AIR RESCUE

DR LESEGO BOGATSU AIR AMBULANCE REGULATIONS
SM:AVIATION MEDICAL MANADER SACAA


One-stop range
Non-stop range
Johannesburg
Lisbon
Algiers
Tunis
TUNISIA
Rabat
Tripoli
Athens
GREECE
TURKEY
Nicosia
CYPRUS
Beirut
LEBANON
SYRIA
Damascus
IRAQ
Baghdad
ISRAEL
Amman
JORDAN
Cairo
Tehran
Mashhad
Ashgabat
TURKMENISTAN
Dushanbe
TAJIKISTAN
Kabul
AFGHANISTAN
Islamabad
IRAN
MOROCCO
ALGERIA
LIBYA
EGYPT
KUWAIT
Kuwait
SAUDI
ARABIA
BAHRAIN
Manama
Riyadh
Doha
QATAR
Abu Dhabi
UNITED ARAB EMIRATES
OMAN
Muscat
PAKISTAN
NEPAL
BHUTAN
BANGLADESH
INDIA
Western Sahara
MAURITANIA
Nouakchott
MALI
NIGER
CHAD
SUDAN
Khartoum
ERITREA
Asmara
YEMEN
Sanaa
Dakar
SENEGAL
Banjul
THE GAMBIA
Bissau
GUINEA-BISSAU
GUINEA
Bamako
BURKINA FASO
Ouagadougou
Niamey
N'Djamena
DJIBOUTI
Djibouti
Conakry
Freetown
SIERRA LEONE
LIBERIA
Monrovia
BENIN
TOGO
GHANA
CÔTE D'IVOIRE
Yamoussoukro
Lomé
Accra
Porto-Novo
NIGERIA
Abuja
Addis Ababa
ETHIOPIA
SOMALIA
Colombo
SRI LANKA
MALDIVES
CAMEROON
CENTRAL AFRICAN REPUBLIC
SOUTH SUDAN
Juba
Bangui
Malabo
EQUATORIAL GUINEA
Yaounde
SAO TOME AND PRINCIPE
Libreville
GABON
REP. OF THE CONGO
Brazzaville
Kinshasa
DEMOCRATIC REPUBLIC OF THE CONGO
UGANDA
Kampala
KENYA
Nairobi
Mogadishu
RWANDA
Kigali
BURUNDI
Bujumbura
TANZANIA
Dar es Salaa
SEYCHELLES
Ascension (St. Helena)
St. Helena (St. Helena)
Luanda
ANGOLA
Lubumbashi
ZAMBIA
Lusaka
Lilongwe
MALAWI
COMOROS
Mayotte
Harare
ZIMBABWE
MOZAMBIQUE
Antananarivo
MADAGASCAR
Reunion
MAURITIUS
NAMIBIA
Windhoek
BOTSWANA
Gaborone
Pretoria
Maputo
Mbabane
ESWATINI
LESOTHO
Maseru
SOUTH AFRICA
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QATAR


G-MPAS
With you, we

Global Standards Working Group

Regulations

SACAA

SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Keeping you safe in the sky

health

Department:
Health
REPUBLIC OF SOUTH AFRICA

LUJO HAEMORAGIC OUTBREAK CASE STUDY AIR AMBULANCE

- Lujo haemorrhagic fever (LUHF)-Lusaka /Johannesburg 2008

- The outbreak began in Zambia when a person became sick after exposure to an infected rodent
- The patient sought care in a South African healthcare facility.

- There, four healthcare workers caring for the patient also became infected.

- Air Ambulance Staff -Four out of the five cases were fatal, this included the a cleaner at the hospital

What is needed for AA transport of HCP

- Local health authority release at the point of departure.
- Appropriate travel documentation and patient consent.
- Destination health authority acceptance of the patient.
- An appropriate safe means of transport with medical escorts and appropriate infection control/isolation measures in place.
- Landing approvals from the country concerned and over flight clearances from any country enroute.
- A confirmed receiving facility with adequate contact isolation.

HISTORY OF HEMS IN SA

Provider	Key Dates	Bases/Regions	Aircraft Used	Notes
Provincial HEMS	1970s–1990s	Major hospitals nationwide	Government-leased helicopters	Early government-led operations
	1977' - 1999	Flight for life (JHB, PTA) Aeromed (Durban)	BO105 / Bell Long Ranger	
MRI	1978–2000	JHB, Harrismith, Durban, Cape Town	4 helicopters (Bell long Rangers)	Ceased 2000
STAR	1999–2005	Gauteng, Tshwane, Polokwane, KZN, WC	Eurocopter EC-135, BO 105 LS	24/7 service, doctor + ALS paramedic
AMS/RCAMS	2000–present	Oudtshoorn, Durban, Richards Bay, CT, Polokwane	Not specified (daylight ops)	Non-profit, limited night ops in KZN
Netcare 911	2005–present	Gauteng, KZN, Eastern Cape, WC	EC-135, BO 105 LS, AS 350 B2, Bell 222 UT	24/7 in Gauteng, ICU-level equipment
ER24	2010 - 2017	JHB, Bloemfontein, Nelspruit, NW, Pietermaritzburg	Not specified (daylight ops)	5 helicopters, advanced medical care
ROCKET HEMS	2019–present	Independent, multiple bases	Bell 222UT / 230	NVG, high serviceability, ICU-level

(Muhlbauer, 2015)

Introduction

The Health Authorities in both referring and receiving countries need to accept the patient as this pose a potential threat to public health.

Patient nationality may be of impact, in that most health authorities will only consider acceptance of their own nationals.

Passenger may not be allowed if it is communicable disease case

Air space restrictions

C130 75 MEDICAL PATIENTS

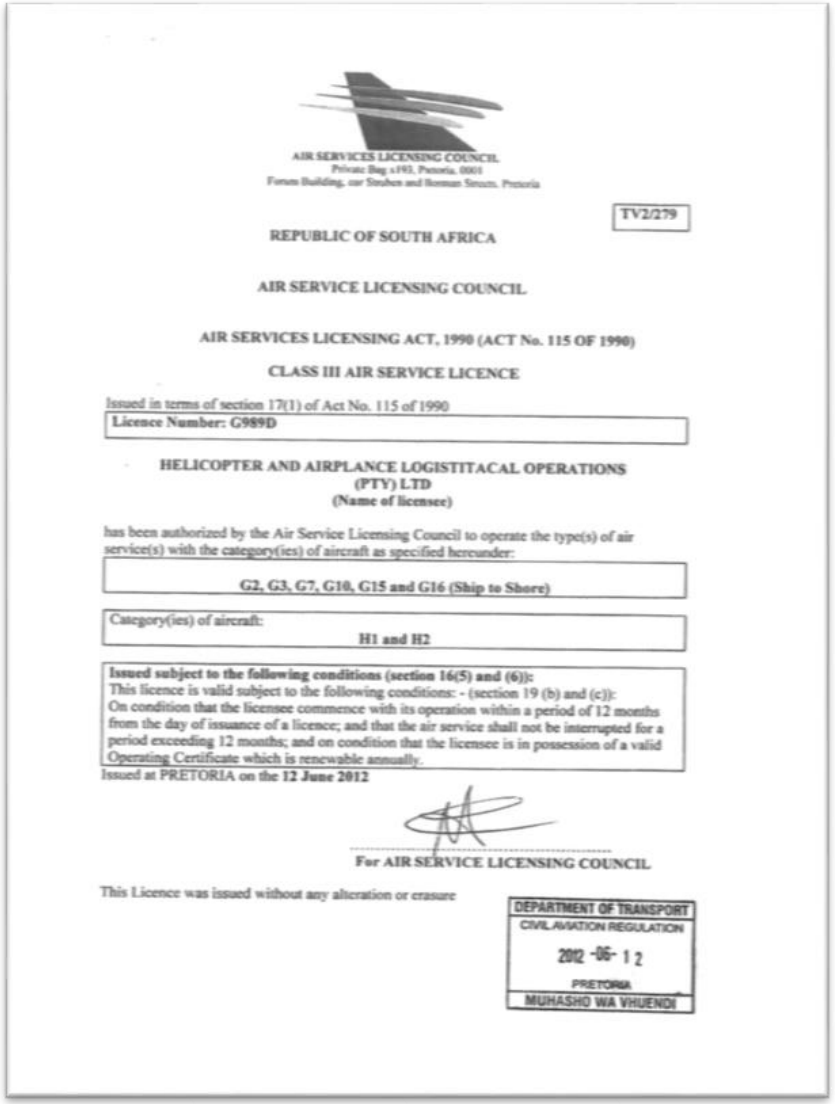
Air Service and International Air Service Definition

"Air Service" means any service operated by means of an aircraft for reward.

