAP 8.0 DME IKW/ILS 07°06.6'N 079°49.0'E
8.0 DME KAT
8.0 DME KAT
ELEVATIONS 2 500
HEIGHTS (2 476)
SCALE : 1 : 250 000
Km
NM
MISSED APPROACH
Continue on 041° R climbing to 1 500 and Contact Approach
8·0 DME
Transition Altitude 11 000
2 500 (2 476)
1 800 (1 676)
CAT A & B
CAT C & D
233°
239°
041°
FAP
OM
G.P. 3°
MAPT
ILS DME CO-LOCATED WITH G.P.
ILS IDH 63
ELEV 24
(THR RWY 04)
NM FROM GP/DME
OCA/H
Straight in Approach
Circling
Cat I
GP 3°
A
B
C
D
231(230)
244(220)
251(230)
264(240)
374(350)
FAP MAPT 5.2 NM
Rate of descent
kt
90
120
150
180
mins
1 28
2 36
2 05
1 44
ft/min
640
800
960

AIP SRI LANKA

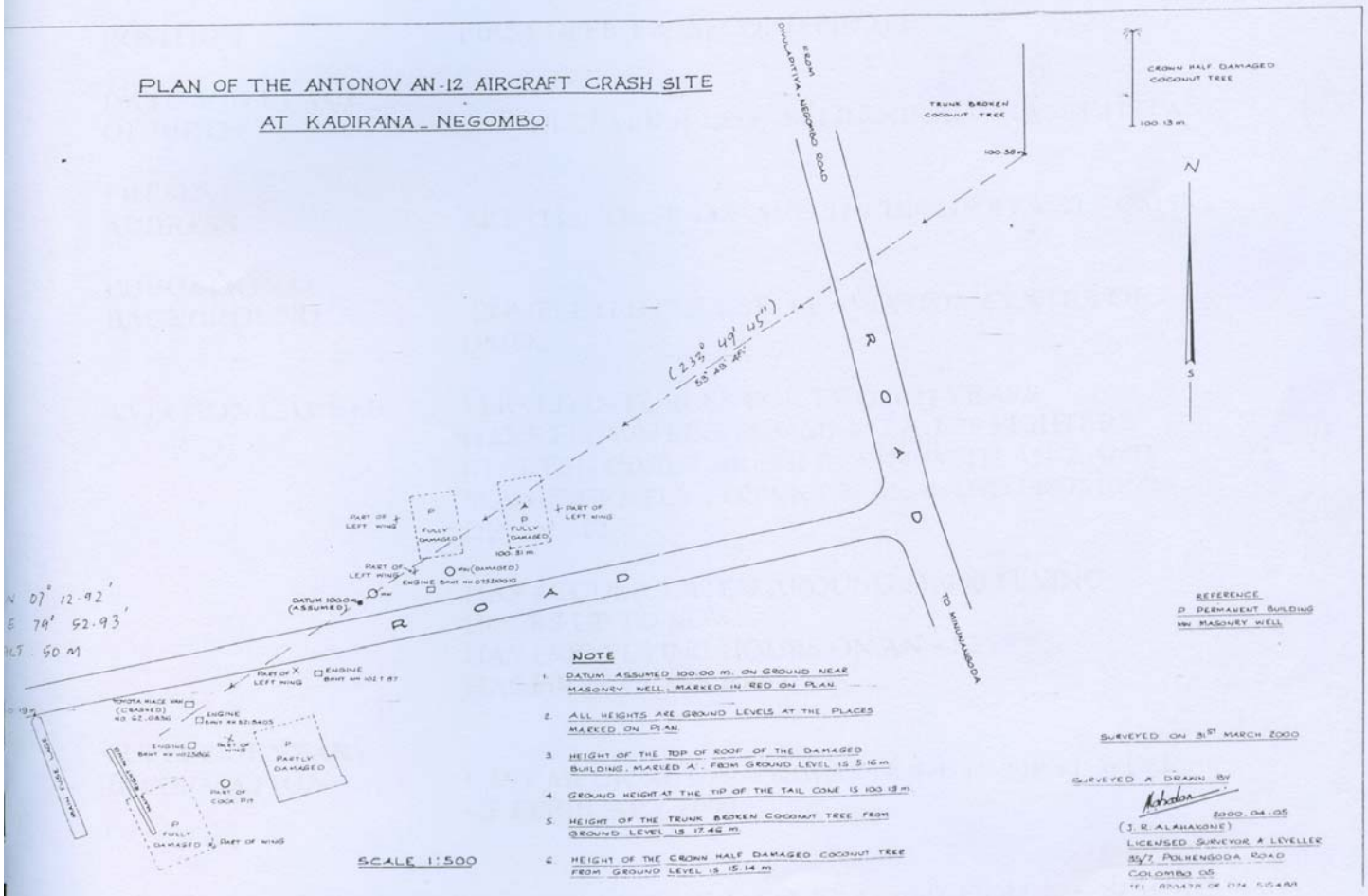
AERODROME CHART - ICAO 07° 10' 45"N 79° 52' 59"E ELEV 8·84m TWR 118·7 KATUNAYAKE / COLOMBO

RWY	DIRECTION	THR	BEARING STRENGTH
04	37°	07° 10·14'N 79° 52·35'E	PCN 85/F/B/X/T
22	217°	07° 11·57'N 79° 53 46'E	
APRONS			REFER AGA 2-1-11





17 OCT 91
NR 3


PLAN OF THE ANTONOV AN-12 AIRCRAFT CRASH SITE
AT KADIRANA - NEGOMBO
FROM DIVULAPITIYA - NEGOMBO ROAD
TRUNK BROKEN COCONUT TREE
100.38 m
CROWN HALF DAMAGED COCONUT TREE
100.13 m
N
S
(233° 49' 45")
55.28 M
ROAD
TO MINUWANGODA
P FULLY DAMAGED
P FULLY DAMAGED
100.31 m
PART OF LEFT WING
PART OF LEFT WING
ENGINE
DATUM 100.00 m (ASSUMED)
PART OF X LEFT WING
ENGINE
P PARTLY DAMAGED
PART OF COCK PIT
P FULLY DAMAGED
PART OF WING
SCALE 1:500
NOTE
1. DATUM ASSUMED 100.00 m. ON GROUND NEAR MASONRY WELL, MARKED IN RED ON PLAN.
2. ALL HEIGHTS ARE GROUND LEVELS AT THE PLACES MARKED ON PLAN.
3. HEIGHT OF THE TOP OF ROOF OF THE DAMAGED BUILDING, MARKED A, FROM GROUND LEVEL IS 5.16 m
4. GROUND HEIGHT AT THE TIP OF THE TAIL CONE IS 100.13 m
5. HEIGHT OF THE TRUNK BROKEN COCONUT TREE FROM GROUND LEVEL IS 17.46 m.
6. HEIGHT OF THE CROWN HALF DAMAGED COCONUT TREE FROM GROUND LEVEL IS 15.14 m
REFERENCE
P PERMANENT BUILDING
MW MASONRY WELL
SURVEYED ON 31ST MARCH 2000
SURVEYED & DRAWN BY
2000.04.05
(J. R. ALAHAKONE)
LICENSED SURVEYOR & LEVELLER
35/7 POLHENGODA ROAD
COLOMBO 05