



**GOVERNMENT OF INDIA
OFFICE OF THE
DIRECTOR GENERAL OF CIVIL AVIATION
(AIR SAFETY DIRECTORATE)**

**AIR SAFETY CIRCULAR
No. 6 of 2010**

**ACTION REQUIRED OF
POLICE AUTHORITIES
IN CASE OF AIRCRAFT ACCIDENTS**

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(FILE NO. AV-15011/2/2010 -AS)

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The regulation regarding Notification, Investigation of aircraft accidents/incidents, removal or preservation of damaged aircraft involved in accidents/incidents, are duly covered under Rules 68 to 77(c) of Aircraft Rules,1937.

In almost every aircraft accident, the assistance of civil authorities, particularly that of local Police is necessary to ensure that vital evidence is not lost due to unnecessary tampering with the wreckage at the crash site. Even though the action required by civil authorities may vary in each individual case, broad outlines of procedure/action required is enumerated hereunder:-

1. NOTIFICATION:

On receipt of information regarding an aircraft accident away from a Civil or Military Airfield, the following action should be initiated by the Police authorities:-

- (i) Notify by the quickest possible means the Officer-Incharge of the nearest Civil/Military Aerodrome.
- (ii) Notify 'Duty Officer' of the nearest Flight Information Centre (FIC) situated at Delhi, Kolkata, Mumbai, Chennai Airports and Sub FIC at Guwahati Airport. This may be done through the Officer Incharge of the nearest Civil/Military Aerodrome, if direct telephone connections are not possible.

The telephone numbers of FICs of the regions are given below;

Delhi	:	011-25653457
Mumbai	:	022-26828222
Chennai	:	044-22561803
Kolkata	:	033-25112998) FIC colocated -25110517) with ACC W&E
Guwahati	:	0361-2842254) FIC colocated -2840256) with area & apron.

As far as possible, the notification should contain the following:-

- a) Registration marks of the aircraft: VT-SCB , 9N-AAR , N 9014 etc.
- b) Type of aircraft and number of engines.
- c) Name of the Pilot in Command and owner of the aircraft.

- d) Date, time and place where the accident/incident occurred.
- e) Number and description of persons killed/injured as a result of accident.
- f) The extent of known damage to the aircraft including fire, if any.

2. RESCUE OF PASSENGERS, CREW AND OTHERS:

- (i) Even prior to arrival of the Inspector of Accident or Officer In charge of the nearest Aerodrome/any Officer of the Civil Aviation Department, the Police authorities shall initiate action:-
 - a) to extricate persons from the aircraft.
 - b) to arrange for immediate First Aid and medical attention.
 - c) to extinguish fire and
 - d) assist the officers of the Civil Aviation Department on their arrival.
- ii) Whilst rescuing the injured crew members [Pilot and the Copilot(s)], their identification and location in or around the aircraft must be carefully observed and recorded.
- iii) In the event of Pilot and / or the Copilot(s) being found dead, the necessary photographs must be taken in situ prior to the removal. The removal action should be such as to cause minimum of disturbance to the aircraft wreckage/parts and any such disturbance should be fully recorded.
- iv) The location of the passengers alive or dead should be recorded immediately during rescue/removal operation. *However, removal of the injured to the nearest hospital must not be delayed for want of formalities with regard to the recording as stated above.*
- v) Removal of the person dead or alive from the wreckage is the responsibility of the Police/the Fire Fighting Services as in any other accident.

3. MEDICAL CHECK UP/POSTMORTEM EXAMINATION:

The Police authorities shall ensure that the Captain and the Copilot are immediately subjected to medical check up for consumption of alcohol. The doctor carrying out such a medical checkup shall take samples of blood, urine etc. required for detailed chemical analysis. In the event of an accident at an AAI Airport/Greenfield airport/Privately Managed Airport or any other airports, samples of blood, urine etc. should be taken at the AAI medical centre, wherever available. In other cases where medical centres are not available at the airports or when the condition of crew members requires immediate hospitalization, the Police authorities shall ensure that the samples of blood, urine etc. shall be taken at the nearest hospital. These checks should be expeditiously carried out without any loss of time. **The sample should be suitably preserved and handed over to the Inspector of Accidents for detailed laboratory examination.**

A. Crew Members (Dead)

- (i) In the event of death of the crew members, the Police authorities shall ensure that the bodies are subjected to detailed postmortem examination immediately to ascertain the

precise cause of death including the presence of extent of alcohol, drugs, carbon monoxide etc. in the system. The blood, urine and the viscera of the dead should be properly preserved by the doctor carrying out the postmortem examination for further detailed chemical analysis.