"International Air Service" means and air service which passes through the air space over the territory of the Republic and at least one other country.

CLASS III AIR SERVICE LICENCE

- Issued by the Air Services Licensing Council at the DoT
- In terms of the Air Services Licensing Act, Act of 1990, or the International Air Services Act, Act of 1993



AIR SERVICES LICENSING COUNCIL
Private Bag x193, Pretoria, 0001
Forum Building, cor Struben and Bosman Streets, Pretoria

TV2/279

REPUBLIC OF SOUTH AFRICA

AIR SERVICE LICENSING COUNCIL

AIR SERVICES LICENSING ACT, 1990 (ACT No. 115 OF 1990)

CLASS III AIR SERVICE LICENCE

Issued in terms of section 17(1) of Act No. 115 of 1990

Licence Number: G989D

HELICOPTER AND AIRPLANCE LOGISTITACAL OPERATIONS (PTY) LTD
(Name of licensee)

has been authorized by the Air Service Licensing Council to operate the type(s) of air service(s) with the category(ies) of aircraft as specified hereunder:

G2, G3, G7, G10, G15 and G16 (Ship to Shore)

Category(ies) of aircraft:
H1 and H2

Issued subject to the following conditions (section 16(5) and (6)):
This licence is valid subject to the following conditions: - (section 19 (b) and (c)):
On condition that the licensee commence with its operation within a period of 12 months from the day of issuance of a licence; and that the air service shall not be interrupted for a period exceeding 12 months; and on condition that the licensee is in possession of a valid Operating Certificate which is renewable annually.

Issued at PRETORIA on the **12 June 2012**

For AIR SERVICE LICENSING COUNCIL

This Licence was issued without any alteration or erasure

DEPARTMENT OF TRANSPORT
CIVIL AVIATION REGULATION
2012 -06- 12
PRETORIA
MUHASHO WA VHUENDI

SOUTH AFRICAN CIVIL AVIATION AUTHORITY

SEFAKO MAKGATHO HEALTH SCIENCES UNIVERSITY

OPERATIONS SPECIFICATIONS

These Operations Specifications forming part of the Operating Certificate are issued pursuant to Part 135 Subpart 6 of the Civil Aviation Regulations, of 2011, as amended.

ISSUING AUTHORITY CONTACT DETAILS.
Telephone: +27 11 545 1000: Fax: +27 11 545 1465 E-mail: mail@caa.co.za

AOC CERTIFICATE#: FO 14775
FLYING AMBULANCE (PTY) LTD t/a AEROCARE

Approved Air Services and Type of operations as applicable

Air Service	Class	License No	A/C Category	Types of Air Service
General Air Service	III	G179D	A3 / A4	G7
Domestic Non-Schedule	II	N178D	A3 /A4	*N1*

N1 – -Transport of passengers

G7 – emergency medical service including the provision of casualty equipment and medical personnel

Specific Approvals (limitations)

Dangerous Goods	Not Endorsed		Take off RVR	150 m		ETOPS	Not Endorsed
RVSM	Not Endorsed	Operational credits		A	N/A	Landing	See page 3
			SVS		x		
			HUD		x		
			EVS		x		
			Auto land		x		
			CVS		x		
Part 138	ZS-LFW, ZS-MDY, ZS-LRS, ZS-PLJ, ZS-PPZ, ZS-NXH		Navigation Specifications for PBN Operations			N/A	
EFB	Endorsed		Continued Airworthiness			AMO #: , Part 135 Subpart 9 King Air Services : 011 482 2197	

OPERATIONS SPECIFICATIONS APPROVAL

	SIPHAMANDLA B MHLANGA ACTING SM: FLIGHT OPERATIONS	04 NOVEMBER 2020
SIGNATURE	NAME IN BLOCK LETTERS	EFFECTIVE DATE
SENIOR MANAGER: FLIGHT OPERATIONS	CAA/FOD/OPSPECS0000008893	CAA/FOD/OPSPEC 0000008893

Number	Operator	Contact Details	Base(s)	Heli or Fixed Wing	Licence	Class	Type	Certificate	Expiry Date	Endorsement	CAR Part
1	Aerios Global Aviation	021 934 9127 & 082 453 0090	Cape Town Interbnational Airport	Helicopter	N1056D & G1057D	III	G7	AOC	12/31/2024	Part 138	Part 127
2	Aerocare	051 433 3197 & 072 332 2007	Bloemfontein Airport	Fixed wing	N179D	III	G7	AOC	11/30/2024	Part 138	Part 135
3	Air Ambulance Health Services	015 433 3197 & 072 332 2007	Bloemfontein Airport	Fixed wing	G1491D	III	G7	AOC	6/30/2024	Part 138	Part 135
4	Airwok Africa	012 543 0598 & 082 967 0440	Wonderboom Airport	Helicopter	N1162D & G1163D	III	G7	AOC	3/31/2024	New Applicant	Part 127
5	BalmOral Central Contracts SA	011 689 1005 and 082 769 7213	Lanseria International Airport, Lanseria	Fixed wing	G663D	III	G7	AOC	1/31/2025	Part 138	Part 135
6	Black Eagle Aviation Services	083 640 2500	Virginia Airport and Grand Central Airport	Helicopter	N1058D	III	G7	AOC	Part 127 - 31/03/2025 Part 135 - 31/08/2024	Part 138	Part 127
7	East London Air Services	043 736 1663 & 083 265 0912	East London Airport	Fixed wing	N640D & G736D	III	G7	AOC	3/31/2025	Part 138	Part 135
8	FIM Aviation	072 271 2555	Polokwane	Helicopter	G1344D	III	G7	AOC	2025/02/29	Part 138	Part 127
9	Flyfofa Airways	012 566 3019 & 072 678 3536	Wonderboom Airport	Fixed wing	N1173D	III	G7	AOC	No date Yet, still in progress	Part 138	Part 135
10	Gaurdian Air Asset Management	011 701 3011 & 073 203 5661	Lanseria Airport	Fixed wing	I/G284 & N1182D	III	G7	AOC	11/30/2024	Part 138	Part 135
11	HALO Aviation	086 111 6107 & 072 613 4616	Lanseria International Airport, Lanseria	Helicopter & Fixed	G989D	III	G7	AOC	Part 127 -	Part 138	Part 127

Air Ambulance Course –Civilian & Military

Mostly Mended by Paramedics (ILS/ALS) Medical Practitions /Professional Nurses

1) Specialists Depending on a case- Neonate on board
2) Proof of liability for Insurance
3) Each Operator has a 2 days Course –Operations

Part 127 Aircrafts &
Endorsement by the Medical
Department
Total 7

HELICOPTER AIR AMBULANCE

- Limited range slower speed
- Scene to hospital
- High cost / km
- Unpressurised
- Quick mobilization time (<8 minutes

