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**UAE** General Civil Aviation Authority

## **CIVIL AVIATION ADVISORY PUBLICATION**

**CAAP 45**

## **BREATHING APPARATUS OPERATIONAL GUIDANCE**

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## **1. INTRODUCTION**

- 1.1 The purpose of this Civil Aviation Advisory Publication (CAAP) is to allow the Airport Fire Service to apply a risk-based approach to the wearing of breathing apparatus.
- 1.2 Breathing Apparatus is used in atmospheres that would be hazardous to health. Often the work undertaken in Breathing Apparatus (BA) will be complex, physically and psychologically demanding and in circumstances where the normal sensory perceptions are denied.
- 1.3 The procedures set out in this CAAP MUST be adopted by all fire fighters at certificated airports at all incidents requiring the use of Breathing Apparatus.
- 1.4 The use of standard procedures is essential to ensure:
  1. The competent use of BA,
  2. Adequate support and emergency arrangements,
  3. The safety of the individual wearer,
  4. The safety of other BA wearers at the same incident,
  5. The successful completion of operational incidents.

## **2. STATUS**

This is the first edition of CAAP 45 and is dated 05 September 2010. It will remain current until withdrawn or superseded

## **3. APPLICABILITY**

This guidance document applies to all aerodrome & heliport Rescue & Fire-Fighting Services.

## **4. REFERENCES**

1. Civil Aviation Regulations Part II,
2. UK Home Office Technical Bulletins: Breathing Apparatus Command & Control Procedures.

## **5. GENERAL DUTIES AND PROCEDURES**

- 5.1 Proficiency and safety go hand in hand and never more so than when BA is in use. To ensure proficient and safe BA operations a number of standard operating procedures have been adopted. These provide for all BA wearers to carry out their duties in accordance with the CAAP, and ensure that actions and reactions will be common, effective and speedily and safely carried out wherever fire-fighters are working together whilst wearing BA.
- 5.2 Standard procedures commence at the fire station as soon as a fire fighter comes on duty and continues throughout the incident.

## **6 COMMAND AND CONTROL PROCEDURES**

- 6.1 To bring any emergency incident to a successful conclusion effective command procedures are a pre-requisite. This is nowhere more apparent than at incidents involving Breathing Apparatus, where standard procedures are essential throughout the incident at all levels of command. BA wearers must be fully supported by appropriate resources and themselves must follow the standard procedures and instructions of the Airport Fire Commander if risks to their health and safety are to be minimised.
- 6.2 The Airport Fire Commander in overall charge of the incident and intermediate control officers should all concentrate effort and resources to maintaining a high degree of management over the BA operations and should ensure that the procedures adopted comply with this CAAP.

## **7. WHEN TO USE BREATHING APPARATUS**

- 7.1 There is a risk of permanent damage to health if BA fails to be worn in an irrespirable or toxic atmosphere. At any incident the AFC is responsible for ensuring that BA is worn whenever it is determined that its use will facilitate operational activities. BA should be worn whenever discomfort and possible injury to a fire-fighter's respiratory system can be avoided (such circumstances may include damping down or turning over after a fire or situations involving MMMF at aircraft incidents).
- 7.2 Only in most exceptional circumstances should fire fighters that have already inhaled smoke oxygen deficient or toxic fumes subsequently rig in BA. Once smoke or toxic fumes are present in the lungs it takes an appreciable time for them to be completely cleared.
- 7.3 BA is only worn on the instructions of the Airport Fire Commander at an incident. BA should only be worn with a DSU, lamp and personal line.

## **8. COMMAND AND CONTROL**

- 8.1 Very exceptionally, there may be operational circumstances where application of the full control procedures for BA use would be inappropriate.  
Examples would include:
1. Fire fighters working at the head of a ladder in open air but who would be affected by the effects of smoke or fume.
  2. Fire fighters in the open air who may be effected by smoke or fumes
  3. Fire-fighters undertaking turning over / damping down duties when an incident is under control

In such circumstances, the BA wearer must be under the general observation of at least one other crew member (who may be a BA wearer).

## **9. DUTIES OF THE AIRPORT FIRE COMMANDER**

- 9.1 The Airport Fire Commander will need to conduct an assessment of the developing and potential risk of the incident before committing BA crews. The main duties are explained below. There are various specific references to the AFC elsewhere in this Breathing Apparatus CAAP.
- 9.2 The Airport Fire Commander (AFC), depending on the urgency and the developments of the situation faced may need to make such assessments in stages (for example, where urgent rescues are required these must take priority). However, at all the need for life safety must be uppermost. The AFC should carry out all stages of risk assessment as soon as practical. The risk assessment should be continuous throughout the incident to enable the AFC to review plans in line with any developing risk. Where practicable and available the risk assessment process should be aided by off station visits to aircraft.

## **10. HAZARD IDENTIFICATION**

- 10.1 Some hazards will be relatively easy to identify, such as heat and smoke. Other hazards will require further investigations. The AFC must consider the:
1. Nature of the incident,
  2. Materials involved (or likely to become involved),
  3. The nature of the construction of the building,
  4. The nature and configuration of the aircraft,
  5. The importance of the building / aircraft (or risk area) relative to the hazards to the lives of those entering therein.

## **11 RISK ANALYSIS**

- 11.1 The urgent nature of some situations may require decisions about fire fighter deployment and tactics to be made immediately. However, where reasonable and practicable, the AFC should, when reaching a decision about the tactics to be deployed, take into account the following:
1. Need for rescues to be undertaken, and the likely number of people requiring rescue or removing from the risk area,
  2. Resources immediately available and how quickly other support might be obtained,
  3. Nature and extent of hazards
  4. The stability of the incident.
  5. Location, number and suitability of the entry points
  6. Risk to the public and properties
  7. Information available from people at the scene.
  8. Means of access to the risk area

## 12 RISK ASSESMENT

- 12.1 When reaching decisions on control of the risk, the AFC must consider:
1. Whether BA is required to deal with the incident and the appropriate level of BA control,
  2. The adoption of any other appropriate safety precautions required to be implemented in conjunction with the use of BA for a specific risk (e.g. chemical protective clothing),
  3. The siting and number of entry control points. (ECP),
  4. Deployment of BA teams, emergency and relief teams, and the need to ensure they are as well briefed as possible on the task and the possible risks involved,
  5. The use of guide lines,
  6. The need for BA communications,
  7. The need to appoint a Communications Officer,
  8. The implementation of special procedures for BA wearer distress,
  9. The experience of the BA crews available,
  10. The sufficiency of BA and associated equipment available to deal with the incident and the need to request any additional assistance required.
- 12.2 Any duties in section 12.1 above with the exception of 12.1.1) may be delegated to a Junior Officer providing he is competent in Breathing Apparatus Operations.
- 12.3 The AFC, depending upon the likely extent of the activity of BA wearers, should appoint other officers to assist with the management of the fire fighting and rescue activity at each ECP.

## 13 CONTROL PROCEDURES

- 13.1 To ensure the safe operations whilst in BA, it is essential that effective control procedures are employed. Control procedures **MUST** be implemented as soon as the decision is taken to use BA.
- 13.2 The responsibility of the Entry Control Officer (EOC) extends only to the control and management of the Entry Control Point (ECP) to the extent outlined in this CAAP.
- 13.3 The control procedures in this CAAP are designed from a single progressive system for managing BA operations. The procedures for "Stage I" and "Stage II" is understood by fire fighters stationed at UAE Certificated Aerodromes and have, therefore been largely retained to different levels of control that may be applied to differing demands and resources.
- 13.4 It is recognised that there may, of necessity, be occasional circumstances when full control procedures are unable to be implemented. To address this, procedures for Rapid deployment of fire fighters are set out within this CAAP. However, **Rapid Deployment procedures should only be used in exceptional circumstances.**
- 13.5 Where urgent action is required and a limited number of crew members form the initial attendance.

- 13.6 On arrival at an incident the AFC will need to assess the risk and available resources and apply the appropriate level of control. Control procedures MUST be in place and be sufficient to monitor the risk to the safety of BA wearers. The level of control will apply to the whole incident.
- 13.7 Particular attention is given to the use of Entry Control Points and the duties of Entry Control Officers in implementing the procedures. All fire fighters are required to maintain their understanding and use of these procedures whenever BA is in use for training and operational incidents.

## **14 BA ENTRY CONTROL POINTS**

- 14.1 Entry Control Officers (ECOs) are to be nominated for each Entry Control Point (ECP). Their duties will depend upon the procedures adopted (see stage1 & 2) the sitting and number of BA ECPs should take account of:
1. The size of the risk area,
  2. The location of access points to the risk area,
  3. The type of aircraft,
  4. The wind direction,
  5. The type of building (offices, terminal, hangar, etc),
  6. The physical limitations of the site, in particular, the obstruction to fire fighting and effective control that can exist if the site is divided by major roads, railways or rivers or other physical barriers,
  7. The likely development of the incident.
- 14.2 The ECPs should be sited as follows:
1. As near to the scene of operations commensurate with safety so that the maximum duration of the BA can be used,
  2. In safe air and in such a position that should the incident deteriorate it will not be necessary to relocate,
  3. So that, as far as practicable, the position of the ECP is easily located by all wearers.
- 14.3 The AFC should be aware of the location of all ECPs.
- 14.4 The number of ECPs should be the minimum necessary to deal with the incident effectively.