- (ii) The postmortem examination shall include among those mentioned in (i) above, other aspects such as physical incapacitation, if any, prior to the accident and precise cause of death etc. The postmortem examination shall be carried out in the format attached to this Circular. Wherever possible, a Specialist in Aviation Medicine shall also be associated with the postmortem examination. The postmortem report in the prescribed formats shall be handed over to the Inspector of Accidents/Investigator Incharge.

- (iii) Prior to subjecting the body of the crew member to post-mortem examination, its identity must be fully and properly established to the extent possible, full body photographed and its clothes and belongings recorded and preserved carefully in accordance with the police procedures.

B. Dead-Passengers:

All passengers on board the aircraft who received fatal injury would be subjected to post-mortem examination indicating the nature and extent of injury as well as cause of death with special reference to carbon mono-oxide. However, this requirement may be waived off by Inspector of Accident/Investigator Incharge of Civil Aviation Department Headquarters (Director of Air Safety) if the nature of accident so warrants.

4. RELEASE OF DEAD BODIES:

A. Crew

No bodies of the dead crew members specially of the pilot and the copilot are to be released even after the postmortem examination has been completed, by the Police authorities or any other authority. The Inspector of Accidents/the Investigator In charge/the Civil Aviation Department Headquarters (Director Air Safety) is the only authorized Officer(s) to issue instructions for the release of dead bodies of crew.

B. Passenger:

After the requirements of Para-3B have been complied with, the Police authorities may dispose of the dead bodies of passengers in accordance with their procedures and in consultation with Airlines/operator/owner (of the aircraft) concerned.

5. GUARDING OF THE WRECKAGE & PRESERVATION OF EVIDENCE:

- (i) The entire site of the crash area, including wreckage shall be immediately cordoned off and guarded by the Police till such time the investigation of the accident has been completed and positive instructions in writing issued to the Police authorities by the Inspector of Accidents/Investigator In charge or by DAS in the Office of the Director General of Civil Aviation.

(ii) The Police authorities arriving at the site of crash shall ensure that the public and other unauthorized persons are kept away from entering into the cordoned area and not allowed to interfere with the wreckage/parts of the aircraft or move around in the area which may obliterate the ground marks left by the aircraft which are of considerable value as a piece of evidence to the **Investigator**.

(iii) The parts of the wrecked aircraft shall not be disturbed or interfered with except for the purpose of providing succor to the injured, removal of dead bodies, extinguishing of fire and saving the wrecked parts.

6. EYE WITNESSES:

Police authorities shall record the names and addresses of all the eye witnesses and others who may have first hand knowledge of the accident and supply such a list to the Inspector of Accident/Investigator In charge on his arrival for the purpose of investigation and facilitate production of such witnesses before him. The copies of the statements of eye witnesses, if recorded may be handed over to the Inspector of Accident/Investigator-in-Charge.

7. GENERAL:

(i) On the arrival of the Inspector of Accident/Investigator-in-Charge at the crash site and his assuming responsibility, he shall be the final authority in all matters.

(ii) For the purpose of investigation under the Indian Aircraft Rules, 1937, it is imperative that Inspector of Accident/Investigator in-Charge appointed by the Director General of Civil Aviation has an unrestricted control over the aircraft-wreckage and the accident site. The Police authorities shall provide maximum assistance required by him in discharge of his duties. However, the Police authorities may carry out their functions in accordance with the Police procedures and other such formalities which they are required to fulfill under relevant rules in coordination with him without interfering with the smooth and efficient functioning of the **Inspector of Accident/Investigator-in-Charge**.

(iii) For offence under the Indian Aircraft Rules, 1937, the prosecutions are normally launched with the approval of and under instruction from the Government of India. Other offences may be dealt with by the Police in normal course of their duty.

8. PHOTOGRAPHY:

Photography may be carried out freely by the Police authorities and/or the Fire Fighting Authorities taking due care that no ground marks are obliterated and the aircraft wreckage/parts are not disturbed for this purpose. The Inspector of Accident / Investigator-Incharge may, however, take over this function on his arrival.