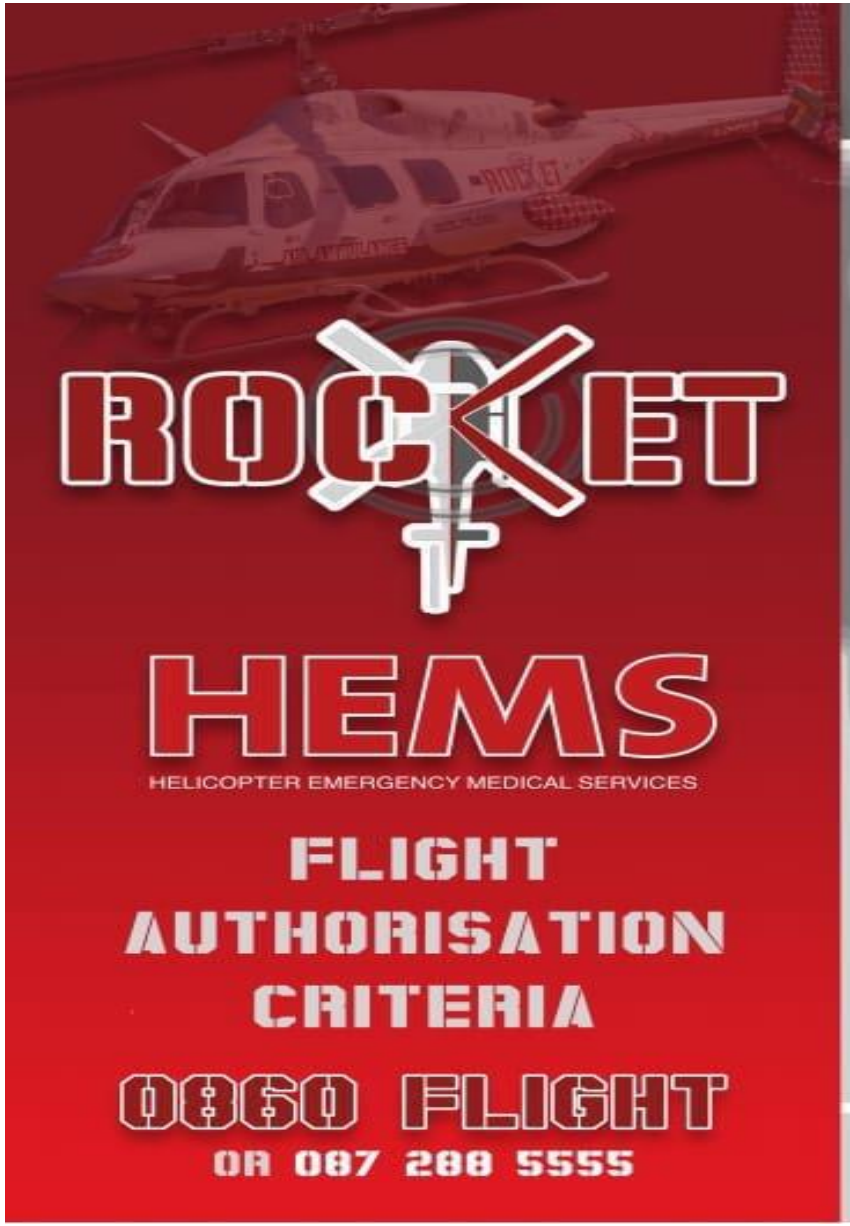
FACTORS INFLUENCING HEMS

- Cost(±r30 000-50 000/hr)
- Distance(fuel limitations)
- Weather(Visual Flight Rules
- Logistics fuel(strategic planning for fuel)
- Weather(preflight and ongoing planning)
- Duty hours(fdp)lz (unprepared vs prepared/ hazards)

SCENE PREPARATION HEMS

- FOR A SAFE LZ REMEMBER THE FOLLOWING. FOUR W'S AND FOUR S'S:

- FOUR W'S :WIND, WIRES, WAY IN WAY OUT.
- FOUR S'S :SIZE, SHAPE, SLOPE, SURFACE .



ROCKET

HEMS

HELICOPTER EMERGENCY MEDICAL SERVICES

FLIGHT AUTHORISATION CRITERIA

0860 FLIGHT

OR 087 288 5555

MEDICAL CALL-OUT CRITERIA

HEAD INJURIES with an initial GCS of between 5 and 12 out of 15, or with focal neurological deficit

STROKE PATIENTS where time to a stroke centre can be significantly reduced by air transport

HYPOTENSIVE PATIENTS with a systolic blood pressure of less than 80mmHg despite attempted haemorrhage control, fluid resuscitation and or inotropic support

RESPIRATORY DISTRESS despite oxygenation, where advanced airway management or mechanical ventilatory support is deemed necessary

SUSPECTED MYOCARDIAL INFARCTION OR UNSTABLE ARRYTHMIA where time to definitive care can be significantly reduced by air transport

NEAR DROWNING with haemodynamic compromise despite resuscitation attempts

OBSTETRIC / NEONATAL EMERGENCIES where specialist care is not immediately available

SUSPECTED SPINAL INJURY with or without neurological deficit, where transfer times by road are extended or terrain may prove detrimental to patient outcomes

THREATENED LIMBS with significant vascular compromise

PENETRATING TRAUMA to the head, neck, thorax and/or abdomen involving underlying organs or vascular structures

BURNS in adults with a BSA of 20-80% or in children with a BSA of 10% or more, or burns to the face, neck and chest with potential airway compromise

REFRACTORY ANAPHYLAXIS

ELECTROCUTION with unstable arrythmia or neurological deficit

HYPOTHERMIA < 35°C or HYPERTHERMIA > 40°C patients requiring advanced interventions and/or management, not immediately available

LIFE THREATENING MEDICAL CONDITIONS that require advanced interventions and/or management that is not immediately available

ANY SIGNIFICANT MEDICAL CONDITION where the expertise of medical flight crew is likely to benefit patient outcomes

SHOULD YOU, AT ANYTIME, BE UNSURE WHETHER OR NOT A PATIENT WILL BENEFIT FROM A MEDICAL FLIGHT PLEASE DO NOT HESITATE TO ESCALATE THE MATTER TO OUR DISPATCH CENTRE, WHERE WE WILL BE HAPPY TO ASSIST

TRANSPORT FLIGHT CRITERIA HEMS

- Primary Response
- To incident scene
- HEMS
- Interfacility Transfer (IFT)Hospital to hospital
- HEMS or FW depending on distance

CALL OUT / ACTIVATION CRITERIA

- flight criteria
- Specific skills required
- Taking specialist skills to the patient(surgeon_
- taking the patient to specialists kills(surgical
- rescue/ accessibility issues
- lack of skills/
- Consider Hearing Protection in Helicopter

- DEPLETIONOFAREARESOURCES

FLIGHT CREW TRAINING SAFETY ISSUES HOT LOADING

TRAINING BASED ON THE OPERATION –AIR CREW & MEDICAL CREW

SOUTH AFRICAN CIVIL AVIATION AUTHORITY

SEFAKO MAKGATHO HEALTH SCIENCES UNIVERSITY

PILOTS QUALIFICATIONS

I. Have a valid **CPL with night rating** appropriate to the category and type of air ambulance aircraft and the mission to be flown.

I. Received **training** (including thorough knowledge of the terrain)

II. Demonstrated minimum competency for the relevant mission to be flown, as prescribed in the manual of procedure

.