## **15 RAPID DEPLOYMENT PROCEDURES**

- 15.1 The objective may be met by maintaining minimum record of lapsed time since entry of the breathing apparatus (BA) wearers to a risk area. As far as practicable, the principles of the standard Stage I procedures should be extended to incidents requiring the rapid deployment procedures.
- 15.2 APPLICATION OF RAPID DEPLOYMENT PROCEDURES

**Rapid Deployment is for use in “exceptional circumstances” only.** The procedures may be used only when:

1. The total number of BA wearers in the risk area does not exceed 2.
2. It is immediately clear that persons are at great risk and in need of rescue, and are either within view or known to be within a short distance of the entry point.
3. Dangerous escalation of the incident can be prevented by immediate and limited action.

15.3 Where possible another crew member should be nominated as a Rapid Deployment Entry Control Officer (ECO), with responsibility for recording the wearer details.

15.4 All BA wearers MUST place their tallies in the Rapid Entry Control Board (RECB) before entering the risk area.

15.5 As soon as practicable and within 10 minutes Rapid Deployment procedures shall be replaced by BA control procedures. When transferring to Stage 1 or Stage 2 procedures care should be taken to ensure those BA tallies are effectively handled to ensure accurate and prompt recording and monitoring of BA wearers in the risk area.

## 16 CONTROL PROCEDURES

16.1 Each Entry Control Point at an incident will be recognised by being given a colour. The sequence of colours will always be the same.

<b>RED</b>	<b>WHITE</b>	<b>BLACK</b>	<b>GREEN</b>
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16.2 The first entry point set up at an incident will always be designated **AIRPORT RED ENTRY CONTROL POINT**, and remain red throughout the incident.

16.3 The entry control officer will be AIRPORT RED ENTRY CONTROL OFFICER.

16.4 If there were an internal situation on aircraft, the first entry control point, say at the front of the aircraft would be red entry control point. If another entry control point were set up say at the rear of the aircraft this entry control point would become ENTRY CONTROL POINT AIRPORT WHITE.

## 17 BREATHING APPARATUS TEAMS

17.1 All breathing apparatus teams passing through an entry control point will be listed the colour of the Entry Control Point.

17.2 If RED entry point is set up at the front of the aircraft, all teams passing through will be Red Teams. The first team will be called AIRPORT RED 1 and all other teams will be numbered, there will be no other teams called AIRPORT RED 1 during the same incident. During an incident where there are lots of teams entering the risk area, teams could be numbered RED

20 or more. If the other Entry Control Point is set up at the rear of the aircraft, this will be Entry Control Point Airport White and teams will be called AIRPORT WHITE 1 etc.

The same procedure applies at building fires.

- 17.3 AT ALL INCIDENTS THE FIRST ENTRY CONTROL POINT SET UP WILL BE DESIGNATED RED AND ALL BREATHING APPARATUS TEAMS PASSING THROUGH THAT ENTRY CONTROL POINT WILL BE RED TEAMS.

## **18 STAGE 1 CONTROL PROCEDURES**

- 18.1 To apply control procedures to meet the demands of small or limited incidents and to monitor the safety of Breathing Apparatus (BA) Wearers.

### **18.2 STAGE ONE PROCEDURES**

18.2.1 These objectives are met by:

1. Ensuring all fire fighters are aware Stage 1 procedures are being applied,
2. Appointing an Entry Control Officer (ECO) to implement procedures at the Entry Control Point (ECP),
3. Recording BA wearers entry (using their tallies and monitoring their estimated air supply),
4. Ensuring effective communications between BA wearers and ECOs,
5. Appropriate provision for relief and / or emergency teams,
6. Applying the procedures for use of related BA equipment.

#### **18.2.2 APPLICATION OF STAGE ONE PROCEDURES**

Stage 1 procedures apply where:

1. The size of the incident is small and the use of BA is unlikely to be protracted,
2. No more than two ECPs are used,
3. The total number of BA wearers within the risk area does not exceed 10.

### **18.3 DUTIES OF THE AIRPORT FIRE COMMANDER (AFC)**

- 18.3.1 The AFC is responsible for nominating an ECO to monitor the implementation of Stage 1 procedures and establish an ECP to the risk area. During application of the procedures the AFC is responsible for effectively monitoring the BA wearers / teams within the risk area and for ensuring that effective briefing and de-briefing takes place.

### **18.4 DUTIES OF STAGE ONE ENTRY CONTROL OFFICERS**

- 18.4.1 Stage 1 ECO duties are restricted to those directly related to the monitoring of breathing apparatus wearers who have entered the incident using their Entry Control Point. It may be

necessary to have an officer close by to give direction as to the fire fighting requirements, equipment supply or casualty handling.

For identification purposes, the ECOs must wear a black and yellow BA Control Tabard.

## 19 MONITORING PROCEDURES

### 19.1 The ECO shall:

1. Take up position nominated by the AFC for the ECP,
2. Provide an Entry Control Board (ECB), complete with waterproof marker,
3. Indicate clearly that Stage I is in operation and ensure the ECB is clearly sited,
4. Check the clock,
5. Receive tallies of BA wearers and check that the name of the wearer and the cylinder content at the time of entry into the risk area are correct. (Not less than 80%),
6. Enter the 'time in' on each tally,
7. Place the tally in a slot in the ECB so that the tallies of each team of wearers are together and are indicated as a team by bracketing the tallies using the waterproof marker. (The earliest time of whistle being placed outside the bracket).
8. Calculate the time of whistle of each wearer using the ECB duration calculator and then enter this in the appropriate section on the ECB opposite the tally. The time of whistle should be calculated by:
  - i. Taking into account the level of risk exposure,
  - ii. Carefully referring to the correct section of the duration clock,
  - iii. Acting on the guidance of the AFC, if necessary, restrict the length of exposure in difficult or strenuous conditions. The BA wearer and team leader must be advised to withdraw from the risk area at a predetermined pressure gauge reading. The ECO should calculate the time of exit and make a note in the remark column accordingly,
  - iv. Where appropriate, taking into account any lapsed time since entry of BA wearers who entered the risk area under rapid deployment procedures.
9. Indicate and record details in the "remarks" and "location of Teams" column on the ECB as necessary.
10. When BA teams exit the risk area, remove their tallies from the ECB and return them to the respective wearers.
11. If appropriate ensure they are fully de-briefed.
12. Where a BA team re-enters a risk area (annotate the ECB).
13. Where practicable ensure BA wearers are appropriately pre-briefed prior to entry in to the risk area.
14. Keep the AFC informed of all developments or requirements related to the wearing of BA and the operational aspects of the incident, using information gained from BA wearers at the incident.

## 20 MISCELLANEOUS DUTIES

The ECO shall:

1. Whenever radio communications are to be used, carry out a radio communications check prior to entry into the risk area,
2. Attach BA main guideline tallies to the appropriate line as necessary and remove them when the line is no longer required,
3. Inform the AFC of any prolonged breakdown in radio communications with BA teams,
4. Notify the AFC if it is considered necessary for crews to stand by at the ECP.

## 21 EMERGENCY PROCEDURES

The ECO shall:

1. Commit an emergency team(s) if available and immediately inform the AFC of the incident if:
  - i. Any team fails to return to the ECP by their time of whistle
  - ii. A DSU is operated.
  - iii. It is clear that a dangerous situation is developing which will affect the BA team(s).
  - iv. It appears a wearer is in distress.
2. Prior to entry, ensure the emergency teams are suitably briefed.

**As soon as resources permit, a minimum of 2 BA wearers should be kept available at the ECP for emergency purposes.**

## 22 SPECIAL INCIDENT DUTIES

- 22.1 At incidents involving radiation or hazardous chemicals, liaise with the Decontamination Officer. Where a radiation check is considered necessary by the AFC, the ECO must ensure that all personnel are fully briefed on entering the risk area. The ECO must also enter the dosimeter reading on the reverse of the tally on entry of the wearer, whilst wearing the appropriate protection, check the dosimeter reading when the wearer leaves the risk area. A permanent record must be made and passed to the AFC at the conclusion of the incident. A chemical information data system could be used to identify additional safety measures and decontamination procedures at hazardous chemical incidents.

## 23 OPERATIONAL PROCEDURE

**The ECP should have First Aid and resuscitation equipment available.**

## **24 STAGE 2 CONTROL PROCEDURES**

The ECO shall be responsible for:

1. Ensuring all fire fighters are aware Stage 2 procedures are in operation,
2. Appointing an Entry Control Officer (ECO) to implement procedures at each Entry Control Point (ECP),
3. Recording BA wearers entries (using their tallies) and monitoring their estimated air supply,
4. Ensuring effective communications between BA wearers and Entry Control Officers,
5. Providing appropriate provisions for relief and or emergency teams,
6. Application of procedures for the use of related BA equipment

## **25 APPLICATION OF STAGE 2 CONTROL PROCEDURES**

25.1 Stage 2 entry control procedures normally supersede Stage 1 procedures and are used where one or more of the following apply:

1. The scale of operations is likely to be protracted or demand greater control and supervision than is provided by Stage 1 procedures,
2. More than two ECPs,
3. More than 10 BA wearers are committed into the risk area at one time,
4. Branch guidelines are used.