9. RESCUE BY FIRE FIGHTING SERVICE:

(i) During rescue operation, fire fighting services play a very important role. Whilst extricating the bodies from the wreckage alive or dead, the Officer-in-Charge supervising the operation shall ensure that minimum disturbance to the wreckage is caused while extricating such bodies and that he will keep adequate notes for the purpose to be passed on to the Inspector of Accident/Investigator-in-Charge conducting the investigation. Any movement of the controls/cutting of wires, cables etc. must be made note of for the purpose. If it is possible, free use of photography can be made prior to removal of such bodies. *However, where there is reasonable doubt to believe that the person to be extricated from the wreckage is still alive no delay should be caused in removal of that body.* In the

event of there being sufficient reasons to believe that body to be extricated is a dead one all possible care should be exercised as stated above.

(ii) Where the fire fighting services are not available and such rescue operations are being carried out by the Police authorities, the Police Officer-Incharge of the operation shall ensure that the above instructions with regard to fire fighting and rescue operations are complied with.

This supersedes Air Safety Circular No.3 of 1984.

(B.S. RAI)
Director Air Safety
For Director General of Civil Aviation

New Delhi
Dated 15th December, 2010

REQUIREMENTS OF AIRCRAFT ACCIDENT INVESTIGATION

POST MORTEM REPORT
(As per Air Safety Circular No.6 of 2010)

1. SURNAME

2. FIRST NAME

3. CREW DUTY
(Or PASSENGER SEATING)

4. AGE

5. SEX

6. HEIGHT

7. PHYSIQUE

8. NUTRITION

9. SPECIAL IDENTIFYING FEATURES/MARKS

10. DATE AND TIME OF RECEIPT OF BODY

11. DATE & TIME OF RECEIPT OF INQUEST PAPERS

12. DATE & TIME OF DEATH

13. DATE & TIME OF AUTOPSY

14. CASUALTY SURVIVED

(.....mins/hrs/days following injury or incident)

Note: Applicable findings from para-15 onwards are to be marked out by a Ring

15. CONDITIONS OF BODY AT AUTOPSY

(a) Preserved, Dismembered
1 limb, Dismembered 2 limbs.

De-capacitated, Disintegrated

Incinerated.

(b) Good condition. Early post mortem

Changes. Advanced post mortem

Changes, Putrefaction.

16. CONDITIONS IN WHICH BODY WAS FOUND:

Clothed, Partially Clothed, Unclothed,

Not known; Cold; Moderate Temperature

Hot. Land. Fresh Water, Sea Water

17. ANY OTHER REMARKS

(SPECIFY)

- NOTE:
1. For Autopsy Guide, see Appendix 'A'
 2. Instructions for collection, preservation, storage and dispatch of specimen, see Appendix 'B'

INTERNAL EXAMINATION

18. BRAIN.. .. Normal
Any pre-existing lesion.
Weight... .. Congestion

19. SPINAL CORD accident.....	Normal. Not examined. Any pre-existing lesion: Damage sustained in
20. MIDDLE EAR	Normal. Not examined, Unilateral haemorrhage Rt/Lt Bilateral Haemorrhage
21. GLOTTIS	Normal Congestion. Petechiae. Haemorrhage. Fracture of Cartilage (Specify)
22. PLEURAL SPACE Rt/Lt.	Normal. Any pre-existing lesion. Rt/Lt; Pneumothorax Bilateral Hydrothorax.... Ccs Rt.....ccs --Lt. Haemothoraxccs Rt.....ccs.....Lt. Petechia present on pleural surface or lungs
23. TRACHEA	Normal. Injured in accident (specify). Contains vomitus/blood/other (specify): Evidence of aute mortem burning:
24. LUNGS	
(a) RIGHT	Normal. Any pre-existing lesion.
Weight in.....lobes.lobes; lobes.	Mottling with/without rib markings Oedema/ haemorrhagic oedemaof.....degree Traumatic emphysema present in Collapse of. Degree in
	Rupture/laceration (specify location and cause) Any evidence of drowning.
(b) LEFT	Normal. Any pre-existing lesion.
Weight in.....lobes.	Mottling with/without rib markings Oedema/ haemorrhagic oedemaof.....degree Traumatic emphysema present in

.....lobes;
lobes.