SOUTH AFRICAN CIVIL AVIATION AUTHORITY

SEFAKO MAKGATHO HEALTH SCIENCES UNIVERSITY

MEDICAL PERSONNEL

- Medical personnel and medical service providers involved in air ambulance operations shall comply with the relevant legislation and regulations administered by;

I. National Department of Health

II. Health Professions Council of South Africa (HPCSA) or

III. South African Nursing Council

SOUTH AFRICAN CIVIL AVIATION AUTHORITY

SEFAKO MAKGATHO HEALTH SCIENCES UNIVERSITY

Part 91 Aircrafts
Endorsement by the Medical Department
5 Helicopter & Fixed wing

SOUTH AFRICAN CIVIL AVIATION AUTHORITY

SEFAKO MAKGATHO HEALTH SCIENCES UNIVERSITY

Fixed Wing Air Ambulance

- Total 8
- Extended range and higher speed
- Airport to Airport
- Lower cost / km
- Pressurized (usually)
- Longer mobilization time (>1h usually
- Part 121 –Medical Department Endorsement

INFECTION CONTROL ISSUES

a. Control and Management of Communicable Diseases
b. Infection Control
c. Disposal of Hazardous Waste
d. Management and Control of Pharmaceutical Substances
e. Maintainance

Planning Transport with Communicable Disease

- Risk to medical and flight crew
- Careful logistical planning is required.
- Longer activation times needed.
- Impact of Altitude Stressors on a patient

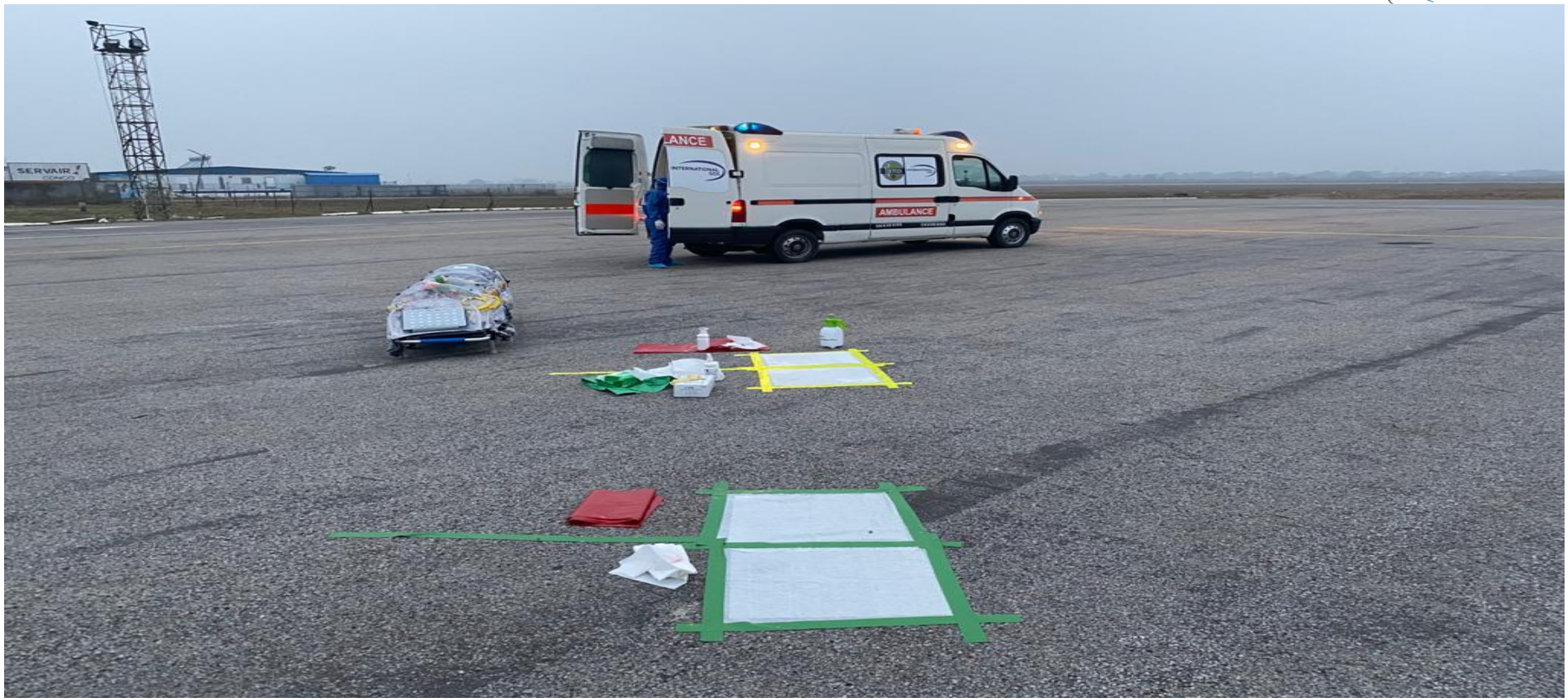
What is needed for AA transport of HCP

- Case must be accepted by the Air Ambulance Director

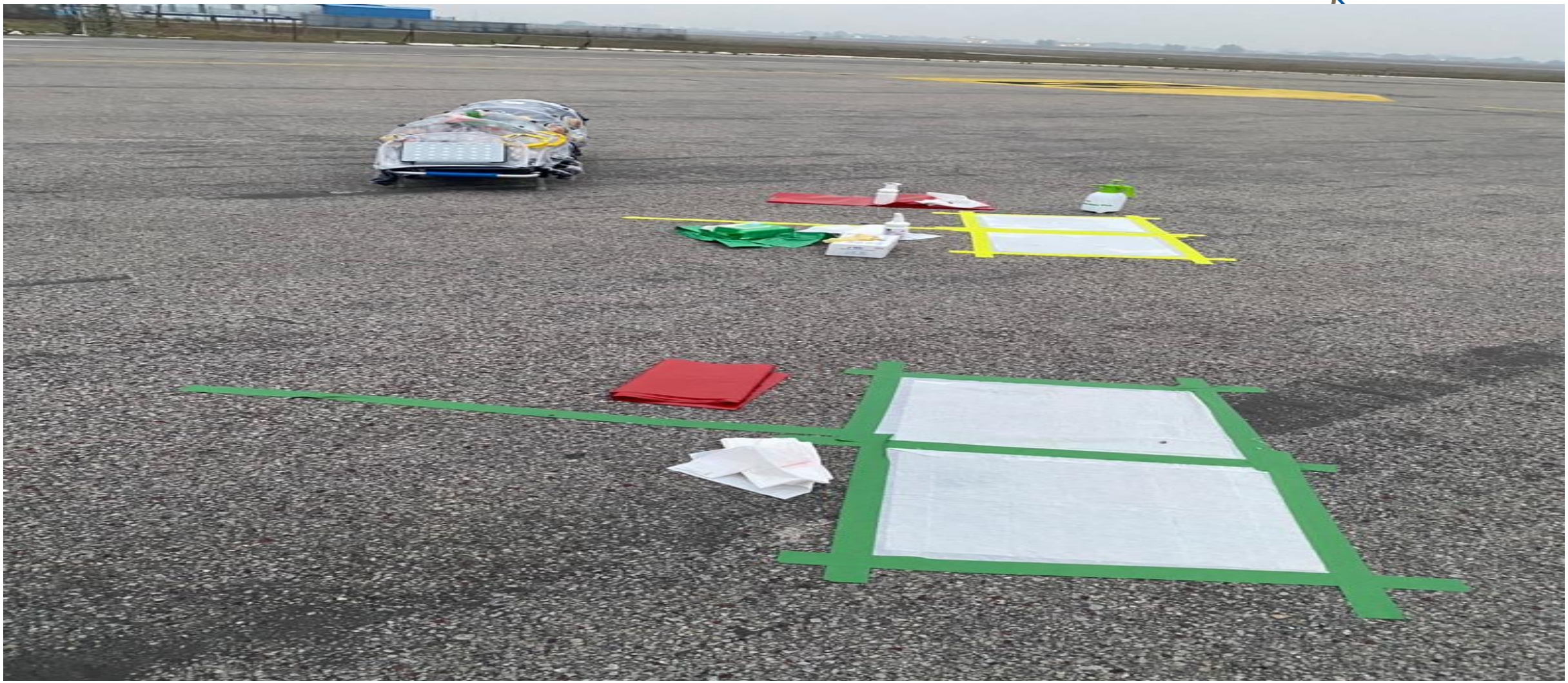
- Clinical Status of the passenger is considered-benefit from the trip or not

- Cost associated with the transfer a higher(Soak,PPE,additional crew
- Fight and ground crew trained on the manage case & mend the isolation unit
- Trained in PPE

Performing the mission Covid-19



LESSONS FROM COVID 19 TRAINING



Performing the mission

Portable Medical Isolation Units

- Origins - Air Transport Isolator, RAF
- SARS 2003
- 2015 – numerous PMIU's available
- Need bigger than a PMIU? ABCS / TIS – but more about that later...