## **26 DUTIES OF AIRPORT FIRE COMMANDER (AFC)**

26.1 The AFC is responsible for the overseeing the implementation of Stage II procedures and establishing Stage II entry control at every ECP into the risk area. During the transition from Stage I to Stage II procedures care should be taken to ensure that the number of BA wearers whose entry control tallies are supervised by an ECO (on one or more ECBs) does not exceed 10 (excluding the emergency team)

## **27 NOMINATION OF ENTRY CONTROL OFFICERS (ECOs)**

27.1 Stage 2 ECOs are required to supervise each ECP. The AFC on arrival at an incident will need to give careful consideration to the complexity of the incident before confirming the personnel selected as ECOs. In broad terms, the greater the complexity of the incident the greater the rank needed as ECO duties. However, in all cases, the ECO must be an experienced BA wearer. In circumstances where it has not been possible for the AFC to appoint an officer to manage operational requirements at the ECP, the ECO should be a minimum rank of Crew Commander. An additional Control Officer (any rank) should be appointed for each additional group of 10 BA wearers entering the risk area through the same ECP. If practicable, and where resources

permit, a fire fighter should be appointed to assist the ECO, especially when several BA teams are being monitored at the same time.

## **28 DUTIES OF STAGE 2 ENTRY CONTROL OFFICER**

28.1 The duties of a Stage 2 ECO include all specified for a Stage 1 ECO. Additionally, the Stage 2 ECOs duties include.

## **29 MONITORING PROCEDURES**

The ECO shall:

1. Ensure the ECB indicates that Stage 2 procedures are being applied,
2. Check the “time of whistle” calculations of the Stage 1 ECO being relieved,
3. Ensure BA teams are relieved at the scene of operations in sufficient time to allow their return to the ECP by their time of whistle,
4. Have available (at least 5 minutes before they are due to enter) sufficient teams to allow pre-entry checks and briefing to be completed without delaying their entry,
5. Liaise (by radio or runner etc) with the other ECPs and inform them of the names of BA wearers who leave the risk area other than via the control point at which they entered,
6. Liaise with Main Control, if one is established and ensure that personnel who have collected their tallies report immediately to main control,
7. Ensure that if it becomes necessary to use additional ECBs, tallies remain on the initial ECB under the control of the ECO (tallies must NOT be transferred to a second ECB until wearers collect their tallies and the initial ECB can be disestablished),
8. Synchronise the clock of the Stage 2 ECB and main Control clock to the clock on the first ECB used.

## **30 MISCELLANEOUS DUTIES**

The ECO shall:

1. Nominate BA communications teams and communications operators,
2. If appropriate, supervise communications between the leader of a line communications equipment team and the AFC of the incident,
3. Attach BA main and branch guideline tallies to the appropriate line as necessary and remove them when the line(s) are no longer required,

4. Annotate the ECB with details of which team has been committed with which guideline.

### **31 EMERGENCY PROCEDURES**

#### **31.1 The ECO shall:**

1. Have a fully equipped emergency team rigged and standing by at each ECP throughout the period that the ECP is in operation.
2. Commit the emergency team if line communications is lost.

31.2 Stage 2 ECO duties are restricted to those directly related to BA functions. It may therefore be necessary to have an officer close by to give directions as to fire fighting requirements, equipment supply or casualty handling.

### **32 CONTROL PROCEDURES**

32.1 The Airport Fire Commander of any incident will determine whether or not breathing apparatus is to be worn and will decide the number and position of the Entry Control Points and the level of control.

32.2 The level of control decided by the Airport Fire Commander applies to the whole incident and shall not be varied for different entry points.

32.3 The responsibility of Entry Control Officers extends to the control and management of the Entry Control Point under their control.

32.4 Airport Fire and Rescue personnel acting as an Entry Control Officer are only to be responsible for Airport Fire and Rescue Breathing Apparatus teams and not those of the Civil Defense Fire Service.

### **33 SIZE, COMPOSITION AND CONDUCT OF BA TEAMS**

33.1 The Airport Fire Commander will need to consider carefully the size and make up of BA teams and must ensure that the leader(s) is fully briefed of what is required of the team. Effective leadership is required and the AFC should ensure, so as far, as is practical, that the team is led by an experienced BA wearer. For more complex, difficult or dangerous incidents, team leaders should be drawn from experienced Crew Commanders or above. BA Crews should be formed from teams from the same station or brigades and led by their own Crew Commanders.

33.2 The AFC should increase the size of the BA Team in relation to the range and demands of the tasks to be carried out. The more difficult or complex task(s) will sometimes benefit from larger BA teams but too many BA wearers in a team can slow down operations. The size of a team should reflect the BA wearers' experience and competence in anticipated tasks.

Teams of two to four wearers will usually provide optimum effectiveness.

- 33.3 In normal circumstances, BA wearers who enter the incident as a team should remain as part of the team for the whole time they are in the risk area. Teams may divide only for specific tasks and with the prior instruction of the team leader.
- 33.4 Where the duration of the division is likely to be for an extended period of time the Entry Control Point (ECP) must be informed. A new team leader must be appointed for the newly separated team. (This would only apply for BA teams of 4 or more wearers). Only in exceptional circumstances should a BA team divide on any occasion.
- 33.5 A BA wearer is not to enter a risk area alone, nor is a wearer to be left alone in the risk area, either to work or withdraw from the risk area.
- 33.6 The monitor operator of any airport appliance can for comfort and personal protection wear BA. However, the BA wearer is not to enter any aircraft, building or risk area.

#### **34 DUTIES OF BA WEARERS AT AN INCIDENT**

- 34.1 For fire fighters to be able to carry out all BA wearer responsibilities in a safe and professional manner at an incident involving Breathing Apparatus.

Fire fighters ordered to wear Breathing Apparatus at an incident shall:

1. Check that the apparatus is functioning correctly by carrying out the correct tests (including checking the tally details for correctness and the DSU by operation) (see General Check page)
  2. Hand their tallies to the Entry Control Officer (ECO) at the Entry Control Point (ECP) before entering the risk area.
  3. Regularly check their pressure gauge whilst in the risk area.
  4. Monitor air consumption,
  5. Allow sufficient duration to withdraw to the ECP before the low-pressure warning whistle sounds,
  6. Update the BA team leader, as appropriate,
  7. Maintain regular verbal contact with other members of their team,
  8. Collect their tally from the ECO in final exit from the risk area,
  9. On collecting their tally, ensure that the information of use to BA teams entering the risk area, or the officer-in-charge (AFC), is made known to the ECO,
  10. After collecting their tally, report to the BA Main Control (if one is in operation)
- 34.2 If a replacement cylinder is fitted and the BA is required for immediate re-use by the original wearer the tests should include those checks referred to in paragraph 1(a), with the exception of the checking of the DSU.

34.3 Fire fighters required to wear BA must maintain the area of the seal free from hair (facial or head). Failure to do so will impair the efficiency of the seal and an avoidable safety hazard to the BA wearer.

34.4 Guidance on wearing procedures and the responsibilities of a BA team leader can be found in this manual.

## **35. DUTIES OF THE BA TEAM LEADER**

35.1 A member of the BA team should be designated as team leader and, where possible, should be a minimum rank of Leading Fire Fighter.

35.2 The BA team leader shall:

1. Ensure the team leader is fully briefed before entry into the risk area
2. Co-ordinate gauge checks and ensure that the team return to the Entry Control Point (ECP) before any low pressure warning whistle activates, or, if appropriate, within limits previously agreed with the AFC to prevent undue exposure to difficult or strenuous conditions.
3. Monitor the working conditions and be aware of the potential physiological effects that they may cause to team members and working duration.
4. Update the ECO if communications equipment is being used.
5. Inform the ECO, as soon, as it is practical, of any development of the operational incident that is likely to be considered significant by the AFC.

35.3 The BA team leader is responsible for the conduct of the team during the time the team is within the risk area. The team leader will base decisions for action on:

1. The training and experience gained from previous incidents
2. Information received by communications from outside the risk area.
3. Sensory perception inside the risk area (e.g. noise, temperature)
4. Information from BA and associated equipment (e.g. gauges, whistles, thermal image cameras).
5. Other BA team members.

35.4 BA team leader's duties also extend to decisions about when to withdraw from the risk area and responding to DSUs (see emergency procedures).

35.5 BA wearers are often at the forefront of fire fighting activity. BA team leaders and crew members should therefore be alert to the potential for flashover and/or backdraught.

## **36 INCIDENT PROCEDURES / B.A. WEARER PROCEDURE**

36.1 In addition to the general Command and Control procedures set out in this manual, there are a number of particular points to note in relation to operational safety at an incident.

36.2 In addition to the duties of a wearer, BA wearers should;

1. Don and start up their BA set in safe air, and check the set and facemask for security of fit and the main valve is fully opened.
2. Check lamps and firefighting equipment by operation immediately before entering the risk area and at intervals appropriate to the incident.
3. Check communications equipment immediately before entering the risk area and at regular intervals whilst in use.
4. Check pressure gauges before entry and agree the reading shown on the tally with the Entry Control Officer (ECO) (unless rapid deployment procedures are in use).
5. Monitor pressure gauges at regular intervals throughout the time in the risk area (in addition, BA team leaders should check the gauges of all team members at regular intervals).
6. As far as practicable, comply with the instructions given by the AFC and ECO and any instructions given by the team leader.
7. Withdraw from the risk area on the instructions of the team leader (see withdrawal of BA teams page).
8. Collect tallies from the ECO as wearer's exit from the risk area.