Collapse of. Degree in

Rupture/laceration (specify location and cause)
Any evidence of drowning

25. PERICARDIUM

Normal;
Any pre-existing lesion:
Petechiae present on visceral surface:
Bruising of degree
Haemopericardium ofccs;
Hydropericardium ofccs;
Lacerations atwith heart in situ/displaced to

26. HEART

Weight

Normal;
Any pre-existing lesion:
Foramen ovale closed/patent
Endocardial rupture at ...
Penetrating wound of ..degree caused by ..involving
Full thickness rupture at

27. CORONARY ARTERIES

Normal Atheroma with adequate lumen;
Atheroma with severe restriction of lumen;
Artheroma with degenerative changes;
Short description of coronary circulation if abnormal.

28. AORTA

Normal.
Any pre-existing lesion,
Trauma involving.....

29 OTHER GREAT VESSELS:

Normal.
Any pre-existing lesion;
Trauma involving.....

30. DIAPHRAGM

Normal;
Bruising, Rupture Rt/Lt;
Bilateral Herniation of viscera
(specify)

31. PERITONEUM

Normal;
Any pre-existing lesion:
Retromesenteric haemorrhage of

	degree;
		Haemoperitoneum ofccs.
		Hydroperitoneum ofccs.
		Laceration of peritoneum at.....
32. OESOPHAGUS		Normal
		Any pre-existing lesion:
		Contains stomach content.
		Evidence of ante mortem burning.
		Injured in accident (specify)
33. STOMACH		Normal.
		Any pre-existing lesion:
		Distension Rupture into abdomen/thorax
34. INTESTINES		Normal.
		Any pre-existing lesion:
		Distension, Rupture at:
		Haemorrhage of wall/into lumen of ... degree
		involving.....
35. LIVER		Normal.
		Any pre-existing lesion.
	Weight	Trauma ofdegreecaused
	by.....	
36. SPLEEN		Normal Any pre-existing lesion.
	Weight	Trauma ofdegree caused by.....
37. PANCREAS		Normal
		Any pre-existing lesion:
	Weight	Trauma ofdegree caused
	by.....	
38. KIDNEY		
	(a) RIGHT	Normal
		Any pre-existing lesion.
	Weight	Rupture/laceration ofdegree caused by.....
		Perirenal haemorrhage ofdegree.
		Intrarenal haemorrhage ofdegree.
	(b) LEFT	Normal.
		Any pre-existing lesion:
	Weight	Rupture/laceration ofdegree caused by.....
		Perirenal haemorrhage ofdegree.
		Intrarenal haemorrhage ofdegree.
39. ADRENAL : (a) RIGHT		Normal
		Any pre-existing lesion.

	Weight	Laceration ofdegree	caused
	by.....	Periglandular haemorrhage ofdegree. Intraglandular haemorrhage ofdegree.	
	(b) Left	Normal. Any pre-existing lesion.	
	Weight	Laceration of degree caused by Periglandular haemorrhage ofdegree. Intraglandular haemorrhage of degree.	
40.	PELVIC ORGANS	Normal Any pre-existing lesion. Damaged in accident (specify) In association with (Any bony injury)	
41.	PITUITARY	Normal. Not examined Any pre-existing lesion. Haemorrhage ofdegree.	
42.	THYMUS	Normal. Enlarged.	
	Weight	Haemorrhage ofdegree.	
43.	THYROID	Normal Any pre-existing lesion.	
	Weight	Any traumatic changes.	
44.	LYMPH GLANDS	Normal Any pre-existing lesion.	
45.	AIR EMBOLISM	No evidence. Found atSignificance.	
46.	FAT EMBOLISM	No gross evidence. Evidence found (Specify)	
47.	CARBON MONOXIDE POISONING	No evidence. Autopsy evidence. Estimated atlaboratory -- %	
48.	OTHER POISONINGS	No evidence. Autopsy evidence (specify) Presence confirmed atLaboratory Specify type:	
49.	ANOXIA	No evidence. Autopsy evidence (specify)	
50.	OTHER CONDITIONS	Summarise any other Abnormalities discovered which are not covered in the reminder of the report.	
51.	CAUSATION OF INJURIES		

Summarise the major injuries sustained by cause

(a) Ante mortem:

- (i) In aircraft in air.
- (ii) At altitude while escaping.
- (iii) On ground following escape.
- (iv) In aircraft at ground impact.
- (v) While being thrown from aircraft at impact.
- (vi) On spontaneous ejection.
- (vii) Other cause (specify).