http://www.raf.mod.uk/PMRAFNS/organisation/airtransportisolator.cfm

Portable Medical Isolation Units

Preparation

ANNEXURE A: PREPARATION OF ISOLATION UNIT IN STOREROOM PRIOR TO DEPARTURE

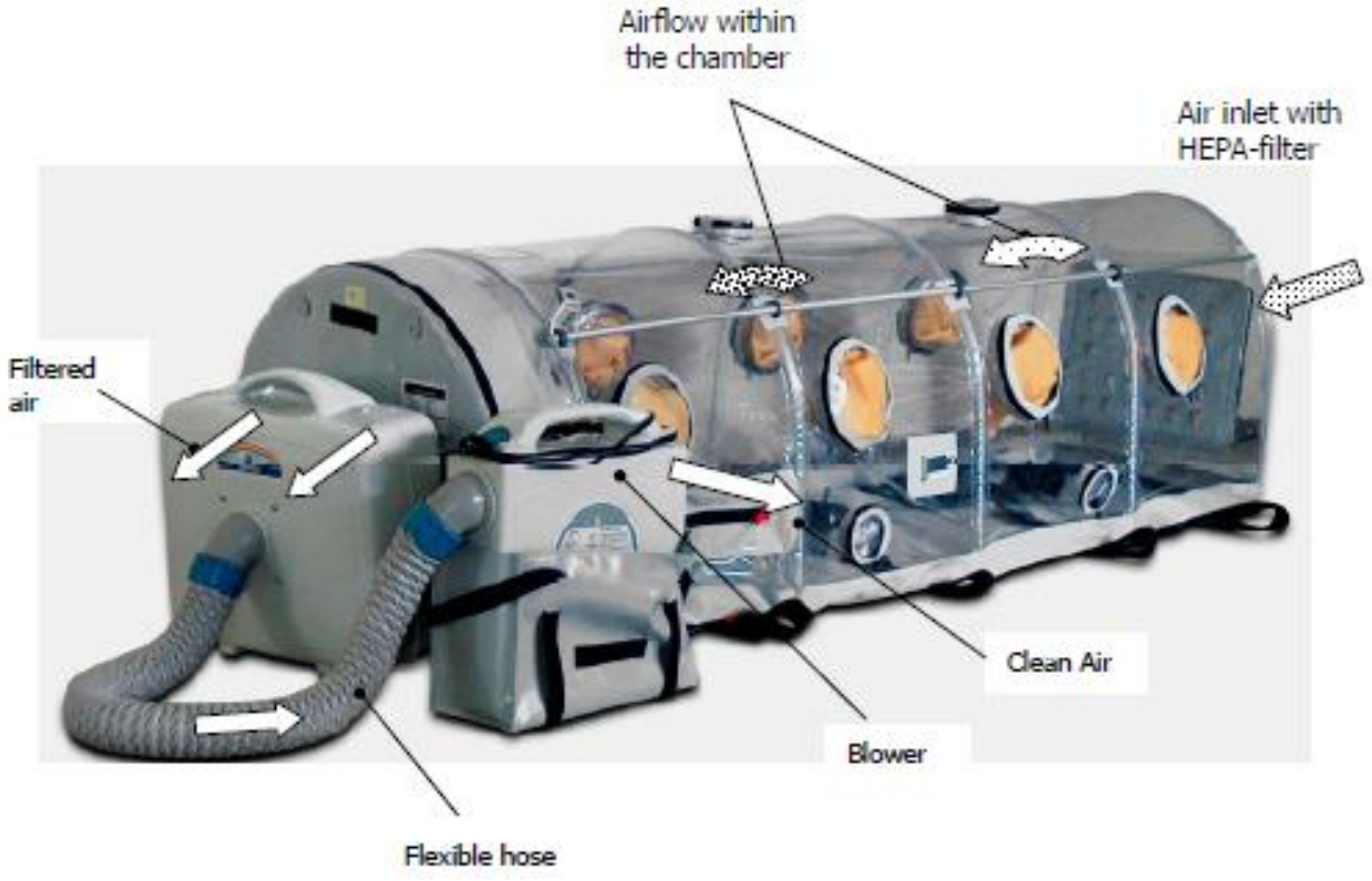
PREPARATION OF ISOLATION UNIT IN STOREROOM PRIOR TO DEPARTURE

BLUE BAG CONTENTS	QTY	Confirm taken
PMIU stretcher		
Disposable Flat sheets	2	
Pillow with plastic cover	1	
Pillow case	2	
Disposable blanket	1	
Cover pillow with 2 disposable pillow cases		
Secure PMIU to ZIP stretcher		
Connect PVC gloves to portholes, secure connection points with insolation tape		
Place buckles and straps from the PMIU in a zip seal bags and secure them with elastic bands		
Patient Monitoring		
Mobile SpO2 probe	1	
Disposable SpO2 probe	1	
SpO2 cable	1	
Zoll monitor blood pressure cable	1	
Blood pressure cuffs (Adult, Adult Long and Large Adult)	1 each	
Multifunction pads	2	
Re-breather mask	1	
Extra oxygen tubing - connect to oxygen flow meter and test that its working	2	
Thermometer for Zoll	1	
Prepare SpO2, BP and Multifunction pad cables, feed through portholes and secure		
Connect extra oxygen tubing to oxygen mask, feed through portholes and secure		
Patient Procedures		
Crystalloid pack (for IV insertion)	1	
3-way stop cock with extension	2	
Syringe driver connection tube (for line extension)	4	
Infusion pump lines	4	
Hep/saline flush for IV lines	2	
Infusion packs	2	
Balsol 1000mls	2	
Normal Saline 200mls	4	
Dextrose 50% 50mls	2	
Tourniquet	1	
Needles and syringes pack	1	
ABG set	1	

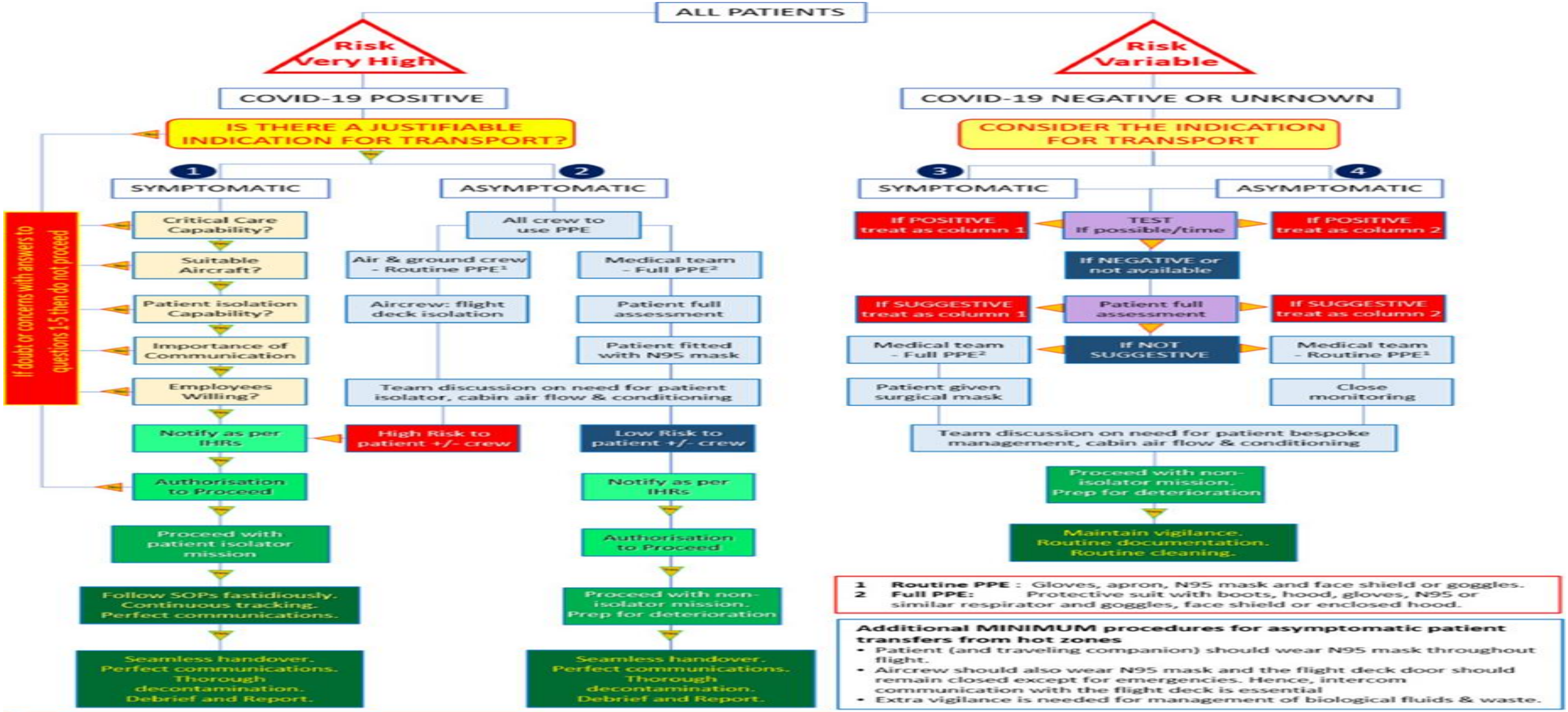
arps container	1	
theter pack	1	
epare infusion lines with extensions, prime line		
epare hep/saline flush, flush through 3 way stop-cocks		
r the Patient		
rge alchol wipes	20	
e jon	3	
k Jon	3	
per towels (for secretion control for the patient)	5	
rgical mask for the patient	5	
d bags	5	
lock bags (for patients passport)	5	
stic bands - to close Wee Jon if used	5	
ack pack for the patient	prn	
ergades and water	prn	
bles		
ttle cords	3	
ygen regulator	1	
in plug	1	
uipment		
l monitor	2	
usion pumps	2	
ringe driver	2	
ygen	prn	
ug "go bag"	prn	
her		
ng wrap - seal all isolation unit ports	1	
olation tape	3	
ct tape	3	
stic bands	20	
usion pump bracket	1	
usion pump IV arm	1	
ad lamps	2	
ve you sealed off all the ports / openings		
ce all extra bags in clear plastic bags		
olation unit contents		
amber	1	
rticle filter	1	
PA filter - ensure plastic cover is removed	1	
se	1	
wer	1	
nnect all parts to ensure unit is working		