<p>Wearers should not wear BA if the pressure gauge indicates contents less than 80% of the full capacity</p>
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## **37 WITHDRAWAL OF BA TEAMS**

37.1 The decision about when to withdrawal from a risk area is a very important one. The central aim must be to ensure that all BA team members return to the Entry Control Point (ECP) by the estimated time of whistle, subject to circumstances which develop since the time of entry which necessitate an early withdrawal. However, the timing of withdrawal from the risk area must take into account.

1. Unusual physiological or psychological stress or discomfort experienced from rapid temperature increase.
2. The depth of penetration into the risk area when using BA guidelines.
3. Deteriorating situation

### **38 APPLICATION OF WITHDRAWAL PROCEDURES**

- 38.1 The AFC, ECO's and BA team leaders duties extend to ensuring that BA wearers must not be exposed to an inappropriate level of risk. BA wearers are also responsible for ensuring that team leaders are made aware of any relevant developments that might lead to the need for an early withdrawal from the risk area.
- 38.2 BA team leaders must not rely solely on cylinder contents when reaching a decision about when to withdraw their team but should take into account information received from all sources. BA team leaders must withdraw their team if any member:
1. Has uncontrolled loss of pressure
  2. Appears to be unwell, confused or in discomfort (especially when exposed to rapid temperature increase).
  3. Has a gauge, which has become faulty or unreadable.
  4. Has been exposed to an irrespirable atmosphere due to a BA failure.
  5. Has a low pressure warning whistle activation.
- 38.3 Team withdrawal should also occur when:
1. The team leader, acting on personal initiative, experience, and assessment or on advice of team members, decides that conditions in the risk area have deteriorated to the extent that BA team members are exposed to an inappropriate level of risk.
  2. A team member reaches a pre determined pressure gauge reading set by the AFC following assessment of physiological risk and other relevant information.
  3. The emergency evacuation signal sounds (ACME Thunder Whistle continuous short blasts)
- 38.4 For the teams of three or less, the whole team should withdraw whether or not the task is completed. However, at the BA team leader discretion part of the team may withdraw from the risk area, for example:
1. Where the team members number four or more a team could split with only two members having to withdraw.
  2. Where a low pressures warning whistle activates prematurely due to set malfunction.
  3. A minor leak to the facemask.
- 38.5 On no account should a BA team divide following entry into the risk area to undertake a separate task, and on no account should a BA wearer attempt to leave a risk area unaccompanied. The AFC should immediately be advised of any decision to withdraw prematurely from the risk area.

## **39 ENTRAPPED PROCEDURE**

39.1 To allow a BA wearer to maximise the duration of a BA set in the event of becoming trapped.

The aim of the entrapped procedure is to allow a BA wearer to maximise the duration of a BA set in the event of becoming trapped and being unable to withdraw from the risk area.

No provision exists for conserving the air supply in open circuit BA other than by the wearer moderating demand for air by using the least possible energy.

When a wearer of a compressed air BA becomes aware that it is not possible to escape the risk area, the following action should be taken:

1. Operate the DSU.
2. Relax as much as possible in the circumstances by assuming a reclining or seated posture
3. Breathe calmly and gently.
4. Try to make radio contact with the ECO or other BA teams.
5. If a charged branch is available and can be operated, any combustible material in the vicinity should be saturated in order to retard the fire spread.

Any supplementary supply function should not be operated. The cylinder valve should not be adjusted, other than checking that it is fully open.

39.2 The low-pressure warning whistle will operate when the cylinder pressure has fallen to a point where the Safety Margin remains. (The air consumed by the operation of the low cylinder pressure warning whistle is 4 litres per minute)

39.3 BA team members should encourage each other to remain conscious and alert at all times.

## **40 EMERGENCY TEAMS**

40.1 To provide prompt emergency assistance to breathing apparatus (BA) wearers, Emergency teams of BA wearers must be established at all incidents where Stage 2 BA Entry Control Procedures are in operation and at other incidents as soon as personnel resources permit.

40.2 The Entry Control Officer (ECO) is responsible for informing the Officer-in-Charge (AFC) of the need for an emergency team. The AFC shall nominate an emergency team of BA wearers from those available at the incident. The composition of the emergency teams will depend upon the nature of the incident, the location of BA wearers and the number of BA wearers in the largest teams. A minimum number of two BA wearers will be required for every emergency team and these will be equipped with cylinders with at least equivalent maximum duration to the BA of the wearers committed to the risk area.

40.3 The emergency team shall be suitably equipped for the incident at hand. This may include for example.

1. Radio Communications equipment.
  2. Resuscitation equipment
  3. An additional BA set.
  4. Any other specialist equipment provided for this purpose.
- 40.4 All equipment should be tested and ready for immediate use. Where BA wearers at an incident are wearing protective clothing in addition to their BA, the emergency team will be similarly protected.

## **41 DEPLOYMENT OF EMERGENCY TEAM**

- 41.1 To provide a prompt emergency assistance to breathing apparatus (BA) wearers, the following procedures should be applied:
1. The emergency teams should rig (but not start up) in B.A. and stand by at the ECP until instructed to enter the incident by the ECO or until relieved of that duty or the conclusion of B.A. operations,
  2. Prior to entry, the ECO will ensure that all members of the emergency team are fully briefed about the emergency. The likely location of the wearer(s) in distress (if this is known) and will collect the wearers tallies and record their actions on the Entry Control Board (ECB),
  3. When available, existing B.A. guide lines or communications lines should be followed (If working on a hose line this may also be used to trace the steps of the distressed team but care should be taken that the correct hose lines is followed),
  4. Following deployment, the ECO should inform the AFC of the incident and call for a replacement emergency team.

## **42 RECORDING OF DAILY INSPECTIONS**

- 42.1 At the start of each watch/shift, it is the responsibility of all nominated BA wearers to make sure that the appropriate tests are made to the breathing apparatus sets allocated to them as against their name on the riding positions.
- 42.2 On completion, the tally belonging to that set must register the wearer's name, and the cylinder contents.
- 42.3 The sets record book must be completed as soon as practicable in black or blue ink, showing the date, cylinder number, contents in bars, remarks and signed for by the nominated wearer. Red ink is to be used after Heat and Smoke Exercises and actual Incidents.
- 42.4 **A wearer who has been unable to record that the tests have been carried out should be aware that by wearing the set he has indicated that it is working satisfactorily.**
- 42.5 Any defects to the apparatus should be reported to the officer in charge of the duty watch.

## **43 THE GENERAL CHECK**

- 43.1 The testing of breathing apparatus is only to be carried out by personnel qualified to wear breathing apparatus.
- 43.2 The general check should be carried out by all fire fighters nominated to wear breathing apparatus at the following times:
1. At the start of each watch, or as necessary at other times during the watch,
  2. After the set has been serviced,
  3. After drill or incident
- 43.3 The general check consists of the following:
1. Carry out a good visual check of the apparatus and cylinder for damage, including Backplate, Harness and all Stitching and fasteners,
  2. Slacken off all straps,
  3. Check all finger tight connections,
  4. Remove the facemask from its bag and examine for damage (mask, visor and head straps especially around buckles). Check mushroom valves are in place on the inner mask (oral/nasal mask),
  5. Turn the demand valve into test position,
  6. Open the cylinder valve fully, (if the cylinder contents is less than 80% change the cylinder) fit facemask and adjust the straps (bottom pair, middle pair, and top strap). Positive pressure will activate on first inhalation,
  7. Take two deep breaths, holding the third, listen for any audible leaks,
  8. Check function of supplementary supply,
  9. Close the cylinder valve fully, move head up and down and side to side to check for leaks while monitoring the pressure gauge. Then slowly breath down the set until the low pressure warning signal activates at 55 bar, a low pressure warning whistle will also operate at this setting. Draw the facemask firmly onto the face to ensure there is no inward leak into the facemask,
  10. Remove the mask and clean with the B.A. wipes should be provided, then place the mask into its protective bag,
  11. Check the manual operation of the DSU,
  12. Fill out the tally (rank, name and cylinder pressure),
  13. Check the torch by operation and inspect the sets personal line fully,
  14. Check the appliance mountings onto which the apparatus is stowed,
  15. Fill in the Breathing Apparatus logbook pertaining to that set,
  16. Report any defects to the Duty Officer.