(b) Post mortem:

- (i) In aircraft in air.
- (ii) At altitude while escaping.
- (iii) On ground following escape.
- (iv) In aircraft at ground impact.
- (v) While being thrown from aircraft at impact.
- (vi) On spontaneous ejection.
- (vii) Other cause (specify):

52. PRE-EXISTING DISEASE:

Summarise any physical condition discovered which may have contributed to pilot error or incapability

53. Specimen for histological examination:

1. Brain

- (a) Cerebrum Coronal section
- (b) Cerebellum Coronal section
- (c) Mid brain including medulla oblongata

2. Pituitary gland

3. Thyroid Gland

4. Respiratory tract:
 - (a) Piece of Trachea ---- May be sent whole in cases of bodies associated with burns
 - (b) Piece of Bonchi --- May be sent whole in cases of bodies associated with burns
 - (c) Pieces from each lobe of both the lungs
(Total : 5 pieces)
 5. Heart and Aorta:
 - (a) Piece of Aorta
 - (b) Heart as a whole.
 6. Any enlarged or suspicious lymphnodes from the neck or thorax.
 7. Abdomen:
 - (a) Piece from stomach.
 - (b) Piece each from small & large intestines.
 - (c) Liver.
 - (d) Each Kidney.
 - (e) Each suprarenal.
 - (f) Pancreas.
 - (g) Spleen.
 8. Skin
- N.B. The specimen of any of above tissues if not collected, the reasons thereof be indicated against it.

54. *Specimens for Biochemical Toxicological Examination:*

- (1) Brain/Blood for Lactic Acid Estimation.
- (2) Blood/Urine for ethanol (Ethyl Alcohol)
- (3) Blood/Muscle for carbon mono-oxide.
- (4) Urine/Gastric contents/tissues for Drugs.

N.B. For detailed instructions, regarding containers, preservation, preservatives, storage, dispatch labeling etc. of items 48 and 54 reference should be made to

Appendix "B".

55. Cause of Death:

Disease or condition directly leading to death (a).

Antecedent due to or as a consequence of (b).

Causes due to or as a consequence of (c).

Other significant conditions:

56. Signature of Pathologist:

Name in capitals

Appointment

AUTOPSY GUIDE FOR MEDICAL OFFICERS – FATAL AIRCRAFT ACCIDENTS
INVESTIGATIONS

I. *General:*

The aims of conducting a post-mortem examination on all fatalities in aircraft accidents are:-

1. To evaluate the effect of environmental stress of flight on the individual.
2. To establish the causative agent for:
 - (a) The crash
 - (b) The injuries, so that,
 - (i) sequence of events in relation to the presence of antemortem and post-mortem injuries may be reconstructed and,
 - (ii) the use and abuse of safety equipment may be evaluated.
3. To ascertain the presence of pre-existing disease/factor which might have incapacitated the individual and contributed to accident causation.

The autopsy should be as complete and thorough as circumstances permit, irrespective of scantiness of material, putrefaction, gross mutilation and disfigurement due to burning.

II. *Examination of clothing and personal equipment:*

Before autopsy, the body should be examined with all clothing on, for a careful assessment of the clothing worn, damage to clothing per se, as well as in relation to underlying, injury, presence of burns, foreign bodies etc. should be noted. Photographic record of important findings must be made.

After removal of clothing, X-rays of part of whole body, (only in selected cases) may be taken to determine the site nature and number of obscure fractures and metallic foreign bodies in the skin. All wounds, contusions and external injuries should be carefully noted. Photographs should be taken of both the dorsal and ventral sides of the body to have a record of external findings.

A suitable plastic or paper bag is labeled and provided for each victim so that all personal effects, clothing, shoes and other items after examination are placed in the bag, sealed and subsequently handed over to the appropriate authority.

III. *Examination of the body:*

It is advisable to make a set plan for carrying out autopsy so that no findings in the body are missed. A useful method is by recording the findings starting from head and going down to the foot.