Portable Medical Isolation Units

IsoArk N 36-4: Portable negative pressure isolation chamber



Beth-El Zikhron Yaaqov Industries. 2010. Technical Manual: IsoArk N 36-4



1 **Routine PPE** : Gloves, apron, N95 mask and face shield or goggles.
2 **Full PPE:** Protective suit with boots, hood, gloves, N95 or similar respirator and goggles, face shield or enclosed hood.

Additional MINIMUM procedures for asymptomatic patient transfers from hot zones

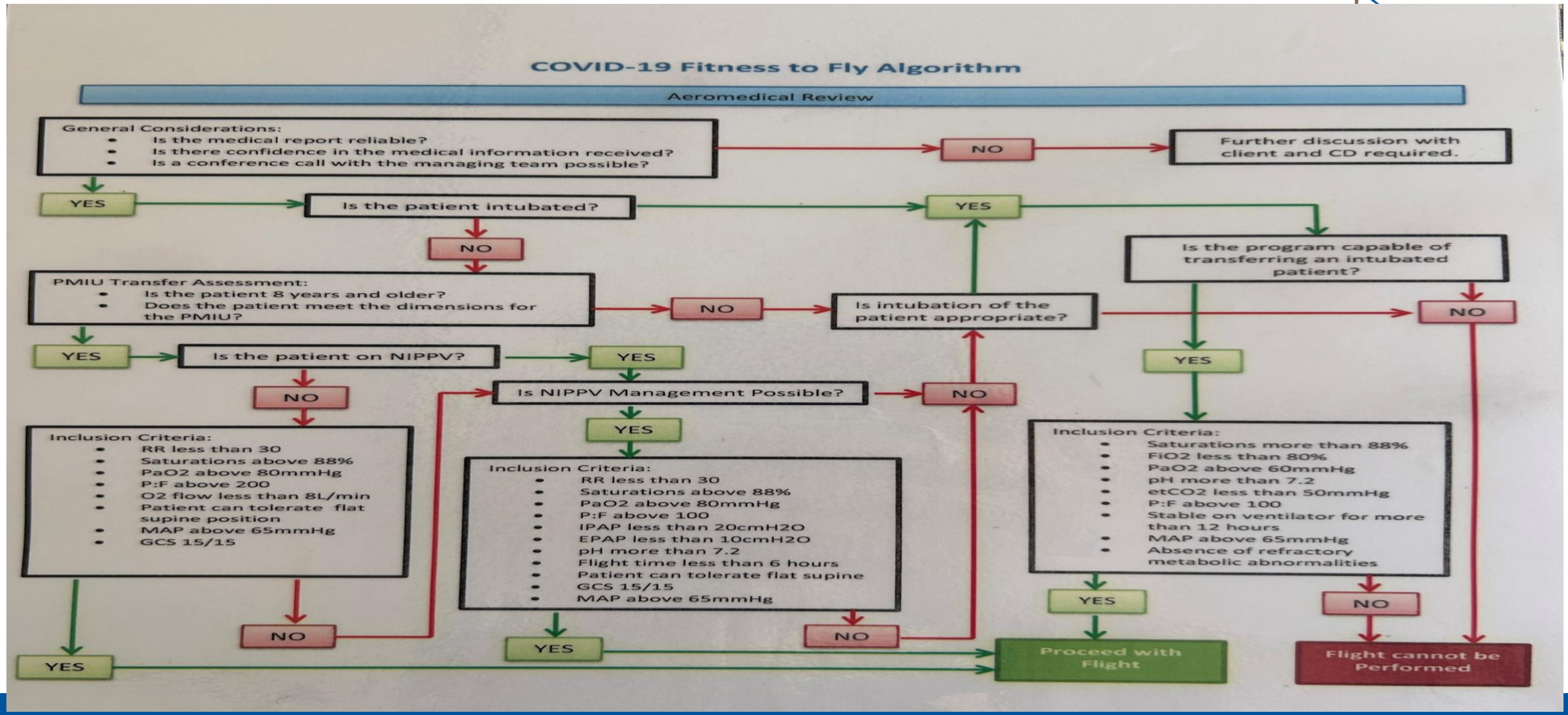
- Patient (and traveling companion) should wear N95 mask throughout flight.
- Aircrew should also wear N95 mask and the flight deck door should remain closed except for emergencies. Hence, intercom communication with the flight deck is essential
- Extra vigilance is needed for management of biological fluids & waste.

Suggested MINIMUM procedure for all transfers

- Medical team to wear 'routine' PPE (gloves, apron, N95 mask and face shield or goggles) throughout the entire patient contact time.
- On Pre-Flight Assessment: Check temperature, take recent medical history; check chronic health/other risk factors history. Ask specifically for respiratory tract and flu-like symptoms.
- Examine the chest. Check for dehydration and measure BP and oxygen saturation (stating FiO2). Look at the oropharynx.
- Review chest Xrays if available.
- Review recent blood results (especially for markers of infection).
- Review recent vital observations chart.
- Complete the remaining pre-flight assessment indicated for patient.
- If Covid-19 status unknown and time allows, test for Covid-19.
- Flight medical team to wear routine PPE for entire flight if the patient has no significant findings or history of Covid-19 infection.
- If the patient raises a high index of suspicion, he/she should be treated as a highly contagious patient.
- All patients to have routine TPR observations recorded once onboard the aircraft and hourly thereafter.
- Deterioration enroute should be documented and treated symptomatically. If indicated, the patient to wear N95 mask.

CCAT

Lessons from Covid 19



Lessons Learned ISOS Covid-19

- 58 International Medivacs
- 41 in the Isolation Unit
- 15 cases were ventilated

LOADING OF A PATIENT

Clinical considerations

- Fitness to transport in isolation unit.
- Limited interventions possible after patient in isolation unit.
- Limited access to patient during transport.
- Minimize high risk procedures.
- All ports for lines and leads sealed appropriately to minimize contamination risk.
- Patient comfort a challenge.