#### 44 MONTHLY TEST

44.1 This test should include:

1. A minimum wearing duration of 50 bars (itself preceded by a full general check),
2. This test can be part of a normal wear at an incident or drill provided it is of at least the minimum duration stated above,
3. Remove the cylinder from then apparatus,
4. Examining the cylinder strap(s) for damage and wear,
5. Examining all the apparatus straps (harness) for damage and wear,
6. Examining the attachment points for the personal line,
7. Check the cylinder connection,
8. Refitting a cylinder filled with at least 80%,
9. Carry out a full general check of the apparatus,
10. Record the test in the sets logbook as a monthly test,

#### 45 CONTROL OF BREATHING APPARATUS TALLIES

- 45.1 Personnel wearing breathing apparatus are not to enter a risk area without first handing in the breathing apparatus tally to the Entry Control Officer.
- 45.2 Personnel withdrawing from the risk area should report to the Entry Control Officer **with their face mask in position**. The Entry Control Officer will instruct them to remove their facemask and close down their sets before returning their tally.
- 45.3 If a team withdraws to collect a piece of equipment, or pass a message etc, but do not remove their facemask, close down their sets or collect their tallies but immediately re-enter the aircraft / building, this is part of their initial working
- 45.4 A team withdrawing from the risk area, closing down their sets, accepting their tally, may then service their sets. If they do this and then have to make another entry into the risk area, this is a new entry and fresh records are required.
- 45.5 If, after withdrawing, closing down and reporting to the Entry Control Officer, a team is required to re enter the aircraft / building to perform a specific task and the officer in charge is satisfied that the content of their cylinder is sufficient, even though their pressure gauge may record less than 80% of their contents, this is a re entry and fresh records are required. **In any case wearers are not to re-enter an area with a cylinder content of less than 100 bars.**

On the front

1. Name of Airport
2. Set number permanently marked
3. Cylinder contents in litres permanently marked
4. Space for name
5. Space for cylinder pressure
6. Space for time in
7. Duration and no fresh records are required.

<b>AIRPORT NAME</b>		<b>COMP AIR</b>	<b>No. 22</b>
<b>NAME</b>		<b>CYL. PRESS</b>	<b>TIME IN</b>

On the rear

The Tally is attached to the DSU

1. Space for dosimeter reading in and out

<b>DOSIMETER READING</b>		
<b>IN</b>		<b>OUT</b>

## 46 DURATION OF BREATHING APPARATUS

- 46.1 The rate of consumption of air of open circuit breathing apparatus can vary over a wide range. This range of variation depends upon a number of factors, which include the work rate of the wearer, their physique and the environmental conditions in which they are working.
- 46.2 To enable the duration of open circuit breathing apparatus to be estimated an average consumption rate of 40 litres per minute can be used.

### 1. FULL DURATION

The period during which the breathing apparatus is expected to provide respiratory protection from the moment the cylinder valve is open until the cylinder contents are exhausted.

### 2. WORKING DURATION

The period during which the breathing apparatus is expected to provide respiratory protection from the moment the cylinder valve is opened until the low pressure warning whistle sounds.

### 3. SAFETY MARGIN

The period during which the low pressure warning whistle operates.

- 46.3 Formula for calculating the duration of breathing apparatus is as follow

$$D = \frac{P \times C}{N \times 40} - 10$$

Where

- D = The remaining working duration (in minutes)
- P = The pressure in the cylinder (bars)
- N = The maximum filled pressure of the cylinder (bars)
- C = The capacity (in litres) of the cylinder when pressurised to N bars.

## 47 STAGE 1 AND STAGE 2 CONTROL BOARDS

- 47.1 The same design board is used in both stage 1 and stage 2 control procedures. The control board comprises of a Perspex covered board about 300mm in width and 800mm in height.

The upper section of the board contains a calculator for calculating the working duration of the breathing apparatus it also has a clock.

The remainder of the board comprises, under Perspex cover, 12 divisions into which the breathing apparatus tallies can be inserted. **Two divisions are permanently marked and are intended for the tallies of the emergency teams only.** Corresponding spaces permit entries under the headings;

1. Time of whistle
2. Location of teams
3. Remarks

47.2 Entry control boards should be checked at the start of each watch.  
The examination should include;

1. Checking that the board is clean. No past entries on display.
2. Examine for damage or excessive wear.
3. Check that the board has a waterproof marker suitable for Perspex.
4. Check that the clock is working and the time is correct.
5. Check that the board is on the appropriate appliance.
6. Check that there is a black and yellow tabard.