1. *External Examination:-* Although the size and location of injuries, description of abrasions, imprints of harness straps' inner clothing etc. are important and should be noted in all cases, one need not, however, be over fastidious regarding the minute accuracy of their measurements. When some 'specific injury' marks are present, they should be accurately measured and drawn on a paper for subsequent correlation with aircraft parts which may have caused the "specific injury"

2. *Internal Examination:-* The technique of performing autopsy viz. body incision, opening of skull, removal of internal organs etc. is the same as for any clinical/forensic autopsy.

(a) *Head and Face:*

- (i) All fractures injuries and pre-existing disease in the brain, meninges and face are to be recorded. Presence of cerebral aneurysm should always be especially looked for.

- (ii) Special care is required while removing skull cap so as not to cause any damage which may be mistaken of ante-mortem injuries.

- (iii) Ante-mortem subconjunctival haemorrhages should be looked for.

- (iv) Fractures around Foramen Magnum should always be noted.

- (v) In case of burns-splitting of skin, explosive fractures of skull bones and even a cooked up haematoma in the middle cranial fossa may be encountered which are quite commonly due to post-mortem fire effects. They should be interpreted with due care.

(b) *Neck and Thorax :*

- (i) Vertebral and rib fractures should be noted carefully with special emphasis on the direction and type of fracture. Correlation of rib fractures should be made with underlying injuries to various organs e.g. heart and lungs, with a view to differentiate between those induced by fractured ribs and those caused by decelerative trauma.

- and hyperflexion of
- (ii) Fracture of sternum especially at its posterior aspect – all the level of 2nd, 3rd and 4th ribs should be looked for as it gives an indication of severe the body.
- Pathologist is
- (iii) Posterior rupture of the heart should be looked for. Heart should be removed as a whole and sent for detailed histological examinations. If the experienced, he can open coronary arteries and look for lesions. The heart chambers should be opened along the right and left borders of the heart to ensure proper fixing of tissues by the preservative. Septal defects, old scars or any other suspicious finding should be carefully noted.
- are left
- (iv) If there is laceration of aorta, it must be ascertained whether this is due to fractured ribs or decelerative forces. In the latter event, the laceration characteristically located in the ascending aorta, or just distal to the subclavian artery.
- Tracheobronchial
- (v) 80 to 85% of accidents are associated with fire. Larynx and tree should be carefully dissected and foreign bodies, soot or carbon particles within the airways should be searched for. Characteristics and colour of lining mucosa of the airways including the larynx should be noted.
- (vi) Pieces of lungs should be preserved for histological studies.
- (vii) Blood and froth in respiratory airways are indicative of asphyxia or survival after lung trauma and should be looked for.
- (viii) Oedema of larynx and severe inflammation of tracheal mucosa may be as a result of inhalation of very toxic fire fumes and should be carefully observed.
- (c) *Abdomen:*
- contusion
- (i) Injuries to all viscera should be noted. Presence of tear and bruising of mesentery is very important and must be looked for. This along with of bowel walls may indicate lap-belt injuries.
- fractured ribs.
- (ii) It should be determined whether liver injuries are due to fractured ribs, crushing/decelerative forces or penetrating objects other than
- mortem
- (iii) Stomach should be examined for injuries, pre-existing disease and post-auto-digestive changes such as ulceration.
- (iv) Rupture of diaphragm should be especially looked for.
- (v) Kidneys should be noted for any pre-existing pathology or injuries.
- (d) *Vertebral Column:*

of noted and injuries clothing. lacerations over

- (i) All fractures/dislocations should be noted especially from the point of view determining the directive forces. Exact location of injury should be confirmed by X-ray examination if required.
- (ii) Pelvis should be examined in detail. Dislocation of symphysis pubis and to groin, scrotum and testes should be correlated with damage to the Fractures of ischeal tuberosity should be correlated with buttocks.

(e) *Extremities:*

indicating in both was still

- (i) All fractures are to be noted including whether they are open or closed. If bilateral, then it should be established whether they are concomitant the direction of application of force.
- (ii) Hands – Contusion of thonar muscles with injures to metacarpophalangeal joints especially in the index finger and thumb should be looked for hands. This is sometimes of value for determining whether the pilot holding the control column at the time of crash impact.

(f) *Burns:*

Tissues for (preferably including preserved in such cases.