Operational & Logistic Considerations

- Countries with infectious cases involving their own citizens are generally more likely to favourably consider such requests.
- Willingness to accept patients of other nationalities is limited.
- Requirements from Authorities may not necessarily reflect scientific/medical fact – there *are* other issues to consider.

After the case Monitoring of Crew

The duration and method of surveillance will be determined by the Medical director and be based on:

- The Mode of transmission.
- The Level or exposure risk.
- The maximum duration of the Incubation Period.
- Symptoms of the disease.
- Vaccination status of the crew member, if applicable.
- Prophylaxis available, if applicable.
- Health Authority instructions or guidance.

COVID 19 Accident Netcare Accident 2021 5 Fatalities

Stretcher Approved by Airworthiness

-Adequate Entry to the door
-Restrained -approved by manufactured -
Compartment must be aligned by material non -
porous material –minize contamination

BUCHER

MBB-BK117 FLIGHT MANUAL SUPPLEMENT FMS 36/2

FOR

BUCHER AMBULANCE AND RESCUE SYSTEM (ARA)

ARA - BK117 - AC41 / STANDARD

FEDERAL OFFICE FOR CIVIL AVIATION APPROVED

EFFECTIVITY : AIRCRAFT SERIAL NO. 7250

AIRCRAFT REGISTRATION NO.

RELEASED BY : Federal Office for Civil Aviation Section for Type Certification

DATE : 10-11-99

This Flight Manual Supplement must be attached to the MBB-BK117 basic Rotorcraft Flight Manual when the aircraft is operated with the Ambulance and Rescue System installed

The equipment and installation has been certified for use in the MBB-BK117 by means of Supplemental Type Certificate Ref.No. Z25-20-59

The information contained herein supplements or supercedes the information contained in the basic Rotorcraft Flight Manual. For limitations, procedures and performance data not contained in this supplement refer to the basic Rotorcraft Flight Manual.

CIVIL AVIATION AUTHORITY

MODIFICATION APPROVAL CERTIFICATE

In terms of the

SOUTH AFRICAN CIVIL AVIATION REGULATIONS, 2011, AS AMENDED

Approval Number: M/20/048/S

This Modification Approval is issued by SACAA, acting in accordance with South African Civil Aviation Regulation Part 43.02.15: Modifications.

Name of Modification Holder	**MPT Maintenance (Pty) Ltd**
Physical Address of Holder	**Hangar 114, Gate 13, Lanseria International Airport, 1748**
Postal Address of Holder	**P.O. Box 45, Lanseria, 1748**

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified below:

Product Make and Model	**Beechcraft Corporation, 200**		
Registration Number of Aircraft	**ZS-BHK**	**Project Number**	**AO004435**
Product Serial Number	**BB-387**	**Affected TCDS No.**	**A24CE**

Description of Type Design Change:

Installation of Aero Medical Products Mfg., Inc. Air Ambulance Stretcher (P/N 125) using Installation Kit (P/N 805) in accordance with Installation and Operating Instructions, Form EA109K and per STC SA1129GL.

Certification Basis:

The Certification Basis for the original product remains applicable to this certificate/ approval.
The requirements for environmental protection and the associated certificated noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

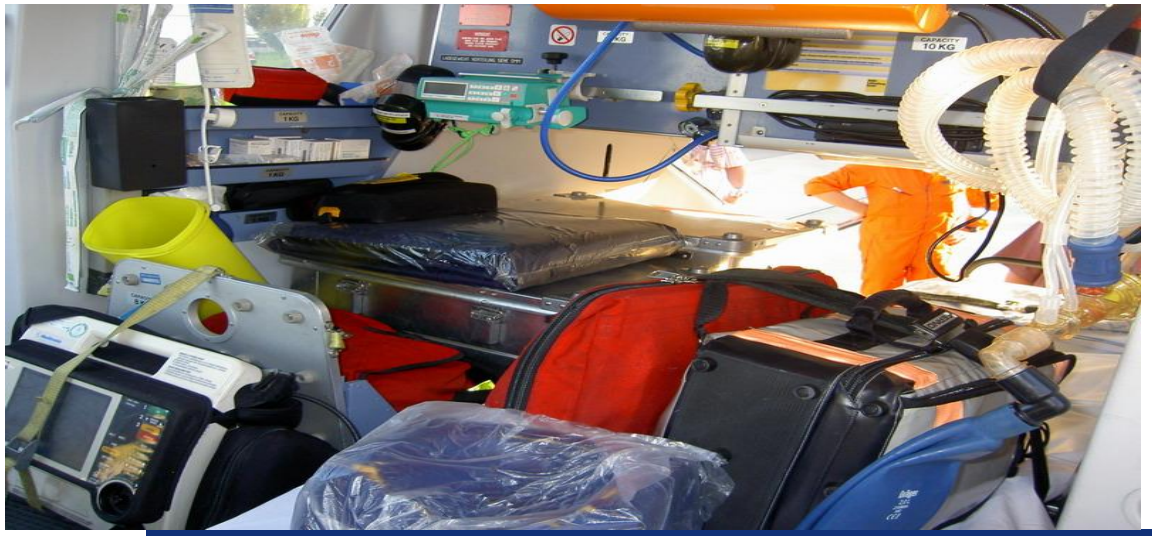
This Certificate and the supporting data, which is the basis for approval, shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Director of Civil Aviation.

2020 -02- 19	THANDI MOFOKENG Manufacturing / Production Inspector Civil Aviation Authority	FOR DIRECTOR OF CIVIL AVIATION
DATE OF ISSUE	**NAME IN BLOCK LETTERS**	**For: DIRECTOR OF CIVIL AVIATION**

AW NO: 01728

INSTRUMENTS AND EQUIPMENT CERTIFICATION FOR AVIATION & MAINTANANCE

Lighting inside the aircraft
Separation between Flight Crew & Medical Crew
Appropriate & Adequate Hooks/Hanging Devises for drips- must not cause injuries