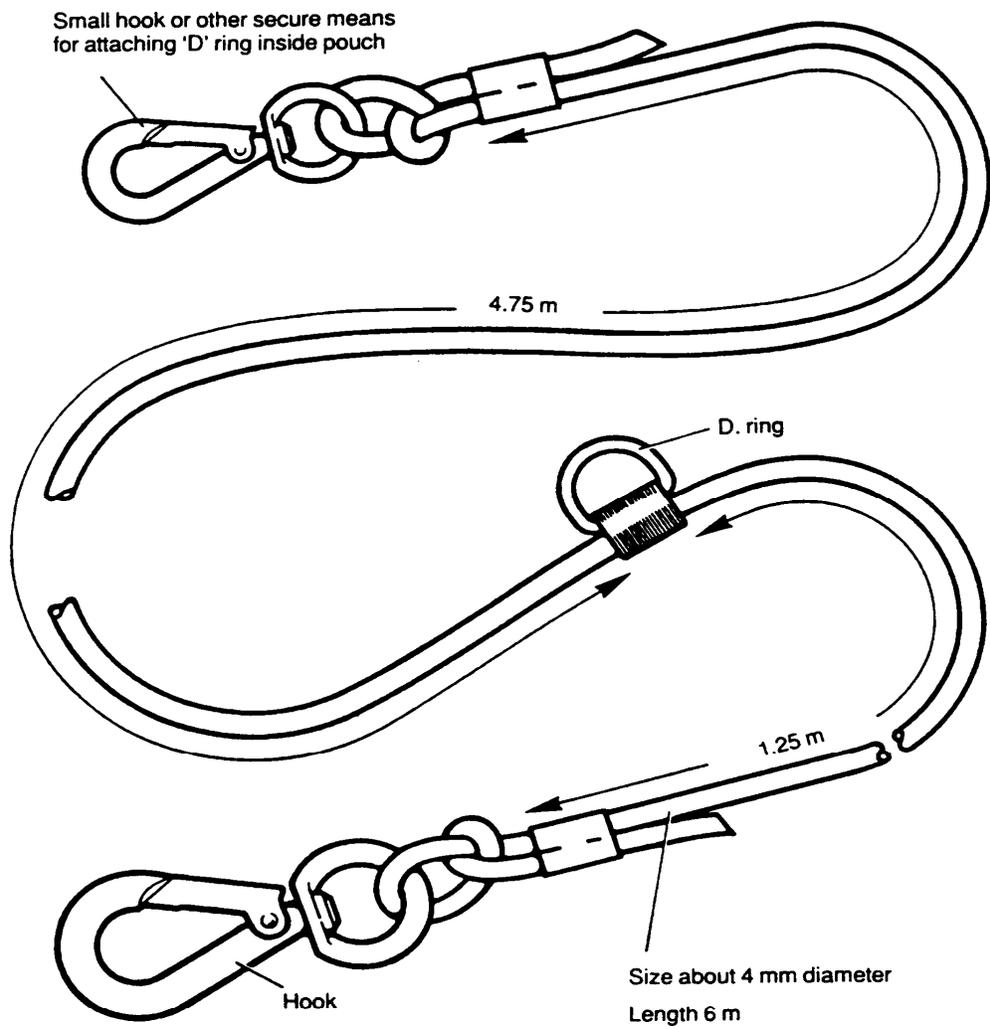


## Identification of Breathing Apparatus Entry Control Officer

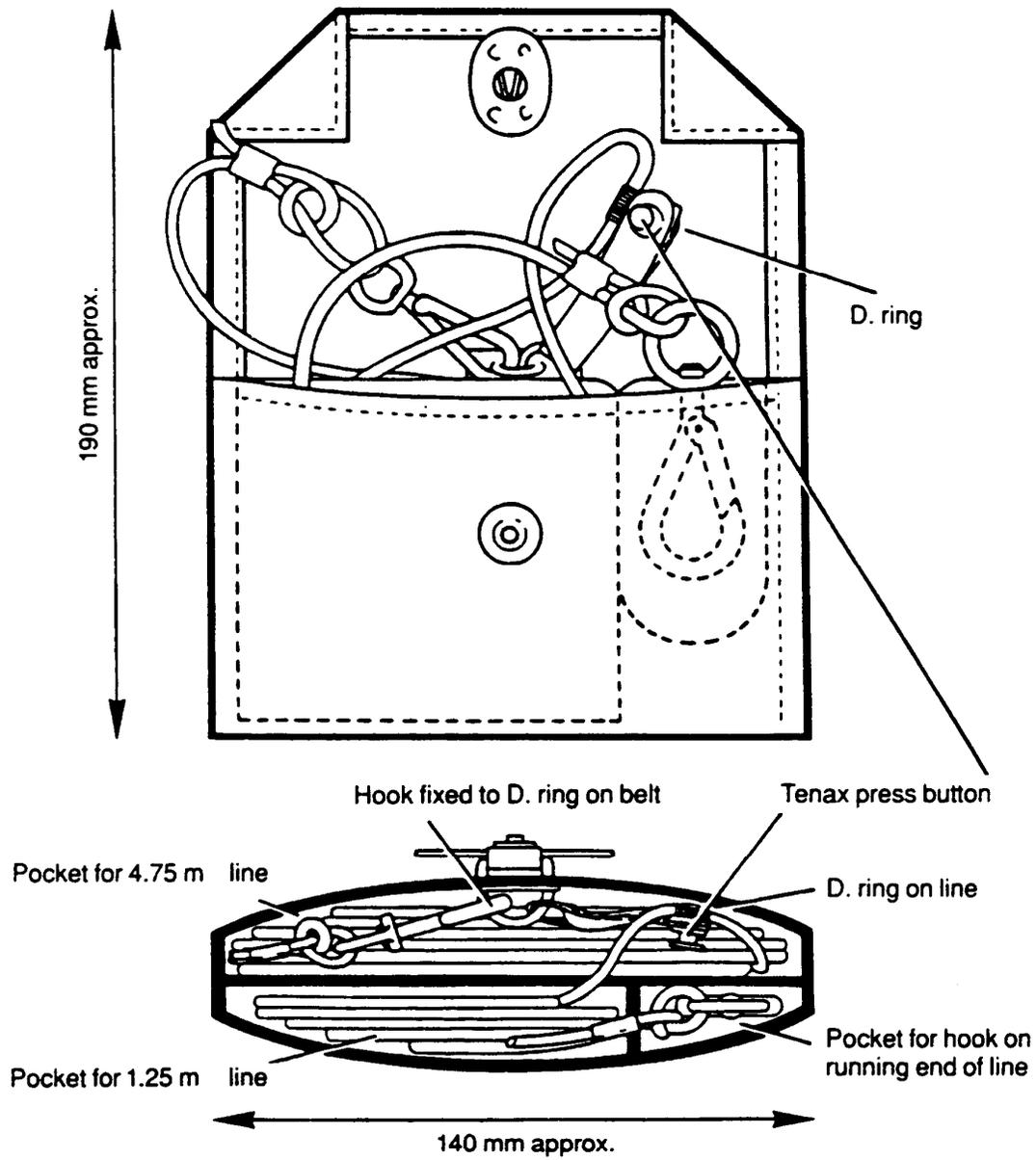


## **48 PERSONAL LINES**

- 48.1 The personal line is 6 meters long. One end of the line should be fastened to a “D” ring, which is passed through a shaped slot in the rear of the personal pouch to permit this fastening. A snap hook or other suitable device, such as a Karabiner, is fastened to the other end of the personal line. A further “D” ring is permanently fastened to the personal line 1.25 meters from the snap hook at the running end. In normal stowage this second “D” ring is secured to the short length of strap by a clip. The strap is secured to the removable ring anchoring the standing end of the personal line to the breathing apparatus harness. This method of fastening permits the personal line to be paid out in two separate lengths, a short length of 1.25 metres, which may be, extended to the full length of the line 6 metres.
- 48.2 The line is stowed in a pouch attached to the harness of the breathing apparatus set, which is provided with internal pockets. The smaller of the main pockets accommodates the 1.25 metre of line and the largest pocket the remaining line. The smallest of the pockets houses the snap hook. Line is always to be stowed in a haphazard fashion to avoid tangles. On the dog lead type of personal line the 1.25 metre length is identified by a knot in the line and stowed by a spring loaded recoil system.
- 48.3 The personal line should be examined as part of the daily check of the breathing apparatus you have been allocated to wear.
- 48.4 The personal line allows members of a breathing apparatus team to attach themselves to each other or to a guide line using the 1.25 metre length of the line and also permits a search to be extended from the main line to the full extent of the personal line.
- 48.5 When a guideline is being laid, all the members other than the team leader are to attach themselves to the member in front of them by the short length of the personal line. Alternatively, all members of the team, other than the team leader, may attach themselves to the guideline using the short length of their personal line.
- 48.6 After the line has been laid the leader of the team following it must be attached to it by the short length of their personal line. The other members of the team must be attached by their short length of their personal line to the team member in front or to the guideline.
- 48.7 When attached individually to the guideline team members should also remain within physical contact distance of the remaining members of the team.



Personal Line

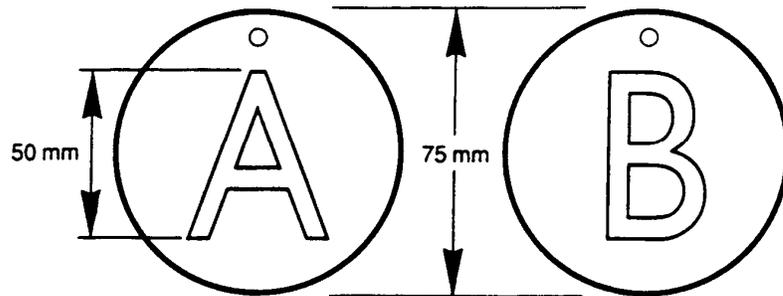


**Personal Line Pouch**

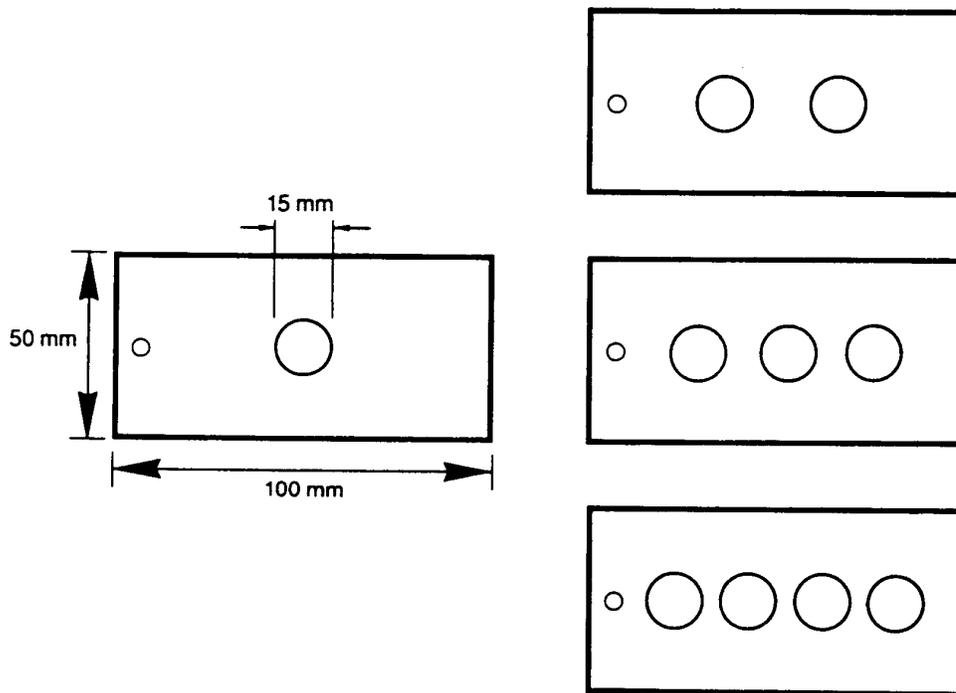
## 49 MAIN GUIDELINE

1. Length 60 metres.
2. Diameter 6mm to 8mm.
3. "Tabs" are fitted in pairs to the line at 2.5 metre intervals along the length of the line. In each pair one of the "tabs" (the tab nearer the payout end) is knotted and is 50mm in length, the second tab is 125mm in length and is un-knotted. The length between the knotted and the un-knotted tab is 150mm.
4. A container is provided into which the guideline is stowed in random fashion.
5. The container is provided with a hole normally in the lid to permit deployment of the guideline.
6. The container is designed to be securely attached to a breathing apparatus wearer or breathing apparatus set.
7. Guidelines are only to be used on the instruction of the officer in charge.
8. Guidelines should be marked when laid out:
  - a. Guideline "A"
  - b. Guideline "B"
9. A Main guideline is provided to enable a team of breathing apparatus wearers in the risk area to retrace their steps to the entry control point and to enable a subsequent team locate them or the scene of operations.
10. Guidelines should always be considered where there are no other means of tracing the way out of the risk area due to conditions within the risk area.
11. Personal lines should always be used when a main guideline has been laid on a route to be travelled separately. This does not preclude their use in other circumstances.
12. A main guideline should always be stowed in such a way that the running end pays out first.
13. Only one main guideline should be run along a single route leading from the entry point to the scene of operations. (This guideline may consist of a number of guidelines joined together).
14. To search off a guideline a personal line may be deployed to the limit of its length. Where the area to be searched is a greater distance from the guideline than the length of a single personal line will permit, a branch line should be used.