Evidence of body reaction like hyperaemia, serum filled bullae etc. should be noted. A complete description of burnt surface is to be recorded. Histopathology from trachea, bronchi, lungs and skin adjoining unburnt areas) should invariably be

(g) *Petechial Haemorrhages:*

over

These should be observed wherever present specially subconjunctival and the face and their disposition noted.

IV. Extensive photographic records of all relevant autopsy findings, external as well as internal, must be made as this is of vital importance.

V. **The body after autopsy should be carefully stitched and preserved for handing over to the appropriate authority for disposal.**

COLLECTION, PRESERVATION, STORAGE AND DESPATCH OF SPECIMEN

In all fatal aircraft accidents, it is necessary to find out if the aircrew got incapacitated in the air, due to pre-existing disease or toxic factors culminating in the accident. For this purpose, it is necessary to routinely submit autopsy specimen for histological and Biochemical/Toxicological examination. Therefore, at the time of autopsy relevant organs/tissues/body fluids have got to be collected and forwarded to **I.A.M. (Avn.Path.Dept.)**, IAF, Vimanpura Post, Bangalore-560017 for the requisite evaluations. Instructions for collection, preservation, storage and dispatch of specimens are given in succeeding paragraphs.

Specimens for histological examinations:-

Preferably, pieces from all organs should be collected and preserved for histological examination as soon (after death) as possible. In dismembered/mutilated bodies, specimens should be collected from whatever organs/tissues are available. Organs/tissues showing abnormal findings must invariably be collected and preserved.

Generally, 1 cm thick pieces, each weighing roughly 150-200 grams from the following organs/tissues must be collected at the time of autopsy:

1. *Brain*

- (a) Cerebrum : Coronal section
- (b) Cerebellum : Coronal section
- (c) Midbrain including medulla oblongata.

2. Pituitary gland

3. Thyroid gland

4. Respiratory tract

- (a) Piece of Trachea (May be sent whole in cases of bodies).
- (b) Pieces from each lobe of both the lungs (Total 5 pieces)
- (c) Piece of Bronchi (associated with burns)

5. Heart and Aorta

- (a) Piece of Aorta.
- (b) Heart as a whole for better preservation as it is necessary to open the chambers of the heart. Cutting open the heart along its whole right and left borders is quite satisfactory. Unless the autopsy is done by a qualified pathologist, the coronary arteries should not be cut or probed.

6. Any enlarged or suspicious lymphnodes from the neck or thorax.

7. *Abdomen:*

- (a) Piece from stomach
- (b) Piece each from small and large intestines.
- (c) Liver
- (d) Each Kidney
- (e) Each suprarenal
- (f) Pancreas
- (g) Spleen

8. *Skin:*

In case of burns, burnt skin as well as the adjoining normal skin in its whole thickness should be collected and preserved.

Container:

0.005 gauge polythene plastic bags of the size 9" x 15" make very satisfactory containers. They are easy to handle, occupy very little space, cheap and easy to replace and hence are strongly recommended for use. Alternatively, any glass or plastic wide-mouthed bottles may be used.

Preservation

For preservation, pieces of tissues collected for post-mortem are placed in one or more plastic bags (depending upon the volume of specimen collected). The preservative solution, (about 5-10 times the volume of specimen contained in each of the bags) is then poured into all the bags. After the air has been evacuated, the bag is closed by knotting. For added security, each bag is placed in another empty plastic bag which is also closed by knotting. A proper label is attached to each bag giving name and other particulars of the deceased, date of collection etc.

Preservative:

The preservative to be used in all cases for histological studies is 10% FORMAL SALINE. This can easily be prepared fresh at the time of autopsy, using one more polyethylene bags (same as described for collection of specimen) as containers. Each bag (9" x 15" size) can contain

about 400 ml. of solution and these bags may be quite conveniently used for preparation of 10% Formal Saline solution. Accurately measured quantities of formalin and Sodium Chloride can be kept ready in small containers and when required can be mixed with tap water in polythene bag to get the required strength of preservative solution. 40 ml of Formalin, 3.6 gms of NaCl and 360 ml. (3/4 full polythene bag) tap water when mixed will produce 400 ml of 10% Formal Saline. Measured quantity of Formalin can be carried in McCartney bottles and sodium chloride in ordinary paper packets.