WEIGHT & MASS BALANCE OXYGEN & DANGEROUS GOODS CONSIDERATION

/Hydrostatic Inspection – Department of Labour

Oxygen must be secured

Must not obstruct entry/emergency exits

Outlet marked in line with SANS

SOUTH AFRICAN CIVIL AVIATION AUTHORITY

SEFAKO MAKGATHO HEALTH SCIENCES UNIVERSITY

Management of Waste Material

Storage of medication must in line with local laws

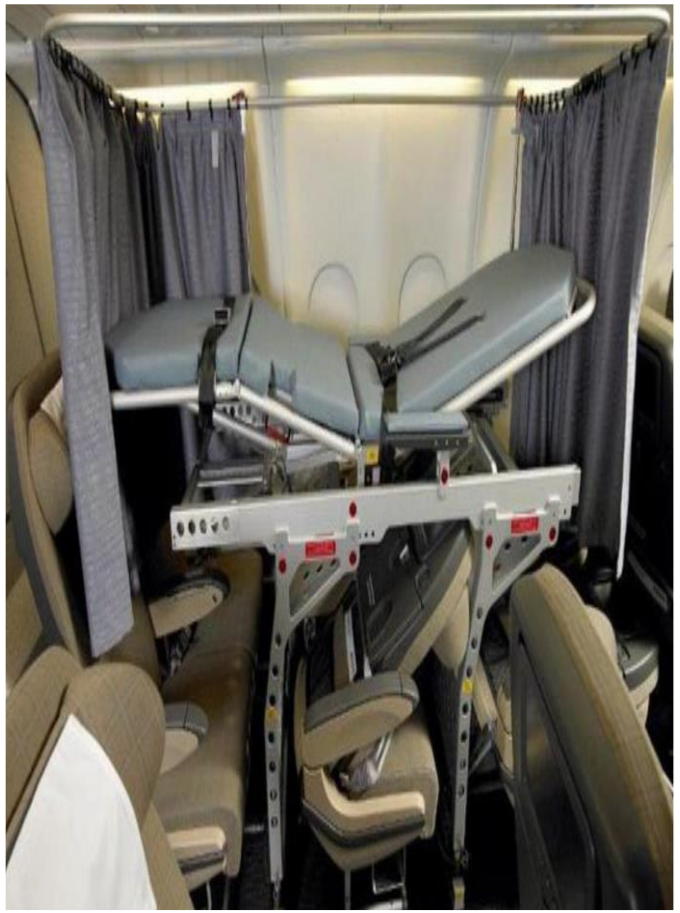
MAINTANANCE EQUIPMENT DOES NOT INTERFERE WITH AVIAONICS

SOUTH AFRICAN CIVIL AVIATION AUTHORITY

SEFAKO MAKGATHO HEALTH SCIENCES UNIVERSITY

ETT CUFF PRESSURE –ON THE GROUND

AEROMEDICAL TRANSPORT OPTIONS: COMMERCIAL AIRLINE TRANSPORT Part 91



COMMERCIAL AIRLINE / CHARTER TRANSPORT

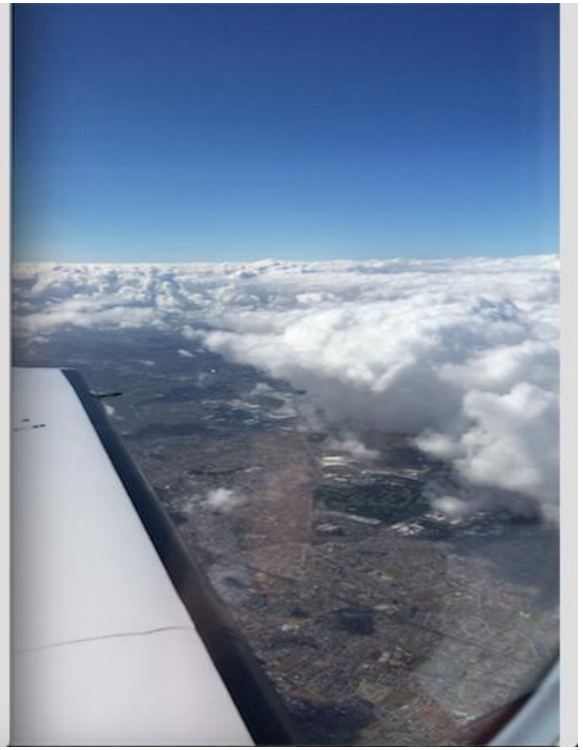
- Generally, for Minor medical conditions / repatriation
- Medical escort
- Minimal equipment
- By agreement with Airline / Operator

AEROMEDICAL TRANSPORT OPTIONS: COMMERCIAL TRANSPORT LUFTHANSA ICU POD=DURING COVID WERE REQUESTED TO

Operational & Logistic Considerations

- Authorisation of Health & Aviation Authorities is required
- Acceptance by authorities and adequate receiving facility can be difficult (or impossible) to achieve.
- Availability of isolation equipment/appropriate infection control and trained medical team is required – a limited resource.
  - Part 138 (SA-CAA) operator with capability
- Landing approvals from the country concerned and over fligl enroute can be challenging to secure.

HALFWAY THROUGH ASCENT (3770FT)



RESET AT CRUISING ALTITUDE (6470FT)

AIR RESCUE

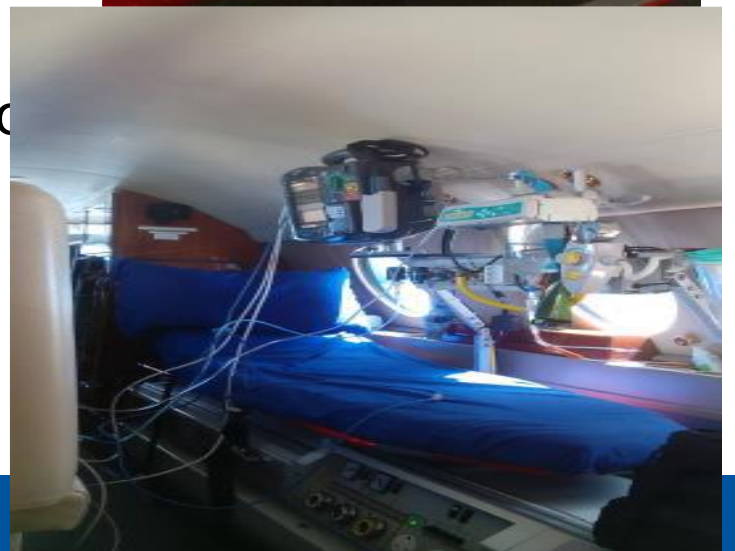

TRACOE
REF 720
pressure monitor
RUSCH
GPS1
PRAIM
Navigation
GEN1 28.4 91
GEN2 28.4 75
BAT1 28.4 0
BAT2 28.4 0
FAGG 850
CAB ALT 6470
5.62
CAB RATE 0
16

BENEFITS AIR AMBULANCE TRANSPORT

- Time to destination Time critical intervention eg Cath lab
- Mode of transport Terrain
- Unstable spinal injuries
- Special skills/equipment enroute Mobile ICU – high spec ventilator, ABG
- ECMO
- Distance Especially applicable to International

LIMITATIONS AIR AMBULANCE TRANSPORT

- Expensive & Weather dependent
- Limited patient access in flight dependent on aircraft
- Altitude effects on certain conditions Eg Bowel obstruction
- Long mobilization time for Fixed Wing (especially international flight)
- Stressors of flight affect patient and crew (vibration, turbulence, roto
  flicker, fuel smell, G force, hypoxia)
- Limited Service Providers



Management

- Quality Assurance
- Manual of Procedure
- Training Records

SOUTH AFRICAN CIVIL AVIATION AUTHORITY

SEFAKO MAKGATHO HEALTH SCIENCES UNIVERSITY

DISINFECTION OF THE AIRCRAFT PROCEDURE –Equipment/Aircraft Disinfected

AIR AMBULANCE TRANSPORTFLIGHT CRITERIA - IFT

- Time to life saving invasive intervention will be significantly shortened and as a direct result clinically meaningful.
- Patients with “highly critical” diagnoses (example acute epidural hematoma, life threatening intra-abdominal bleed where surgical capabilities exist at the current facility) may not be suitable candidates for inter-facility transfer.
- Delay in intervention—even if to facilitate a higher level of care—may come at the expense of clinical outcome.
- Neonates: Most neonates requiring intensive care will do well with ground EMS transfer.
- HEMS should only be considered for those neonates with time sensitive conditions or transfer from remote, rural facilities where clinical expertise is required for transfer.

AIR AMBULANCE TRANSPORTFLIGHT CRITERIA - IFT

- Cardiac arrest (medical or trauma)/ patient receiving CPR or peri-arrest & Distance and time to appropriate hospital should exceed 20km or 30 min.
- Adverse weather/ environmental conditions (at base, referring facility, enroute or receiving facility)
- Patient weight and size should be considered prior to take off.
- Accompanying equipment for patient care falls outside of the usual clinical or technical abilities of the HEMS.

AIR AMBULANCE TRANSPORTFLIGHT CRITERIA - IFT

- Long distance primary response where transport by road to a hospital for stabilisation is less than the flight time to scene.
- Search and rescue / terrain inaccessible & Mechanism of injury does not imply clinical condition severity.
- •Patient too unstable for transport duration (e.g. severe hypotension, hypoxia despite interventions), HACOR score ≥8 or futile regarding prognosis.
- •Active labour.

AIR AMBULANCE TRANSPORTFLIGHT CRITERIA - EXCLUSIONS

- Severe electrolyte imbalance.

- Large undrained pneumothorax or air in hollow organs or cranium at risk of expansion and adverse effects due to this tension (this is subject to change in altitude (not just in flight but also referral vs receiving site)) and may be considered if drainage can be established and/or altitude change minimal or mitigated.

- Patient or relative (if patient cannot consent) opposed to transfer.

Conclusion

- Planning is key
- Lots of stakeholders involved
- Dynamic approach needed
- Integrated with public health systems

AIR RESCUE