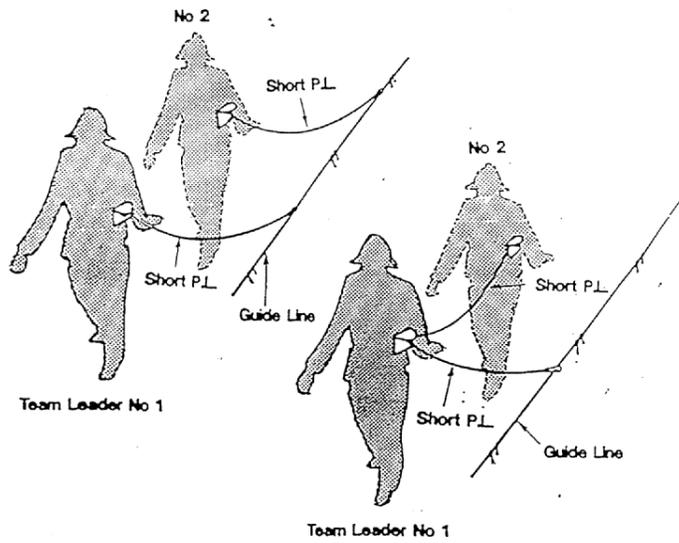
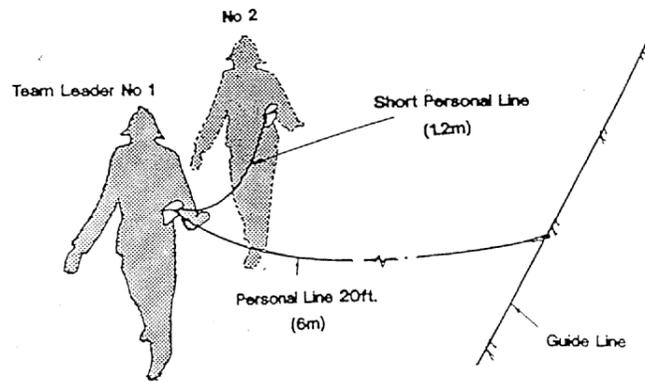
**A MAIN GUIDE LINE  
(2 TALLIES)**



**B BRANCH GUIDE LINE  
(4 TALLIES)**



## PERSONAL LINES



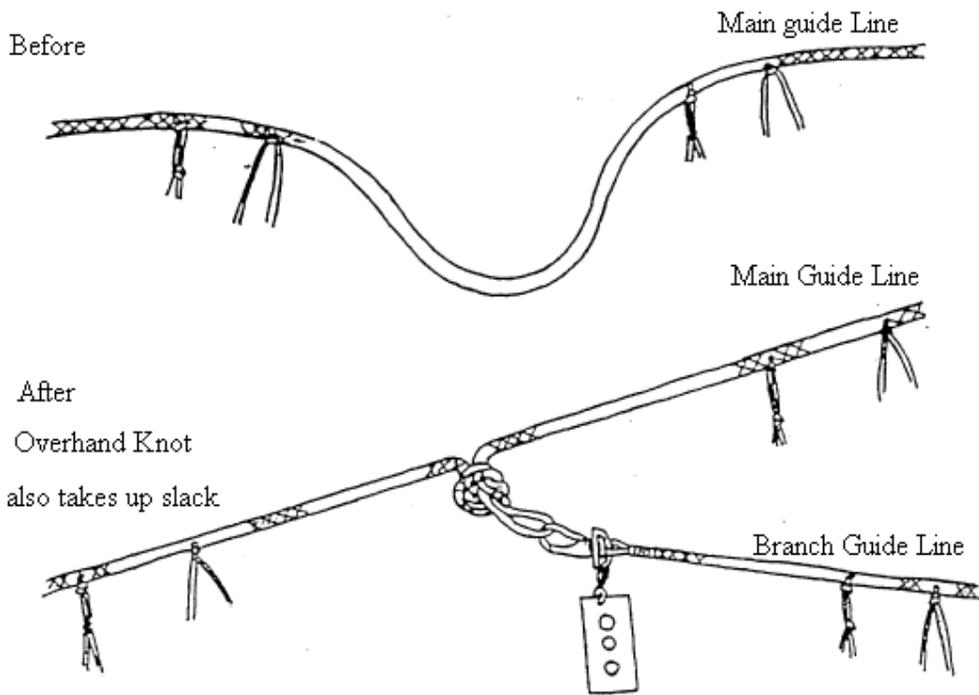
## 50 BRANCH GUIDELINES

1. Branch guidelines are to be used where the distance of the area to be searched from the main guideline is greater than the length of the personal line.
2. There should be no more than four branch lines from any Entry Control point.
3. Branch line tallies are to be designated "1", "2", "3" & "4" by the Entry Control Officer. They are to be marked by the branch line tallies. (The number of holes representing the number of the branch line).
4. Branch line tallies are to be affixed to the branch line by the Entry Control Officer before they are taken into the risk area.
5. Branch guidelines are to be attached to the main guideline securely.
6. Details of main and branch guidelines to which individuals are committed must be recorded on the Entry Control Board.

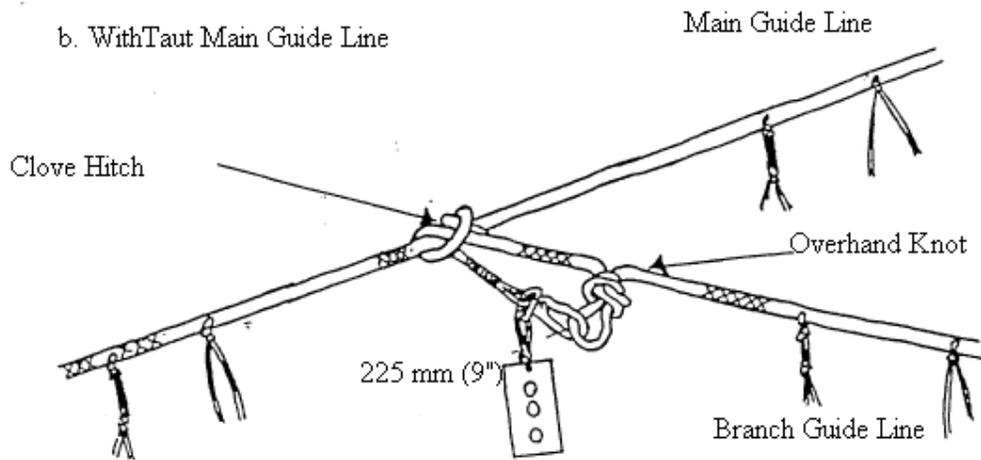
**The Entry Control Officer is responsible for the removal of main and branch line tallies when the lines they are attached to are removed from the risk area.**

## METHODS OF TYING BRANCH GUIDE LINE TO MAIN GUIDE LINE

a. With slack in main guide Line

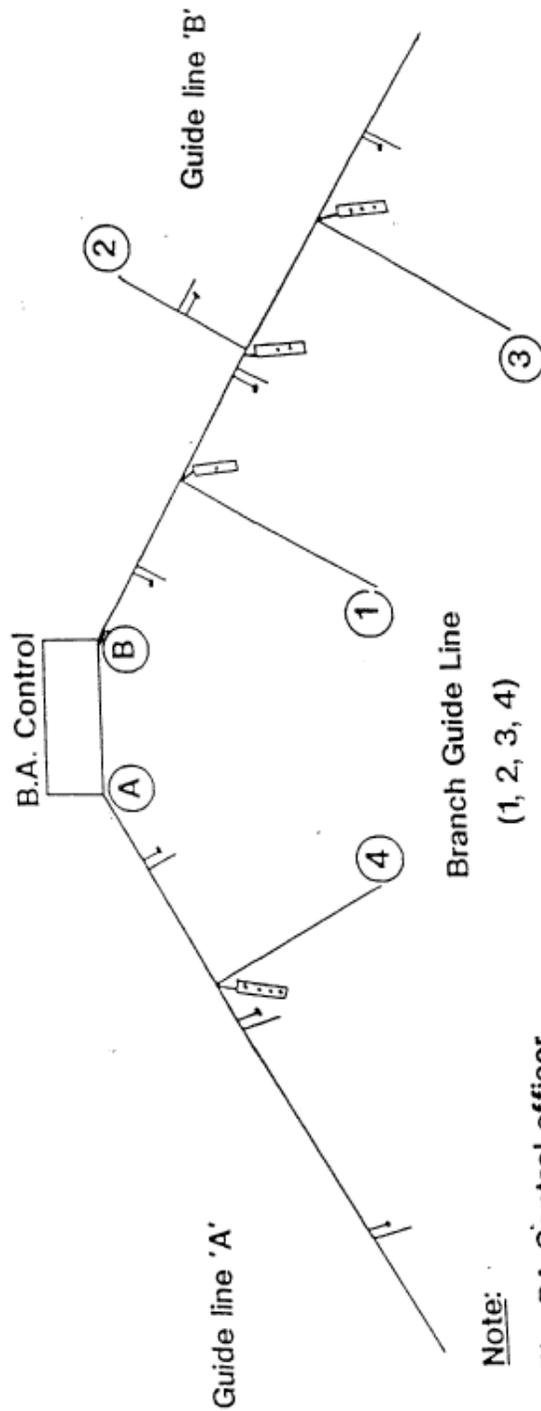


b. With Taut Main Guide Line



With running end of Branch Guide Line a Clove Hitch is tied onto the Main Guide Line a tail of approx 225 mm (9\") clip back onto the loop of the Overhand Knot which is tied in the Branch Guide Line

## GUIDE LINES, BRANCH GUIDE LINES



**Note:**

The BA Control officer is only permitted to have up to 2 main Guide Lines and a total of 4 Branch Guide Lines under his control at any one time.