Storage:

Once the preservative has been added to the tissues, the storage is to be done at room temperature and storage in a refrigerator is not required.

Despatch:

The specimen bags are carefully packed inside a suitable and strong cardboard box or a packing case and dispatched to IAM, IAF, Vimanpura Post, Bangalore-560017 invariably through an escort. The specimen should never be sent by post/SDS. Apart from ensuring that the box is handled with care to avoid any leakage of preservative, no other steps are required to be taken enroute for such specimen (for histology).

A copy of detailed autopsy report must invariably accompany specimen forwarded for histological/toxicological examination to IAM.

Specimen for Biochemical/Toxicological Examination:

The biochemical/toxicological studies carried out and the tissues/body fluid required for such studies are indicated below:-

Study	Tissue/body fluid
1. Lactic Acid Estimation (only in cases where hypoxia is suspected)	Brain/Blood
2. Ethanol (Ethyl Alcohol)	Blood/Urine
3. Carbon mono-oxide	Blood/Muscle
4. Drugs (only qualitative Screening) contents/	Urine/Gastric
	Tissues.

Note: At present, facilities do not exist at IAM to carry out toxicological studies on tissues and hence they need not be sent to IAM.

Collection of specimens for Biochemical/Toxicological studies:

Lactic Acid :For brain, lactic acid estimates about 150-200 gms. of sliced brain is collected as soon after death as possible, in a polythene bag as used for collection of histology specimen. The bag is closed by knotting and immediately frozen under ice in thermos flask, or in the freezing

compartment of refrigerator. The ideal freezing agent is dry ice (carbon-dioxide, snow if available). No chemical preservative is to be used and the tissue is kept in a frozen state continuously during storage and transit till it reaches IAM, IAF. It is imperative that during transit, the ice in the thermos flask is frequently replenished by escort. Therefore, the escort should be properly briefed and given adequate amount of funds by the unit so that he (the escort) is in a position to buy and replenish ice enroute.

For blood lactic acid estimation 5 ml. of blood is collected in sodium fluoride (10 mgm Sod. Fluoride/ml of blood) either in any small well-stoppered sterile bottle or quite conveniently in unmedicated and sterile latex rubber condom(e.g.Nirodh) and closed by knotting. It should be ensured that the sodium fluoride is properly mixed with blood and storage and dispatch is done in thermos flask on ice. The rubber condom can be sterilized by auto claving in bulk and stored in the same way as is done in the case of surgical Gloves.

Ethanol: 5 ml.each of urine and blood is to be dispatched. Both, the urine as well as blood, are preserved with sodium fluoride @ 10 mgm ml. of fluid and can be collected in sterile latex rubber condom. The storage and dispatch is done in thermos flask on ice in the same way as for lactic acid.

Carbon mono-oxide: Both, muscle tissue and blood, are to be collected, preserved, stored and dispatched in frozen state without any chemical preservatives. Muscle can be collected in polyethylene bag in the same way a brain tissue for lactic acid estimation and about 20 ml. of blood in a sterile latex rubber Condom. During storage and transit freezing environments must be ensured at all times by frequent replenishment with ice.

Drugs: At present, only a qualitative screening test for some common drugs can be carried out on urine samples. For this, urine is collected without any *preservatives*, in a sterile latex rubber condom and kept continuously under frozen state, including during transit, in the same manner as described earlier.

Method of collection of body fluids in aseptic condition:-

Blood:

Blood specimen should preferably be collected from chambers of intact heart with the help of sterile syringe. The surface of the heart can be best sterilized by touching a red hot scalpel on the heart surface through which a puncture may be made without any danger of contamination of the specimen. If the heart is ruptured, the blood may be collected from one of the large closed veins of arteries. If no blood is forthcoming from these sources, as last resort, blood lying free in the thoracic cavity may be collected.

Urine:

The method of collection of urine from urinary bladder under sterile conditions is similar to the one employed for cardiac puncture.

Labeling and Dispatch:

Proper labeling of each of the specimen containers should be done giving the name of individual, date and time of collection, name if the specimen preservative used etc. For added security each of the polyethylene bags and latex rubber condoms containing the specimen should be

placed inside another plastic bag or condom. The specimen should invariably be dispatched to IAMAF through an escort and never by post / SDS.

FOR EXTERNAL EXAMINATION CHART