## **51 PROCEDURE FOR LAYING A MAIN GUIDELINE**

1. The guideline should be secured to the team leader of the nominated team to lay the guideline.
2. Unless the guideline is to be used to extend an existing guideline it is to be secured to a suitable object outside the risk area under the control of the Entry Control Officer and by the Entry Control Officer before the team enters the risk area.
3. Any main or branch line tallies are to be fitted by the Entry Control Officer before the team enters the risk area.
4. The guideline is to be paid out by the team leader or other team member whichever is more convenient.
5. The guideline is to be secured at intervals to a suitable object on the route by other team members of the guideline team between shoulder and waist height.
6. When it is known or expected that penetration may be deep an additional guideline may be carried by another team member.
7. When a team laying a guideline has to withdraw before their objective is reached, the team leader should ensure the container holding the guideline is fastened to a convenient point. So it can be used by another breathing apparatus team that may be sent in to relieve them and carry on with the objective.

**Outgoing teams must always have precedence on the guideline over teams entering the risk area.**

## **52 BREATHING APPARATUS FACEMASK FIT TEST**

### **52.1 Introduction**

BA Instructors should note that this guidance and modified procedures specifically relates to the issue of the 'fit' of BA facemasks and does not address other aspects of BA procedures or command and control.

### **52.2 Face Mask Donning Procedure**

1. This donning procedure is appropriate to all occasions that BA is donned, including training, operational incidents and when taking over a set at the start of a shift or other time as appropriate during general checks.
2. Correct facemask fit is essential if the best possible face seal is to be achieved. The ideal fit is achieved when all straps are tensioned and the chin and temple straps of the mask run in the direction of the mask strap tongues. In order to get the best possible fit the following points should be taken into account:
3. The area around the facemask seal should be free from hair.
4. Loosen all head harness straps, including the centre strap, to their full extent.

5. Place the facemask against the face by sliding it up to ensure that the chin is securely placed in the chin cup. Ensure that hair does not compromise the facemask seal area. This may be more easily achieved if the wearer leans forward whilst fitting the mask.
6. With multiple adjustable straps are fitted adjust the bottom and middle straps progressively and evenly in pairs to ensure that the head harness is 'square' on the back of the head, finishing with the top strap. The fit should be secure and comfortable **but not over tight**.
7. BA wearers should visually check that their partner's head harness is correctly positioned on the head, with the straps in line with the mask tongues and evenly tensioned, before fire hoods and helmets are donned. Repeat steps above if necessary.

### **52.3 Facemask Seal Test**

1. The effective of the facemask seal should be tested on every occasion that BA is donned with the intention of breathing from it.
2. Procedures for testing the facemask seal are as follows;
3. In operational situations these tests should be conducted immediately after the wearer has donned the set and carried out the test of the positive pressure by breaking the facemask seal.
4. Hold breath and turn off the air supply to the mask keeping a hand on the cylinder valve.
5. Observe the pressure gauge for approximately 8 seconds whilst moving the head up and down and side to side. There should be no discernible movement of the pressure gauge.
6. Breath steadily to exhaust the residual air in the system while observing the pressure gauge and noting the activation of the low pressure whistle.
7. When the air is exhausted, gauge shows empty, inhale to cause the mask to collapse onto the face.
8. Hold the breath for approximately 8 seconds to ensure that the facemask remains firmly 'sucked down' onto the face.
9. Turn on the air supply fully and take two or three normal breaths.
10. If a leak is identified during these tests the facemask should be re-fitted with particular attention to correct adjustment of the harness without, however, over tightening the harness.

### **52.4 Positive Pressure Protection**

1. Provided that the BA facemasks are donned correctly and the facemask seal tests are fully applied positive pressure can be expected to provide compensation for any slight mist-match between the face seal and the face during use and will thus ensure adequate protection to the wearer.

2. In the event that a facemask seal leak is identified, despite rigorous application of the above procedures, airports should seek to provide an alternative mask, which provides an adequate fit for the individual. If a suitable alternative mask is not readily available, airports should consult with their BA supplier to seek a suitable modification.

## **52.5 New BA Wearer**

1. For the purpose of this CAAP, new BA wearers are considered to be new employees, personnel returning to operational duties after a significant period of time involved in non-BA duties, personnel whose facial features have altered significantly through weight change dental work or similar.
2. Sufficient training shall be provided to ensure that individuals can apply the facemask donning procedure correctly. Each individual shall then complete the facemask seal test identified in this guidance. All such training shall be recorded in the individual's Personal Training Record.
3. The guidance provided on facemask donning procedures and facemask seal testing should be formally incorporated into your Breathing Apparatus initial, refresher and BA instructor training.

## **53 ADDITIONAL BREATHING APPARATUS INFORMATION**

- 53.1 The role of the Breathing Apparatus Entry Control Officer (BAECO) is essential to the safe control and support of BA operations. The skills and knowledge to carry out the BAECO role in terms of maintaining proper records on the Entry Control Board, communicating with BA teams, and the briefing and de-briefing of BA teams, is an integral part of both BA training and refresher training.
- 53.2 Training for the role of BAECO (to monitor the safety of deployed BA teams within risk areas) should include the limitations of the current calculation of air usage and create the operational understanding that the calculated time of whistle is only for guidance based on the average consumption of air. Whilst BA duration tables were historically based on approximately 40 litres per minute the actual average consumption rates could vary between 40-72% greater than this figure, dependent on work rate and conditions. BA duration tables are not the sole measure of ensuring BA wearer safety, Airport Fire and Rescue Services should consider the use of appropriate air consumption figures in BA training and at operational incidents.
- 53.3 The most appropriate way of ensuring a consistent approach to BA Wearing and Command and Control Procedures at all incidents is to ensure that knowledge of BA procedures is coherent throughout each Airport Fire & Rescue Service. Each Airport is responsible for ensuring that the appropriate policies and procedures are in place to ensure that a level of consistency in relation to BA training and assessment of competence, is maintained and that the policy is delivered.
- 53.4 Initial/refresher training and assessment should be undertaken by personnel who are deemed competent as BA instructors. These instructors should have undergone additional training to

fulfil the particular requirements of the role and been appropriately assessed. The maintenance of competency within the role should be subject to regular assessment and instructors should be required to maintain a portfolio of evidence to enable them to demonstrate the maintenance of their competence. Such co-ordinated training should be in addition to and not replace, effective Station based assessment and training which clearly supports the maintenance of skills.

- 53.5 The wearing of BA is a safety critical control measure in hazardous operations. Therefore, all operational firefighters expected to wear BA as well as those who direct and supervise BA operations need to be able to demonstrate competence in the relevant practices and procedures which they will be expected to undertake within their role. Whilst wearing BA at operational incidents assists in maintaining competence, it may not be in itself considered sufficient to demonstrate continuing competence.
- 53.6 A Maintenance of Competency Scheme (MOCs) is based on the assessment of competence within the workplace, is the recognized framework for ensuring the competence of all firefighting personnel within their role. Due to the broad range of activities and complexities associated with the wearing of Breathing Apparatus, the safety critical implications of the activity and the difficulties of monitoring all aspects of such operations, assessment through simulation will continue to form an important and integral part of ensuring competence within this activity.
- 53.7 The GCAA Fire & Rescue Section recommends that breathing apparatus wearers attend a 2-3 day refresher course at two-yearly intervals, and that any firefighter who has not worn breathing apparatus at a fire during any period of 12 months should have refresher training in heat and smoke.
- 53.8 Complete Breathing Apparatus Set shall consist of the following components:-
1. Backplate, Shoulder harness, and waste belt,
  2. Pressure Reducer, Pneumatic hoses, and Pressure gauge,
  3. Facemask and lung demand valve,
  4. Personal line attached securely to the BA set,
  5. Safety lamp/torch attached to the set,
  6. BA cylinder with cylinder cover.



#### 54 BREATHING APPARATUS MAINTENANCE/BA COMPRESSOR ROOMS

- 54.1 Great care should be taken in the ventilation, dust control and air conditioning of breathing apparatus maintenance rooms. Within the maintenance rooms critical **SAFETY** maintenance will take place and critical **SAFETY** equipment will be stored.
- 54.2 Stringent access control in to this facility should be in place. NO fire-fighting kit is to be worn inside this room. It must remain a clean work room. The washing and servicing of breathing apparatus sets after training or operational use should not be undertaken within the maintenance room.
- 54.3 All records pertaining to maintenance of breathing apparatus shall be securely stored within this room.
- 54.4 A record of all maintenance undertaken should be recorded in the sets records and a BA Maintenance room log book.
- 54.5 Only those persons trained, certificated and competent shall undertake breathing apparatus maintenance. All BA maintenance shall be conducted in accordance with manufactures specifications and requirements.
- 54.6 The compressor room, houses the Breathing Apparatus Compressor which will draw air from within the room and compress it to a pressure of 200/300bars to recharge the breathing apparatus cylinders. The purity of this air is **VITAL** to the Health & Safety of fire-fighters required to wear breathing apparatus.
- Therefore, this room must be controlled to a very high standard, with adequate safety precautions in place.
- 54.7 Air purity testing and compressor maintenance shall be undertaken by a competent person. A record of each cylinder recharged shall be maintained. All composite material cylinders are to be visually inspected before recharging. This inspection shall be recorded.

Air purity test records shall be maintained and be available at all times.

## **55 ABBREVIATIONS**

**AFC = Airport Fire Commander**

**BA = Breathing Apparatus**

**ECO = Entry Control Point**

**DSU = Distress Signal Unit**

**ECO = Entry Control Officer**

**ECB = Entry Control Board**